

Proceedings of the
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(SPARC)
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Proceedings of the Salford Postgraduate Annual Research Conference (SPARC) 2011



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Preface

Postgraduate research is a vital activity at the University of Salford. The Salford Postgraduate Annual Research Conference (SPARC) is a unique event that creates the opportunity for our Salford researchers and other delegates to gain confidence in their research, and to enhance their research skills. SPARC 2011 was a great success. It brought together researchers from multidisciplinary subject areas, to be united in sharing their research aspirations and outputs within a safe and vibrant community and professional research community from at last 18 other UK universities and some international presence. The conference covered broad themes under the umbrella of Arts & Social Sciences, Health & Social Care and Science & Technology. The conference programme was enriched with high profile keynote speakers, training sessions and workshop and interactive sessions chaired by senior academics and researchers. In recognition of research excellence and innovation, SPARC offered a number of awards for best papers and poster presentations.

We hope you will enjoy reading these proceedings which share some of the outputs of research facilitated by SPARC.

Prof. Vian Ahmed

SPARC 2011 Conference Chair

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Allegory and Enlightenment in the Eighteenth Century: the frontispiece to William Blake's "There is no Natural Religion"

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Abstract

In a reading of William Blake's frontispiece to "There is no Natural Religion" that draws largely on the history of the allegorical mode, I offer a narrative that explores the creative ways in which Blake illuminated his ideas about the value of Enlightenment thought.

Keywords

Allegory, Blake, Education, Enlightenment, Illustration.

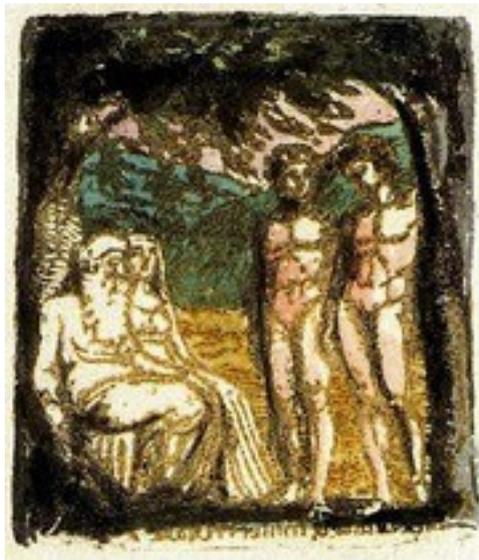


Fig. 1. William Blake, frontispiece from "There is no Natural Religion" (c. 1788).

In his first illuminated book, "There is no Natural Religion," William Blake adopted the personifying practises of the allegorical mode not as a reaction to but as the natural outcome of his desire to expound Enlightenment educational ideals. This work was originally produced in c. 1788 and continued to be printed by the engraver for many years: in fact, Blake celebrated the work over thirty years later as his "Original Stereotype" (1822, p. 272). Blake's clear recognition of "No Natural Religion" as an important work in his illuminated oeuvre has not, however, generated an appropriate response from Blake scholars, the majority of whom have hastily described the engraved plates from "No Natural Religion" as little more than what S. Foster Damon referred to as "the smallest as well as the first examples of Blake's illuminated printing" (1924, p. 36)—a fleeting assessment which would later be repeated in the highly influential monographs of Northrop Frye (1947) and David V. Erdman (1954). This paper aims to offer a reassessment of "No Natural Religion" which will contribute to the long over-due repositioning of this work as a defining text in Blake's catalogue by investigating why Blake believed that "No Natural Religion" was the foundation upon which his subsequent prophecies were built.

I will initiate this investigation by analysing the specifically allegorical nature of the figures which appear in the frontispiece of “No Natural Religion” [Fig. 1]. In this frontispiece, Blake presented his readers with the image of an elderly couple who were seated in the shade of an overhanging tree. To the right of this couple stood two men, both of whom were unclothed. In order to analyse the allegorical contents of this illumination, we must first learn how an eighteenth-century artist would have understood and consequently adopted allegory. We can do so by looking at contemporaneous pieces of literary criticism that investigated the practical functions of the allegorical mode. This study will reveal the dominant conventions of allegory during this period, allowing us to produce a relevant methodology that will help us to decode the allegorical contents of Blake's frontispiece.

1. Allegory in the Eighteenth Century: the literal and the mythical

The eighteenth century is often identified as a period that was antithetical to allegory. However, throughout this period writers made effective, innovative use of allegory, as works as diverse as James Thomson's *The Castle of Indolence* (1748) and Tobias Smollett's *The Expedition of Humphrey Clinker* (1771) demonstrate. Accordingly, eighteenth-century literary criticism frequently investigated the recurrent methods of this popular tradition. John Hughes, in his “Essay on Allegorical Poetry” (1715), wrote:

An Allegory is a fable . . . in which, under imaginary persons or things, is shadowed some real action or instructive moral . . . it is that 'in which one thing is related, and another thing is understood.' It is a kind of hieroglyphick, which, by its apt resemblance, conveys instruction to the mind by an analogy to the senses, the literal and the mythical: the literal sense is a dream or vision, of which the mythical sense is the true meaning or interpretation. (p. xxi)

Hughes argued that an allegorical work must necessarily contain two levels of signification. The first level of signification, which Hughes called the “literal sense,” was any superficial reading of a work that was purely deduced from the material surface of the page. The second, “mythical” level of signification, on the other hand, was an interpretation of the literal work that had been informed by external factors. A reader of allegory was therefore expected to unravel the symbolic contents of an allegorical work by discovering the resemblances between its superficial literal signifiers and its suggested mythical signifieds.

The discovery of each level of signification in Blake's frontispiece may prove difficult for a twenty-first century reader. This is because, as Roland Barthes argues in “The Photographic Message” (1977), each historical era harbours its own “period rhetoric.” This rhetoric is constituted of a “stock of stereotypes (schemes, colours, graphisms, gestures, expressions, [or] arrangements of elements)” that exist before and during a work's composition (p. 18). These elements prompt contemporaneous readers of a work to immediately recognize the familiar, literal significations of the text, after which they are expected—via subsequent reflection and contextual comparison—to identify the underlying mythical significations of the allegory. In order to apply Hughes's interpretive methodology to Blake's frontispiece, then, we must first fabricate the contextual conditions of an eighteenth-century reading by looking at other contemporaneous works that contained similar signifiers. This comparative study will help us to accurately interpret the literal and mythical significations of the frontispiece according to the cultural rhetoric of the eighteenth century. I will begin this investigation by addressing the immediate, literal significations of the frontispiece, uncovering how an

eighteenth-century reader would have originally interpreted the print prior to their later allegorical analysis.

2. Angelic Instruction: the literal significations of “No Natural Religion”



Fig. 2. William Blake after Raphael, *Abraham and the Three Angels* from *The Protestants Family Bible* (1781), detail.

Several illustrations in contemporaneous texts contained the same literal signifiers as those seen in Blake's frontispiece. For instance, in *The Protestants Family Bible* (1781) [Fig. 2], eighteenth-century readers were exposed to the image of an elderly man who was seated on the ground, to the left of which stood a group of men. This print, engraved by Blake, was a reproduction of Raphael's *Abraham and the Three Angels* (1517). The signifiers contained in Raphael's popular piece—the elderly man seated on a low level and the group of men stood on a high level—were all reproduced in “No Natural Religion.”

It is therefore likely that the literal level of signification in Blake's frontispiece depicted a similar scene of angelic visitation. This is because its primary signifiers, as Barthes notes, “refer to clear, familiar signifieds” (pp. 22-23). These significations are “familiar” and therefore literal due to their inception in the Bible and their subsequent reproduction in both religious scripture and art from the beginnings of antiquity to contemporary times. Indeed, the signifiers used by Blake in the frontispiece to “No Natural Religion” were frequently employed by artists throughout the seventeenth and eighteenth centuries to depict scenes of angelic visitation. Investigating the Biblical contexts of these continually replicated literal signifiers can help us to formulate an accurate idea of how Blake would have expected eighteenth-century readers to react to and initially interpret the frontispiece to “No Natural Religion.” Moreover, by tracing the gradual evolution of religious and philosophical treatises that examined the same subject between the seventeenth and eighteenth centuries, we can uncover the allegory's hidden tier of enlightened, mythical signification that readers would have only identified upon subsequent reflection.

The literal signifiers in Blake's frontispiece originated in the Bible. Due to the similar signifiers used in both Blake's and Raphael's works, we can assume that the opening plate from “No Natural Religion” was intended to invoke the story of Abraham in the mind of the reader. In this story, as related in Genesis, the usually bearded Abraham was found resting “in

the plains of Mam-re” with his wife, Sarah. “Lift[ing] up his eyes,” Abraham realised that “three men stood by him: and when he saw *them*, he ran to meet them” (18:1-2). Upon reaching the group, Abraham “bowed himself toward the ground” and said to the three men, “rest yourselves under the tree” (18:2-3). The arrangement of the literal signifiers in Blake’s frontispiece has now been achieved: the angelic men are standing beneath the tree and Abraham and his wife are seated “toward the ground.”

This pictorial structure was representative of the hierarchical relationship between the angels and humanity. Dionysius, in *The Celestial Hierarchies* (c. fifth century), argued that “the Word of God has given our [human] hierarchy into . . . the direct guidance of Angels” (p. 35). Therefore, because God had attributed the governance of humanity to the angels, the former were lower on the celestial chain than the latter. This hierarchy was usually depicted in visual art via the implementation of Jacob’s Ladder. Accordingly, in an early seventeenth-century engraving by Theodore Galle [Fig. 3], audiences were exposed to the image of “a ladder set up on the earth, and the top of it reached to heaven; and behold, the angels of God were ascending and descending on it” (Genesis 28: 10). At the bottom of this ladder sat the bearded Jacob. The angels were therefore pictured on a high level while the bearded prophet was positioned on a low level. This pictorial arrangement assumed the same visual structure as the frontispiece to “No Natural Religion.”



Fig. 3. Theodore Galle, “Mater Sanctae Spei” from *Pancarpium Marianum* (1618), detail.

The practical function of this visual hierarchy was revealed in Abraham’s story. Once the above structural arrangement had been achieved, the visitors began to relay a divine message to their hosts, saying: “Sarah thy wife shall have a son” (18:9-10). What is of interest here is not the contents of the message; rather, it is how a standing group of individuals have imparted a previously unknown piece of informative knowledge to a seated audience. Brian E. Colless, in “Divine Education,” argues that angelic messages such as those described in Genesis and Enoch are instances of what he calls divine education. Colless writes: “in the Bible . . . God is represented as giving instruction on the basis of a set programme of education . . . which was implemented with the help of specially selected teaching assistants” (1970, p. 140). These teaching assistants are the angels.

This perspective of angelic tuition was dominant until the latter half of the seventeenth century. Indeed, throughout this period we see angels described as instructive figures in religious treatises and pictured as such in illustrations. For example, John Salkeld, in *A Treatise of Angels* (1613), argued that the function of angels was to “aide, assist, illuminate, and stirre” humanity “up to all good and vertue” (p. 319). Furthermore, in Thomas Heywood’s *The Hierarchie of the Blessed Angells* (1635), readers learned of how angels

. . . were from Heav'n downe sent
With full Commision to have government
Or'e all Mankinde; not onely to conduct them,
In their affaires, but tutor and instruct them:
With these [lessons], never to incline
Either to *kill*, *Judge rashly*, or *Drinke Wine*. (p. 289)

The instructional function of angels was also used for a practical purpose in seventeenth-century emblem books. The writers and designers of these illustrated works—which were often used as tools of instruction throughout the period frequently employed the services of angels in order to inherit the tested, instructive significations of these creatures. For instance, in Otto van Veen's *Amoris Divini Emblemata* (1615), readers followed the growth of a young angel who was being educated by an adult tutor of the same species. Similarly, in Francis Quarles's *Emblems* (1635), readers saw images of a winged individual assisting unfortunate youths in a variety of instructive scenarios [Fig. 4]. As a result of these written and pictorial depictions of angelic tutors, there is no doubt that a seventeenth-century reader would have been familiar with the literal significations of Blake's frontispiece. Can the same be said of an eighteenth-century reader?



Fig. 4. Francis Quarles, “Ah, Treach'rous Soul!” from *Emblems* (1635).

In short, yes. While the production of new angelic works did decrease during the first half of the eighteenth century, certain theological seventeenth-century works continued to be reprinted and remained popular throughout the period. Examples of these persistent works include the following: Quarles's angelic book of *Emblems* (1635), which was republished regularly during the eighteenth century; Isaac Ambrose's *War with Devils: Ministration of, and Communion with Angels* (1674), which similarly continued to be printed well into and throughout the following century; and, of course, John Milton's *Paradise Lost* (1667), whose popularity remained unquestioned. The illustrated contents of Bibles also remained unchanged [Fig. 5]. They continued to be adorned with angelic prints that contained the same literal signifiers as those found in Blake's frontispiece. Therefore, because numerous contemporaneous works contained the same signifiers as those seen in “No Natural

Religion,” it is highly probable that an eighteenth-century reader would—as a result of contextual comparison and of association—have initially interpreted the content of Blake's print as a typical instance of an angelic visitation.



Fig. 5. “St. Matthew” from *The Sacred Chronicle or, a Compendious History of the Holy Bible* (1731).

This early reception of “No Natural Religion” should be categorized as the allegory's immediate, literal level of signification because of the superficial nature of its interpretation. However, as we learned from Hughes's allegorical methodology earlier, the literal level of signification in an allegory is “designed only to clothe and adorn” the mythical level of signification, “not to hide it” (p. xxxv). Eighteenth-century readers were therefore expected to de-robe the literal significations of Blake's work by reflecting upon the potential moral of the pictorial allegory. Hughes argued that this act, achieved through an internal process of “resemblance” and “analogy,” would reveal the “mythical sense” or “true meaning” of the work (p. xxi). In order to uncover the mythical level of signification in “No Natural Religion,” then, we must first locate any external texts that contained the same angelic signifiers as those seen in Blake's frontispiece. We can do so by comparing the contents of “No Natural Religion” with the instructional illustrations that accompanied contemporaneous children's literature.

3. Enlightened Education: the mythical significations of “No Natural Religion”

The dominant aim of eighteenth-century children's literature was to instruct the young. Juvenile fiction was accordingly adorned with illustrations that sought to render the often difficult process of education as a delightful experience. Thus, in works such as Lady Ellenor Fenn's *Cobwebs to Catch Flies* (1783) and John Marshall's *Goody Goosecap* (1788) [Fig. 6], readers observed scenes of instruction that were carried out by loving, patient parents. The figurative arrangement of these images—with the parent stood above the child—mimicked the fundamental hierarchical arrangement of an angelic visitation regardless of no angels actually being present. The pictorial arrangement of angelic signifiers had therefore, at some point over the last century or so, began to produce a standalone system of signification that had

shed its religious context while maintaining its educative function. In other words, the pictorial arrangement of the individuals in a scene of angelic visitation—with the messengers on a high level and the prophets on a low level—was now being used in an alternative but equally instructive context by the writers of secular works.



Fig. 6. John Marshall, *Goody Goosecap* (1788).

Upon noticing this parallel, a contemporaneous reader of “No Natural Religion”—realising the hastiness of their previous literal interpretation—would have subsequently categorized the frontispiece according to its mythical level of signification, identifying the pictured scene as an instance of secular rather than angelic instruction. Investigating how this secular form of instructional illustration manifested in children's literature can help us to understand why Blake inserted this second tier of mythical signification into his angelic allegory. We can do so by tracing the gradual evolution of instructional works between the seventeenth and eighteenth centuries, identifying when and why human tutors began to be substituted for angelic messengers.

Mankind's corporeal ascent up Jacob's Ladder was the result of a slow but steady development in works of private pedagogy, the seeds of which can be seen in the sixteenth- and early seventeenth-century works of Michel de Montaigne and Obadiah Walker. However, these advancements in education would fail to infiltrate instructive illustrations until the latter years of the seventeenth century, when secular in contrast to religious treatises on education started to become common rather than sporadic. These pioneering works focussed primarily on how a tutor should guide a pupil to enlightenment. This aim consequently caused the subjects that a tutor should teach such as scripture and conduct in church to become secondary. An example of a writer who supported this type of guided instruction is John Locke. This influential philosopher successfully assimilated the underlying secular feelings of the seventeenth century by incorporating and then advancing the ideas of prior educationalists, doing so in numerous treatises and essays on the subject of instruction.

The result of this pedagogical advancement is best seen in Locke's *Two Treatises of Civil Government* (1690). In this work, Locke presented a secular argument which undermined the divine attributes that had often been associated with tutors. He did so by arguing against the outdated but popular notion of paternal authority, which advocated the supposed divinity of two types of tutors: namely, fathers and kings, each of whom had “an absolute . . . power over the lives . . . and estates of [their] children or subjects . . . they being all his slaves” (p. 9). These divine tutors were thought to be “so high above all earthly and human things” that they assumed a similar but certainly more tyrannical role to angelic messengers (p. 5). Locke

refuted these paternal claims to divinity by examining the nature of the first appointed King, Adam, whose direct correspondence with God had supposedly established the divine right of humanity's paternal bloodline:

The [divine] law that was to govern Adam was the same that was to govern all his posterity . . . But his offspring having another way of entrance into the world, different from his, by a natural birth, . . . were not presently under that law. For nobody can be under a law that is not promulgated to him. (p. 143)

This supposition had two implications: first of all, that Adam's bloodline, composed of children who were born by natural means, did not consist of any divine attributes, thus rendering paternal authority void; and second, that humans—all of whom were born equal—were therefore subject to natural in contrast to divine laws. These implications prompted an increasing number of individuals to question the truth behind any claims of divinity, paternal or otherwise. The knock-on effect of this uneasiness was an open refutation of angels, who were quickly becoming classified as an object of superstition during the early years of the eighteenth century. Their pedagogical position as the governors of humanity consequently required a sublunary replacement.

This role was fulfilled by distinctly human tutors. The necessary attributes of these tutors, detailed by Locke in *Some Thoughts Concerning Education* (1693), included the following: “a good mind, well-principled, tempered to virtue and usefulness, and adorned with civility and good breeding” (p. 107). These parental qualities—which could be found in a father, a mother, or an appointed governor—were by no means divine. The primary aim of these unbiased tutors was to “teach his scholar . . . to make . . . a true judgement of men,” which included the ability to identify the “many, who have not strength and clearness of thought to distinguish between” religious “superstition” and a “true” humanitarian “notion of God”—the latter of which painted God as a natural force rather than as a tyrannical ruler (p. 123). Locke's brand of education was therefore founded on secular principles and not on oppressive conceptions of divine obedience.



Fig. 7. John Gay, “Introduction” from *Fables* (1733).

This supposition prompted a large reaction in the new educational works of the eighteenth century. Further, when combined with Locke's later recommendations of instruction via delightful pictures, secular illustrations in children's books soon became a normality. Images in children's literature now began to depict scenes of instruction that did not include the presence of an angel or the invocation of a paternal divinity; rather, secular prints now portrayed a form of education that was administrated by distinctly human parents or by enlightened tutors. These illustrations did, however, maintain the typical hierarchical arrangement of an angelic visitation in order to inherit the instructional significations of this publicly recognisable structure. Examples of these secular scenes occurred in John Gay's *Fables* (1733) [Fig. 7] and John Newbery's *A Pretty Little Pocket-Book* (1744), each of which placed the tutor on a high level and the pupil on a low level. A further example of an eighteenth-century work that adopted this pictorial arrangement was none other than the frontispiece to Blake's "No Natural Religion."

4. Angelic Instruction or Enlightened Education?: combining the literal and mythical significations of "No Natural Religion"

In short, then, a contemporaneous reader of "No Natural Religion" would have identified two levels of sequential signification in Blake's frontispiece. This reader would have initially distinguished the work's literal level of signification—which identified the scene as an instance of angelic visitation—because of the image's contemporaneous resonance in Biblical prints and religious documents. The reader would then have reflected upon the specific attributes of this immediate interpretation by searching for further pictorial echoes in contemporaneous works. This contextual interrogation would have subsequently resulted in the reader noting a visual comparison between Blake's frontispiece and the illustrations that adorned contemporaneous children's literature, prompting them to re-interpret Blake's illumination according to its previously unidentified level of mythical signification. It is this recognition that would have resulted in the reader uncovering what Hughes had referred to as the "true meaning" (p. xxi) of Blake's allegorical frontispiece: specifically, that the designer of this image, "The Author & Printer W Blake" (1788, p. 2), believed that human tutors were endowed with the same peculiar attributes which had resulted in the religious adoration of angelic instructors because these corporeal teachers—regardless of their sublunary in contrast to divine heritage—possessed an exclusive ability to raise "other men into a perception of the infinite" (1790, p. 39). It is this ability that inspired Blake to use the instructional methods of the allegorical mode to literally simulate the pictured act of instruction, transforming himself into an enlightened tutor and "No Natural Religion" into a practical rather than passive piece of art that illuminated his ideas about the value of a guided, secular education.

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“Not Supposed to be Human if you’re a Teacher” – Ideological Shift and the British Post-War School Novel

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Abstract

Taking as a starting point Spolton’s 1963 article “The Secondary School in Post-War Fiction”, this paper seeks to unpack potential reasons for the post-war boom in school-based novels by focusing on two novels in particular, BS Johnson’s *Albert Angelo* and Anthony Burgess’ *The Worm and The Ring*. Identifying key political and economic factors surrounding education such as the 1944 Education Act and increased state funding, it is possible to outline the historical situation from which these novels arise. This background can then be traced through the authors’ own biographies and the contemporary educational policies, into the works themselves.

By utilising an Althusserian approach, it can be seen how the changes occurring within the historical situation result in corresponding ideological tensions that, in turn, inform the narrative tensions existent within these novels. As writers, Johnson and Burgess were expressing the concerns that they felt as teachers. Whether it be the future of “democracy” and “civilisation”, the “inhuman” teachers whose role it is to enforce such things, or the “savage” children needing to be brought into line – these novels provide a multitude of perspectives on the nature of schooling relevant both historically and contemporarily.

Keywords

Education, Post-War Novel, Burgess, Johnson, Ideology

In the 1963 article “The Secondary School in Post-War Fiction” L. Spolton makes the claim that “the post-war period is noteworthy for its proliferation of...many full-length books in which the school is not merely an interlude but forms the major or sole part” (125). Substantiating this claim, Spolton outlines a significantly large number of books published in this era from both famous writers and relative unknowns. The reasons for this sudden boom in school novels are left reasonably ambiguous; with only a passing allusion to the 1944 Education Act, for example. By situating the content of these novels within their historical moment it may be possible to further tease out these reasons and increase our understanding of this trend.

In order to unpack the contents of the school-novel it is of necessity that I concentrate on far fewer texts than Spolton. The two central texts being Anthony Burgess’ *The Worm and The Ring* and BS Johnson’s *Albert Angelo*. This first of these, *The Worm and The Ring*, appears in Spolton’s article as, notably, “The school is moving into new buildings, which, it transpires, are to be the first part of a large new comprehensive school”; something Spolton points out as “probably the first to be the topic of fiction” (135). This literary first aside, the novel is also both incredibly useful and problematic in terms of tracking the development of the school and its representation in the novel. Ostensibly set in the 1950s, *The Worm and The Ring* was not published until 1961. The threat of a libel case saw the novel recalled by Heinemann and only revised and reissued by Roland Gant in 1970. As a cultural artefact, Burgess’ novel thus manages to touch three decades of educational development, the story itself apparently undergoing numerous changes throughout this time.

The second of these texts, *Albert Angelo*, published in 1964, was thus not listed in Spolton's exhaustive article. With formal innovations such as "a rectangular hole cut through two of the recto pages...so that the reader can see through to a future event" (Coe 2004, : 18) and a fourth-wall-busting conclusion in which we are told that "telling stories is telling lies" (Johnson, 2004: 167), this novel can be considered far more "experimental" than Burgess'. It is these very innovations that lend *Albert Angelo* so well to cultural analysis. The use of dual columned writing and clippings from students' work all contribute to the invocation of a multiplicity of voices. Published and seemingly set in 1964, *Albert Angelo* provides a contextual counterpoint to *The Worm and The Ring* and yet, where it differs in terms of form, the situations described are uncannily similar.

Before approaching these texts directly, however, it is worth taking a brief moment to map the changes taking place within education during the historical moment with which these novels are concerned. In *A Hundred Years of Education*, A.D.C. Peterson describes the "rapid growth of numbers in full time education" that took place during the late 1950s and 1960s, that brought with it a large increase in "educational expenditure as a proportion of the gross national profit" (8). As a percentage of GDP, educational expenditure went "up from 3.2 per cent in 1954 to 5.1 per cent in 1964" (261) and, at the time of the book's publication in 1971, it is predicted to be "probably more than 6 percent" (261). Attributable to increased economic prosperity and development when viewed in Peterson's terms, the fundamental factor in this growth can nevertheless be found in the 1944 Education Act.

The 1944 Education Act significantly restructured the British education system and, vitally, introduced free secondary education for all. Prior to this act, secondary education was funded by the pupil and, as a result, many left education early. With the removal of fees came the compulsory school leaving age of 15, to be brought up to 16 when practical. The vast number of new pupils that the 1944 Act would thus create clearly called for a rapid expansion of the education sector. The large comprehensive school that makes its first fictional appearance in *The Worm and The Ring* is an indicator of this chain of developments. Alongside the increased fiscal responsibility that the state took in the promotion of education, as witnessed in the percentage of GDP, there was similarly an increased responsibility taken in terms of directing the content of education. The Central Advisory Councils initiated by the Education Act are described by Peterson as "the first time an official body in England...might take the initiative in 'supervising' [sic] the content of education" (61) through the establishment of a national syllabus. Increased participation and centralisation, the hallmarks of an expanding welfare state, provide the situation from which this explosion of school-novels is seen to spring – yet it is not entirely positive. Kogan, writing in 1975, evokes the moment in 1960 "when the Opportunity State was at its noon tide" with a grim fatalism foreseeing the moment when "social and economic relationships are under attack if not in danger of dissolution" (26). It's a tone of systemic fragility and conservative regret that emerges in both of the texts we're concerned with. These storylines all rely on the expanding education system for their tension; characters attempting with varying shades of enthusiasm to solidify their place within a system that has not yet solidified itself.

Both writers being known for their use of autobiographical experiences as material for their works, it is worth taking a moment to situate Johnson and Burgess biographically in relation to this historical context. In Jonathan Coe's biography of Johnson, *Like a Fiery Elephant*, he describes how Johnson applied "in January 1960...to work as a supply teacher inside the state system and within a matter of days found himself employed by Surrey County Council" (92). Coe categorises this as "typical of the hand-to-mouth existence [Johnson] had to cope with for the next three years" (92). These descriptions clearly imply a sense of desperation rather than actual enthusiasm on both Johnson's side and the side of Surrey County Council. Such an implication, whilst highly suited to the character of Albert in *Albert Angelo*, would seem

to contradict Johnson's reputed concerns at this time. "The public platform which the classroom provided," writes Coe, "was always going to inspire a crisis of conscience over what he should be telling his pupils" (175). Concerns regarding the content and practice of teaching within the comprehensive system are implicit within many of Johnson's other works during this period. For example, Johnson's short film *You're Human Like the Rest of Them* features a teacher railing against his students for denying the grim realities of death through their inability to take life seriously. A bleak message, but one delivered with the strong anti-establishment undertone concerned about the systemised regulation of children.

Anthony Burgess' personal experience of teaching, growing out of his wartime role in the Educational Corps, is marked by many of the same concerns affecting Johnson. "Offered the post of English master on 21 June 1950" at Banbury Grammar School, Andrew Biswell's biography points out that at "thirty-three years old...this was [Burgess'] first permanent job" (123). In an interview conducted with the school magazine in 1952 Burgess was asked if he would advise any of his students to become teachers, replying, "Only those I dislike" (Biswell: 126). A typical Burgess witticism, this seems to point less to the kind of disillusionment suffered by Howarth in *The Worm and The Ring* and more towards the forever decreasing wages being paid to teachers within the expanding education system. In a time of general economic prosperity and growth, such a devaluation represented for Burgess "part of a wider government conspiracy against the intelligentsia" (Biswell: 145). Again, as with Johnson, an uncomfortable relationship is drawn between the centralising operations of the state and the role of the individual teacher, something of keen interest to the competing educational theories being explored at the time.

In *Educational Policy Making*, Maurice Kogan categorises the broad shift in educational theorising as a movement away from a psychology-dominated approach toward a theory of social environment. "From the 1920s to the early 1950s" marks the period when "the psychologists were in power" (1975, 40). This psychological approach, according to Salter and Tapper, makes it seem "as if the patterns of success and failure are natural" as "the individual himself...appears to choose to fail or succeed" (22). The student is regarded along liberal lines; as a free individual whose personal autonomy guarantees them a measure of success in balance with their expended efforts and natural ability. From "the early 1950s to the end of the 1960s", Kogan writes, this theory is falling out of favour to be replaced by "the period when the environmentalists took over" (40). It is during this transitional period that we see Burgess setting *The Worm and The Ring*, and it is the collapse of these liberal values that is mirrored in the character of Woolton.

Within the novel Woolton, the headmaster of the school, is effectively forced to step down from his office through a campaign of public pressure instigated by Gardner, his power-hungry rival. The overwhelming tenor with which Burgess presents Woolton's withdrawal is a lament for the dehumanising process that the increasing systemisation of education seems to embody. "A human being is out of place in a governor's seat", Woolton declares, a role in which "the first task of the governor is not to govern, but to exist" (1970: 249) and the ideal candidate is "the man born to rule" (272). It follows that this new form of governor must be "neither the good man nor the bad, but the man capable of existing as a sheer function, a sheer personification of order" (272). On a personal level, the implementation of rigid hierarchical structures within the educational system is decried as a "stripping away from the ruler's personality of those very attributes which it is the ambition of the civilised man to achieve" (252). Indeed, the fall of Woolton, considered on the epic scale that the novel's Wagnerian title would suggest, represents the end of the cultivated and cultured educator whose high ideals are to be sacrificed on the altar of educational efficiency.

The ideological implications of Woolton's lament become clear if we return to Spolton's categorisation of the novel as the first to feature a comprehensive school. The series of new

“comprehensive school” buildings that threaten to engulf the old “grammar school” buildings in which the novel is set have more than just architectural implications. With the ever-expanding education system comes the demand for an increase in regulation and organisation. The “personality” of “the civilised man” is not merely unnecessary, but is at total odds with the maintenance of “order” through “sheer function” that new educational theory and practice demands. This “environmentalist” theory, Hoggart writes, is premised on the notion that “we do not have an educational system: we have an education-and-class system, and that’s very different” (45). The large new comprehensive school in *The Worm and The Ring* is bringing with it the new cultural idea that “children from some kinds of home...are regarded as cut off from certain essential social and linguistic experiences and so [are put] at an educational disadvantage” (Hoggart: 31). In treating each student equally, the *laissez faire* liberalism of Woolton makes no recognition of the inequality present in his students’ backgrounds.

Similar tensions regarding theory and practice appear in *Albert Angelo*. Set later in time than Burgess’ novel and in a struggling inner-city school rather than *The Worm and The Ring*’s somewhat idyllic countryside Grammar School, the teachers of *Albert Angelo* still often appear high-minded to a farcical level. “I buy pop records”, remarks a teacher called Scott, “for sociological reasons” (105). Yet it’s the remarks of one pupil that seem most to capture the “environmentalist” theory. The note is included with a number of others written seemingly by Albert’s class. “We should be compeled to wire uniform” it reads, and “we smash the school up because the teachers are not stricht” (122). Rather than be treated as an autonomous individual, this student welcomes the rigid functionality that *The Worm and The Ring* portrays as potentially dehumanising. Rather than dehumanising, however, the student in *Albert Angelo* recognises that it is through this socially levelling operational model that education can inculcate a stronger sense of order that, theoretically, results in a better education for all. The demand for “stricht” teachers demonstrates this student recognising their right to education; a right only formally recognised by the government in the 1944 Education Act.

The widespread recognition of a universal right to education at this historical moment is evinced by Raymond Williams’ 1961 book, *The Long Revolution*. Here he writes confidently that Britain has now accepted the notion “that all members of the society have a natural right to be educated and that any good society depends on governments accepting this principle as duty” (165). Steeped in the language of democratic socialism, Williams’ conviction at this historical moment is that the welfare state has crystallised within the national ideology to the point of universal acceptance. We see a similar position taken by the Director in *The Worm and The Ring* when he declares that “we are truly justifiably proud of what we have done in the field of education – its almost complete democratisation” (83). In fact, this speech goes even further in presenting a vision of “an even greater egalitarianism” in which teachers “cease to laud the bookworm...above the good steady child” (83). Not only do we see here an acceptance of democratised education, but an enthusiasm for its future that could only possibly be built on an unshakable confidence in present developments.

Scattered amongst these utopian proclamations, however, we can find intimations of the actual root from which the democratic socialist ideology grows. The Director’s schools of the future will be “the best that money can buy”, aimed at raising children for “the rough world of practical endeavour” (83). The forecast is not so much about a “long revolution” in consciousness, but rather predicts endless economic growth in which government expenditure is provided for by the forever increasing and expanding skill-base of its citizens. Education here appears as a nodal point around which new economic potentials can gather into an ideology; as Salter and Tapper write, “ideologies in ferment are inevitably the harbingers of

educational change” (54). By the 1970s, with the economic rug pulled from under it, much of this glassy-eyed humanism collapses under the weight of its own presumptions.

Such a faith in the system cannot in any way be attributed to Johnson. In the “Disintegration” section of *Albert Angelo*, where an authorial voice breaks through the narrative and appears to speak directly to the reader, it describes the novel as “didactic” (176). The Johnson-character points out that “if the government wanted better education it could be provided easily enough” and their perceived reluctance to do so forces him to conclude that “they specifically want the majority of children to be only partially educated” (176). The political power-structure as it appears in *Albert Angelo* is centred in the state and upheld through the economic dependence of the schools. This perspective is present even within the descriptions of teaching’s pragmatics. Where *The Worm and The Ring* describes the German teacher Howarth ruminating on Luther’s theological implications before a rapt class, *Albert Angelo* describes the “sheer bloody repetition of teaching” (84) and the “perpetual nagging. Ninety percent of teaching is nagging” (74). But it’s here, whilst Albert considers that, “Once I’ve learnt something I want to go on, I want to build on it, not go on repeating it” (84), where we capture some of the true essence of teaching as a job, a role, and not as an idea. Knowledge, and the ambition towards attaining it, is conspicuously missing from the world of education as presented by Johnson.

In presenting education as a routine perpetuated by an organ of the state, Johnson’s outlook shares many of the positions held by the philosopher Louis Althusser. For Althusser “the school...teaches ‘know-how’, but in forms which ensure subjection to the ruling ideology or the mastery of its ‘practice’” (2008: 7). Althusser’s Marxist critique of ideology, set out in *For Marx*, revolves around how “political practice...transforms its raw materials: social relations, into a determinate product (new social relations)” (167). In the case of education, this takes the form of “the reproduction of labour power [that] requires not only a reproduction of its skills, but also, at the same time, a reproduction of its submission to the rules of the established order” (2008: 6). In maintaining the capitalist system it is necessary that “knowledge” is formulated into the ideological conception of “skills”. Within the definition of these “skills” is embedded their practical application; ideologically, knowledge becomes inseparable from its economic utility and is thus formulated as a means of production.

If we consider ideology from this perspective, we can now return to the theoretical debates presented in *The Worm and The Ring* and consider them according to this economic principle. The democratic socialist stance, with its allegiances to the “environmentalist” theories previously described, is envisioned by the character of Gardner as “the final and finest flower of the welfare state” (270). His utopian vision seeks the material outcome of “a skyscraper school with lifts to all floors, our own broadcasting system...a library with a large full-time staff, a couple of cinemas, a daily newspaper and weekly magazine” (269), the functioning of which requires that “the children become ciphers...in a huge administrative centre” (268). The democratic principle is here utilised to make universal compliance to a bureaucratic system appear as a social and moral good. This ideological drive towards equality, however, is rendered in such a way that it provides an intellectual justification for what appears to be the deeper imperative; economic gain.

Against this democratic principle Burgess contrasts the ideologically conservative notion of “the elite”. The character Ennis demands that “you’ve got to have special training for the specially gifted” as “the world advances through its originals” (268). The emphasis is here placed on the “natural” superiority of the ruling class. From this perspective “democracy is only a means of safeguarding the rights of the individual” and so the programme outlined by Gardner is reduced to nothing but “selling our souls for a few extra quid” (269). The language in which the argument is framed focuses upon “the individual” and their “soul”

being presented as the highest moral and social good in order to ideologically justify the entrenched economic disparities that benefit those considered “the elite”. The “few extra quid”, grubby and materialistic, is contrasted unfavourably with the high, pure air of aristocratic privilege. Yet, the tension within this very argument appears to disprove the inherent superiority of the ruling class; at least in terms of the mystic innate qualities of “soul”. Their cemented economic hegemony appears as something that “democratic equality” would challenge materially; suggesting that the “special training” was perhaps the reason for “the specially gifted” existing, not some innate aristocratic law.

In terms of the practical functioning of schools on a daily basis, however, these ideological debates are absent; the principal economic necessity being the integration of the pupils into the functioning of capitalist society. In one usage of his double-columned graphic device, Johnson portrays the physical proceedings in the classroom on the left-hand column whilst simultaneously showing Albert’s internal thoughts in the right-hand column. As a typographical representation of internal and external experience, this device also demonstrates how disconnected the lesson is as a material situation from the individual perspectives within it. The external-Albert exists materially as an infallible authority figure saying “you’ll have a chance to ask questions later”, to which internal-Albert adds, “to which I shall be pleased to invent answers” (75). “You don’t have to believe in anything to teach it”, Albert thinks, yet teach it he does. A similar situation occurs in another of Johnson’s novels, the autobiography-esque *Trawl*, when Johnson describes a teacher calling him “thief and liar and cheat”, which, despite being factually incorrect, proved to the young Johnson that “she had the power, ah, the power!” (67). Both this teacher and Albert himself demonstrate how the teacher’s central function is not that of imparting truths but of maintaining the dominant hierarchy. You’re “not supposed to be human if you’re a teacher” (79), is the message of *Albert Angelo*.

The implementation of such a power structure upon the students acts in such a way as to force their integration through dissolution of identity and imposition of preferable personality traits. Ward H Goodenough’s article “Education and Identity”, collected in *Anthropology and Education*, describes how education “may be seen as a process in which people are helped to exchange features of their present identities for new ones” (1961, 86). The phrasing of “helped” is perhaps a little misleading here, as is the notion of different “features of present identities”. As Goodenough insists that “those making the change must come to conceive of themselves as actually having new identities” (88) we can see how these “features” in fact constitute traits perceived as socially unacceptable; the notion of “new identities” relating back to liberal notions of the individual as a self-determining and self-sufficient being. The means by which identity-transformation is depicted in both the novels focused on here is through the denial of students having identities in the first place.

In *The Worm and The Ring*, Lodge describes patting a boy’s shoulder as “like patting a bicycle” as “children were so unreal” (47). Indeed, throughout the novel children are depicted as less than human, their characteristics presented bestially rather than as personal character traits. Howarth’s son, in pronouncing words with a certain accent, is performing “the dialect of his particular tribe at the present time” (16). The undertone that “he’s got to speak like that not to be victimised” (16) assumes a barbarity in his son’s fellow students that is simultaneously excused due to their undeveloped “identities”. In fact, the parallels between the students in *The Worm and The Ring* and the figure of the “savage” is extended so far that at one point Howarth’s son’s coat is tied into a bundle of knots – a clear reference to an animistic practice described in *The Golden Bough* in which, through “the principles of homoeopathic or imitative magic, the physical obstacle or impediment of a knot...would create a corresponding obstacle or impediment in the body” (Frazer, 2009: 192). As not-quite-humans, the power structures of the classroom therefore appear necessary in order to

maintain social stability through the propagation of a set of shared norms. It is these norms that constitute the notion of “identity”; the autonomy of the individual being the ideological gloss coating the principle aim of social stability.

It is against this background of a “social” education that we must set both Burgess and Johnson’s novels. To return to Spolton’s article, he describes the character of teacher-as-anti-hero in terms of “some measure of the lack of integration so far achieved” (126) within the post-1944 Act education system. Having seen the economic tensions arising from this Act, and the ideological instability that the new economic model created within educational theory, it is perhaps fair to suggest that the “integration” Spolton refers to is not simply of teachers into the new model of schooling, but of the superstructure itself struggling to “integrate” with the changes in its economic base. As the key engine for disseminating the dominant ideology, the hierarchy of the school must itself be solid. Yet, once the ideological structure is thrown into question by new material developments then the period of instability before the eventual reintegration of ideology is reflected within the social hierarchy of the school. The tensions within these novels are symptoms of an ideological, systemic reconfiguration.

To conclude I will return to Spolton’s article once more and its identification of a significant post-war trend in the large amount of school-novels entering circulation. I would argue that the growing economic prosperity of Britain, combined with the egalitarian 1944 Education Act, led to a point whereby the dominant ideological structure in education proved insufficient and was forced into a period of reorganization around the new material conditions. Holding a central role in the ideological state apparatus, the school represents a space where the resulting anxiety inherent in this process erupts. In setting their novels in schools, both Burgess and Johnson are taking part in the cultural manifestation of these tensions. A rise in education-based literature fulfils a cultural demand created by a sudden ideological vacuum at the time, and similarly provides a window into this historical moment for the modern reader.

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The Performance Archive: Rethinking the Documents of Dance

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Abstract

This paper explores notions of dance knowledge and its place within the process of archiving dance. It negotiates the nature of the knowledge that is inherent in the different sources of dance that remain post performance. The dancing body itself will be situated as an archival site and its potential for contributing knowledge regarding the practice of dance will be explored. Employing theories of embodiment (Fraleigh 1987; 2004, Merleau-Ponty 1969) and archival theory this paper will illuminate new ways of thinking about the archive of performance (Taylor 2003, Whatley 2008) in relation to the following research questions:

- What are the available documents of dance?
- What is embodied knowledge and its function as an archival source?
- How is embodied knowledge transmitted or accessed?

From a philosophical viewpoint, this paper will explore the potential benefits and problems of employing the dancing body as a source of knowledge in dance archival practice. It considers the nature of tacit knowledge embodied within the dance practitioner and the availability/reliability of such knowledge as an archival source. The purpose of this line of questioning is to understand how we can better engage with dance heritage in order to move forward and inform future dance-making processes.

Keywords: Dance; Archives; Document; Knowledge; Embodiment

Performance practices are not traditionally self-documenting as they are fundamentally of the present. Characterising the visual arts as ‘disappearing acts’, performance scholar Peggy Phelan determines that performance practices are defined by their ephemerality, i.e. if they were not transient they would not qualify as performance practices (Phelan 1993: 146). As lived experiences, in the sense of both the practitioner delivering the performance and the audience member, the enduring records of a performance are limited to the material remnants of performance. The archival documents stemming from performance disciplines typically represent the outcome of a performance such as visual recordings, press reviews/photography and other artistic ephemera such as costume design and its realisation. Unlike other visual art forms, performance practices are not typically self-documenting and contemporary dance as an ephemeral art form sits within this category.

In terms of archiving dance as a performance practice, organisations such as the Dance Heritage Coalition (www.danceheritage.org) exist in order to promote proper archival practice in relation to the genre of modern dance forms. The Dance Heritage Coalition insist that the documents selected for archival preservation should

Reflect all aspects of dance; the creative process; the funding and management; the performance or execution; the audience reaction and reviews.

Dance Heritage Coalition, www.danceheritage.org

In suggesting that the documents should 'reflect' all aspects of dance this statement is ambiguous. The transitory nature of dance performance/practice directly impacts upon our ability to trace dance heritage because it happens within the body itself as the vehicle for dance. This paper considers the body a document of dance experience due to the fact that movement occurs through the body and the body does not cease to exist post-performance unlike the ephemerality of actual dance movement.

This paper is above all concerned with the ephemerality of dance and its purpose is to explore how archival materials can be engaged with in order to reflect upon the past and inform current and future dance making processes. As a transient art form, dance is notoriously difficult to capture, and this research considers how we might be more sympathetic to this fact in the dance archive. The absence of the actual dance and therefore the body from the archive is stimulus for reconsidering the value inherent within multiple archival sources available to the dance researcher and practitioner. This paper is particularly concerned with the body as an archival source in order to explore the knowledge that is inherent in the body as a living record of experience. It also considers that the body itself is ephemeral and therefore the reliability of the body as a source of knowledge is explored through the application of philosophical ideas about the body (Fraleigh 1987; Merleau-Ponty 1969).

Because of the temporality of dance as a performance practice, information as regards the actual practice of dance is limited. With the advancement of digital technologies it is becoming more common for practitioners and/or dance companies to engage with technology as a way of expressing the dance experience i.e. blogging/digital storytelling/scratch tapes/video diaries. These innovations offer insight into the dancer's experiences through dialogue with dancers and exclusive footage of rehearsal periods which are traditionally extremely private processes (Whatley 2008: 253). Such practices of documentation are significant in relation to the problem of ephemerality and the archive as discussed in this paper as they are examples of alternative archival practice, designed to capture information that is traditionally overlooked in favour of the more tangible records of performance practice. Increasing numbers of contemporary dance companies and practitioners are becoming conscious of taking their audiences on a journey from the rehearsal process to performance, to educate audiences about the development of dance choreography. This demonstrates the fact that there is information supplementary to that available through the final product of dance choreography (i.e. the performance) as dance choreography unfolds.

This paper will introduce the idea of tacit knowledge as a source of archival knowledge. It will address the issues associated with documenting performance raising questions about the type of knowledge that is available through the archive and explore the potential for the body as an archival source to transmit knowledge of an embodied nature. It will do so through firstly outlining key archival principles and contemporary interpretations of the performance archive from the discipline of performance studies. It will consider the nature of knowledge available through the archive as it is traditionally understood as the material records of events (Millar, 2009:24-25, Forde 2007:32). Secondly, the paper will explore the notion of embodied knowledge through the application of philosophical ideas regarding embodiment and lived experience (Fraleigh, 1987 Merleau-Ponty 1969). The purpose of which is to investigate the knowledge value of the body as an archival source.

1.1 Archives and Performance Practice

Principally, this paper negotiates the capability and value of different archival documents in contributing knowledge of dance practice through time. Archival theory specifies that the function of the archival document is to provide a link between past and present (Forde 2007: 33). Archival materials are considered to constitute evidence and have been characterised as

the ‘documentary evidence of events past’ (Millar 2009: 25). In order to be considered worthy of archival preservation, the archival document must embody an ‘on-going value’ in terms of their ability to remind us of ‘facts and decisions, milestones and achievements’ (Millar 2009: 51). The term ‘archive’ also constitutes the physical location of the documents and materials which philosopher Jacques Derrida determines to be fundamental as ‘there is no archive without a place of consignment’ (1996:11). Traditional archival practice is bound with ideologies in terms of records appraisal (a process undertaken in order to determine the archival value of an item), hierarchy and provenance (Forde, 2007). These terms refer to methods undertaken by the archivist/record keeper in order to determine and being to respect and the original context within which the record came into being to ensure accuracy in terms of interpreting the record/document (Pearce-Moses 2005 available online).

Accommodating for the body as the vehicle for performance, Diana Taylor has communicated a new understanding of the archive of performance specifically through the notion of the *Archive and the Repertoire* (2003). From the perspective of performance studies she presents the archive of performance as a dual entity so as to accommodate the complexity of documenting lived art forms. The *archive* is considered to constitute the actual material (or ‘archivable’) traces of a performance such as ‘texts, documents, buildings and bones’ (2003: 19). Secondly, the *repertoire* refers to the embodied practice or knowledge that shares the temporality of performance (‘non archival, immaterial, disappearing, implicit, spoken, dance’) (ibid). This paradigm recognises that in terms of its ability to transmit knowledge the embodied memory, the performance and movement of the individual are equal to that of the document or material/ extant traces of the performance. Although others have since asked ‘how can the document ever compete with the live performance’ (Gray, 2008:410) through also adopting the notion of ‘implicit’ knowledge forms (Hartley & Rowley, 2008:6-7), Taylor is suggesting that embodied acts ‘generate, record and transmit knowledge’ (2003: 15). With its potential to reveal information that the archive cannot, the repertoire goes beyond the boundaries of the archival items that are considered to be more tangible (i.e. textual records).

1.2 Knowledge and the Archive

With regard to the nature of the knowledge that is available through the archival document, the research discipline of knowledge management offers a useful distinction between knowledge types. Knowledge sources are categorised into either explicit or implicit (tacit). Explicit knowledge constitutes that which is manifest within recorded information that is externally available whereas implicit knowledge is understood to be ‘know-how’ in the human mind or tacit knowledge. Hartley and Rowley recognise that such tacit knowledge can only be made explicit through ‘public expression or performance’ or transferred from one who has it to another through instruction (Hartley & Rowley, 2008: 6). This is an interesting division and the notion that bodily ‘know-how’ can be recorded is presented as being a straightforward concept. In relation to the practice of dance however such bodily ‘know-how’ is acquired through multiple processes and experiences. Dancers require sufficient professional training and each individual will have encountered different methods and varying levels of dance training and performance experience. The dancer typically (but not exclusively) acquires knowledge through the actual execution of movement and as a result learns to dance in a particular manner. In relation to dance, anthropologists have recognised that ‘knowing by doing is different from “knowing” by observing (Peterson-Royce 2002: XV). In relation to the concept of knowledge, Susan Foster explains ‘knowing by doing’ as ‘bodily intelligence’ (cited in Desmond, 1997: 236-256). She implies that through repetitive training and instruction the dancing body is made up of metaphors equating to bodily habits (ibid). In analysing movement others have referred to this intelligence as ‘the private world of

knowing in one's bones' (Moore & Yamamoto: 1988:74). Furthermore, repetitive dance experiences are said to 'build [s] a fund of tacit knowledge' which has especially rich implications when situating the body as a document for obtaining historical knowledge (Blom & Chaplin 1988:16).

Taylor's (2003) empowerment of the body as a source of knowledge suggests that the embodied memories and experiences of the practitioner may expose new knowledge and therefore we might look to the body in order to supplement the knowledge available in the material archival records. The question that arises through Taylor's (2003) work is how the embodied knowledge of the practitioner is obtained, or in knowledge management terms captured/recorded and made permanent (Hartley & Rowley 2008: 6). How does the archive and the repertoire work in tandem with already existing archival materials to trace dance artistic heritage and development?

Dance movement is created both on, and through the body, it exists through multiple genres and the performance of movement is a result of creative and rehearsal processes/ decision making. Dance choreographers recognise that the decision to omit certain movement material is equally as important as those that are selected for the final product (Butcher, 2005: 20). In archival terms therefore, it is clear that choreographic process is of historical value as it is evidence of decision making in dance practice yet this is rarely recorded in a tangible/explicit form.

More recent thinking with regard to archival principles and methodologies goes some way to accounting for the body as a place where knowledge is manifest and transmitted. The archivist and philosopher Hugh A. Taylor recognises that archives should relate to and reinforce the social context within which they find themselves. H. Taylor calls for increased sensitivity towards the body and environment, moving the archive into what he terms a 'post-literate mode' (Cited in Cook & Dodds 2003: 132). This idea reflects the immediacy of the exchange of information between the body and its environment which H. Taylor suggests is 'analogous to oral exchange' (ibid). This is a key insight in relation to the overall investigation as it implies that different modes of communicating knowledge can still be considered in an archival sense.

This approach transcends archival fundamentalism (i.e. appraisal; provenance; hierarchy) in favour of new methodologies which reflect societal changes. In the sense of moving away from written cultures to accommodate for the embodied, H. Taylor's principles resound with the notion of the archive and the repertoire in recognising that there is value in the embodied experiences of the practitioner and prompts us to question what is the nature of knowledge available to us in the archive (2003).

H. Taylor's concepts clearly bring the body into question and the ideas surrounding the knowledge of the body as discussed here reinforce the fact that a significant portion of dance archival knowledge is of an embodied nature (2003). However, these ideas do not communicate what might be 'archivable' in the body. What can we learn through these 'funds of tacit knowledge' (Blom & Chaplin: ibid) to supplement the archive of dance, and how can we access such internalised information?

2.1 The Body as Archive

In identifying that the body contains tacit knowledge which must be transmitted in order to be made permanent and therefore constitute an archival record, Taylor illustrates that in the case of performance, the knowledge of a performance remains with the practitioner after it is embodied through the very act of performance (2003). This is a complex idea that in specific relation to contemporary dance practice Andre Lepecki defines as the ‘after-life of dances’ (2010: 39). Taylor recognises this to be ‘nonarchival’ in conflict with the idea that tacit knowledge can be transmitted and made archival (2003: 15). The tension between these two ideas is important especially if we relate it to the dancing body and wider debate in relation to concepts of embodiment.

The temporality of dance is the overall problem underpinning this paper and broad research problem in terms of capturing dance as an embodied practice. Dance itself is not a tangible, extant document and therefore this paper looks to the dancing body as the place where action takes place as a document. The body itself is also ephemeral as it too moves through space and time and is not fixed to a single point. Phenomenological theory is centred on this debate as it exists to negotiate the lived experience of the body, privileging the internal life of the body as opposed to more historic philosophical theories which presented a hierarchy of body over mind (Descartes (see Sorrell 1999); Foucault 1977). Rather than seeing the body from the perspective of being controlled by the mind (i.e. as a docile body-see Foucault 1977) phenomenology enables us to explore the concept of ‘knowing’ through the body and lived experience. Existential phenomenologist Maurice Merleau-Ponty suggests that embodiment is relational and that the body is what connects us with the world within which we inhabit (1969: 91). From the perspective of ‘being-in-the-world’ Merleau-Ponty connects the body to time and space, reinforcing its temporality through the notion that the ‘present does not cancel its past, nor will the future cancel its present’ (ibid: 81). This idea implies that the body is in a constant state of flux which is a problematic concept when applied to this investigation in terms of tracing the knowledge of the body, reinforcing the fact that the body is not a fixed entity.

The lived body, with its embodied intellect, feelings and experiences, has come to occupy the heart of contemporary performance practice... recognising the body as belonging to a subject, thereby acknowledging its historicity and all its contextual relations as embodied within it.

Mitra, cited in Counsell & Mock 2009: 41

For dance practitioner Royona Mitra, the body belongs to a subject echoing the fact that the body is a vessel of its own history and context. The lived body is recognised as a collective construct, in the sense of its history, experience and social/cultural circumstance. This reinforces the notion of the body as a text and exemplifies its relevancy as an archival document.

The sense of instability communicated through the notion of a lived body poses a problem for its function as a document, in particular an archival document if we are to adhere to the notion of the archive as existing through a place of consignment (Derrida 1996: 11). When placing the body into an archival context (i.e. as a tangible record linking the past with the present) this idea raises the issue of the transfer of tacit knowledge, in order for it to reside in a permanent place. The notion of place raises further questions about the role of the body as a document. The body is recognised as the place where movement takes place, making the body and dance inseparable (Fraleigh, 2004:56). More specifically, the performing body has

been regarded as a container for knowledge or more specifically the ‘signature practices’ of the performer. Performance Scholar Susan Melrose claims that the dancer/choreographer can be considered as an ‘expert practitioner’ with regard to their specific genre of practice as the performing body connotes ‘expert or professional intuition’ through ‘invisible qualities-e.g. ‘soul’, ‘mind’, psyche, purpose, even ‘dance expertise’(2006 available online). The idea of a signature practice is significant as it gives a sense of exclusivity to that performing body echoing the idea of ‘bodily know- how’ and places agency upon the body as having knowledge within. This idea does however emphasise the fact that performing bodies contain tacit knowledge that is unique to their body and the dance repertoire that it performs. Especially interesting is Melrose’s idea of ‘invisible qualities’ which recognises that such information is not explicit (in the archival sense) but still exists regardless of its invisibility.

2.2 Memory and Embodied Knowledge

In line with phenomenological thinking, Fraleigh states that dance as a lived experience leaves implicit traces upon the body (1987) but such traces might take the shape of memory/ muscle memory and choreographic memory. In specific reference to the body and its memory, Jaana Parviainen (1998 :54) recognises the body as a ““place of memories””. Whilst this echoes Melrose’s notion of the body as a container of knowledge, Parviainen also emphasises the internal experience of the body as she suggests that bodily memory is recollected through ‘felt quality’ and as a result concedes that ‘body memories do not lend themselves easily to verbalisation’ (1998: 55). Parviainen concedes that the ‘past is embodied in actions’ which suggests that it is through movement that memory is created and it is also through movement that such memories are triggered. For Henri Bergson, in the temporal (or ephemeral) body the ‘past registers itself as motor habit’ (in Guerlac 2006: 126). Bergson divides the notion of memory into two distinct categories, these being ‘automatic’ and ‘Image’ memory. The former is what is most relevant in this case as it is considered to be the ‘memory of the body’ which is ‘produced through repetition and occurs as repetition’ (ibid) in a habitual sense as opposed to image memory which retains the past in images ‘that carry the mark of the unique moment in which they were lived’ (ibid: 127). Automatic memory is said to perform the past in the present when a habitual action is repeated (ibid) implying that the movement of the body might itself serve as a trigger to memory. Relating this idea to the archive of performance specifically sheds light upon the archive as an active entity in the sense that ‘the archive does not store: it acts’ (Lepecki 2010: 2).

These ideas reinforce the idea of tacit knowledge as an archival source and whilst recognising that memory forms an integral role in terms of capturing experiential knowledge it raises questions with regard to reliability and authenticity. Through the phenomenological approaches to the body as outlined within this paper, the body is seen as a ‘minded body’ (Fraleigh, 1987: 9) rather than a mind in control of a body. As discussed earlier, the dancer’s experience varies from one body to another according to their individual bodily experiences. Additionally as Merleau-Ponty points out, the body is also ephemeral and it’s living through space, time and movement calls into question its reliability as an archival source. The field of knowledge management recognises that information must be made explicit in order to provide a tangible knowledge source. However, the ‘invisible qualities’ (Melrose 2006 available online) of the body, although still recognised to constitute knowledge are not always made explicit and if they are, this must always be done in retrospect. This raises issue with the reliability of memory as the body continues to build its fund of tacit knowledge as it moves through time and space, connected with the changing contexts of the world within which it is placed, and indeed the dance context within which it is placed. Questions can be raised regarding the heritage of the body and indeed bodies. I have referred throughout to a body or the body of dance performance and practice, yet are there greater implications if a collective of bodies are concerned? What does each body remember and how consistent are

each of their experiences. Although each dancer's experience and resulting knowledge could be widely varied there is also potential for collective bodies to reveal a congruent indication of heritage which would be of significant value to the understanding of dance as an embodied practice. Through adding multiple bodies to the equation it might be possible to measure the reliability of the body's memory (in the sense of automatic/ muscle/ embodied etc.) through establishing consensus and therefore gauging how definite the imprints of experience are.

This paper has considered the archive of dance through the lenses of traditional archive theory and notions of embodiment and lived experience. Firstly it has considered archival tradition and common practice and how this relates to the archives of performance practice. Secondly it has recognised the tacit knowledge of the dancing body in particular as an archival source. Through so doing, this paper has raised significant questions with regards to the fact that the archive of performance is not all encompassing as it does not allow for the knowledge generated through the embodied practice of dance. The discussion has negotiated the idea of the body as an archival document and through doing so has exposed the body to be problematic through notions of lived-experience and the complexities of memory. Although it is clear that there is knowledge inherent in the lived body this paper has raised issue with the value of this knowledge especially if it takes the shape of memory. Through considering the memory of the practitioner as the place where knowledge is manifest and the body as a temporal entity, questions are raised regarding the authenticity of this knowledge: how accurate can the body be if this knowledge is to be recalled in retrospect? These ideas also stimulate debate if they are to be placed within the context of the physicality of the body: how accurate can movement and memory be in an ageing body?

Supplementary to this, the discussion has highlighted the fact that the process of acquiring the embodied knowledge of the dance practitioner is not without difficulty. It has raised issue with the ability to access and engage with tacit knowledge types and revealed that further investigation is required into how such knowledge can be transferred and made permanent in order to warrant it worthy of archival preservation. To an extent, the example of how digital technologies are being engaged with to expose pre-performance material demonstrates how the creative process is being made accessible, yet further investigation into the actual archival value of such practise is required. More positively, through the application of ideas relating to the body and its connection with time and space, this paper has revealed that the body is capable of revealing knowledge different to that of the archive as the external record of dance and therefore should be considered capable of contributing new archival dance knowledge.

The question generated from this exploration is what methods we can use to engage with the dancer in order to extract the funds of knowledge from the body and its memory? I intend to pursue this line of questioning through practical methods which engage with the dancer on an individual level. Through interview, log books and video/audio diaries and observation of studio practices I intend to explore the body as an archival document, gaining as much insight into the lived experience of dance as possible through these means.

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Disco_mbobulated (Mis)reading the Dancefloor through the Medium of Cinema

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Abstract

The eye's cornea absorbs light, in order to create an image that the retina can, in turn, communicate to the brain. In a broader sense, cinema absorbs society's contemporary concerns and then projects them back, via the cultural retina of the cinema screen.

The culture and counterculture of a particular time will, therefore, inevitably inform its cinema. This research will argue that the biggest countercultural movement of the last 25 years was the "rave" revolution (now generally termed Electronic Dance Music Culture). The resulting paper will address how that scene can be read through the medium of its cinematic representation.

In this piece, I will address these issues by focusing on one particular film – an as-yet-unreleased North American movie, *Ecstasy*. Using this source material, the paper will incorporate aspects of film theory, exploring the use of diegetic codes within this text, with particular reference to the views EDMC academic Stan Beeler outlined in his book *Dance, Drugs and Escape*. The paper will also incorporate primary research, utilising interviews conducted with the composer of the film's music, and one of its principal actresses.

The paper will explore the peculiar issues that arise when attempting to translate the sensually explosive club experience for an essentially passive, mainstream cinema audience. As such, EDMC may ultimately be ill-served by the films that chronicle its tropes and modes and will ultimately form its cultural archive.

It is anticipated that such research will be of interest to participants in the scene and consumers of such secondary texts, as well as contributing to the on-going academic conversation around EDMC.

Keywords

EDMC, Ecstasy, club culture, rave

1. Perchance To Dream...

We switch off our conscious as we switch off the light and go to sleep, allowing in its place our unconscious to direct its own interpretations of the day's events, in the form of dreams. As a medium, cinema can be viewed as society's attempt to dream, to simultaneously reflect and project contemporary preoccupations, and thereby similarly influence its collective unconscious. In this sense, the cinema itself – a darkened room - is an architectural construct that forms a safe cocoon in which the communal unconscious can evolve. Fully aware of this process of cultural metamorphosis, the film industry deliberately plays on society's concerns *du jour*, transforming them into discursive vehicles to play back to a willing, indeed *paying*,

audience. As such, in its relation to society, cinema can be considered much more potent than mere entertainment.

To take three examples: in 1950s American cinema, the use of alien invasion narratives played on the very real fears within mainstream American society of communist invasion (*Red Planet Mars*, 1952; *It Came From Outer Space*, 1953). Then, as fears became internalised, cinema followed suit, with films such as *Psycho* (dir. Alfred Hitchcock, 1960) playing on anxieties around mental fragility and the apparently easy dissection of an individual and their sanity. In the 1980s fear of new diseases such as AIDS led to a glut of films around issues of “body horror”, for instance David Cronenberg’s *Scanners* (1981) and *The Fly* (1986).

As well as these more generic anxieties, cinema also taps into the cultural and indeed countercultural preoccupations of the day. In purely business terms this is in order for the film industry to produce, distribute and project what it imagines a predominantly youthful audience might find interesting and therefore pay to watch, negotiating what Stan Beeler refers to as “the dialectical relationship between the phenomenon and its artistic representation” (Beeler, 2007: 182).

My broader research will argue that rave culture, or Electronic Dance Music Culture (henceforth EDMC), was the last great countercultural movement of the 20th century, what Matthew Collin calls “the most extraordinary entertainment form yet invented” (Collin, 2009: vii). In line with the academic theory outlined in this introduction, many films have tried to make sense of this phenomenon, ultimately forming a recognised subgenre of “EDMC films”. To roughly outline this topos, films such as *Human Traffic* (1999), *24 Hour Party People* (2002), *It’s All Gone Pete Tong* (2004), and even the comedic vehicle *Kevin & Perry Go Large* (2000), have all centred on club culture as context for their discourse, detailing the scene for a possibly non-participatory audience keen to be entertained and, in some cases, educated. My research will more broadly aim to address what Sean Nye identified in *Dance Cult* as “a current lacuna in club culture scholarship – namely, the scarce critical-aesthetic engagement with filmic representations of EDM culture”.

The approach of this particular paper will be firstly to signpost what is meant by Electronic Dance Music Culture as a subcultural domain, and then consider what might form a club culture narrative. In terms of methodology, the paper will refer to two primary texts - the as yet unreleased films, both titled *Ecstasy* (for the purposes of clarity they will be identified by reference to their director: the one based on the Irvine Welsh story will therefore be referenced as “Heydon”, the other as “Lux”). It should be pointed out that the Heydon film remains unreleased and, although I have read the Irvine Welsh story on which it is based and sourced a substantial quantity of marketing material around the film, I have not seen it. Therefore, it will be considered more for its conditions of production and marketing, rather than the minutiae of its content. I have, however, seen the Lux film, which has had a limited release in North America, via DVD and streaming methods. I need also point out that, although the copy I have is marked as a final cut and will be the one I refer to, it appears the film has subsequently been re-edited.

Taken together, the films will also act as a very pliable springboard into a broader examination of the themes within club culture narratives, and will prove useful in identifying the very particular issues that arise when representing club culture in the film medium. These might include practical issues around, for instance, the use of diegetic and non-diegetic music (a definition of diegetic codes will follow); and representations of recreational drug use. More broadly, issues might concern notions of morality and the very nature of both replicating, and conveying, the energy of a dance club to a passive cinema audience. The research will incorporate primary interviews with an actress from the Lux film, as well as the composer/producer of much of the film’s diegetic and non-diegetic music. Finally, the texts

will be held up against the opinions of film theorist Mark Cousins, and EDMC scholars such as Stan Beeler. The paper will argue that such EDMC narratives can be read through this process of viewing cinema in its relation to wider society and conclude that such close examination will ultimately leave the majority of EDMC films wanting and the club scene itself deprived of an on-going cultural legacy.

2. Everything Begins With An E

Firstly then, in order to define the countercultural domain that concerns this paper, I will start with a very brief outline of what is meant by EDMC. The so-called Second Summer of Love in 1988 was the perfect storm of cultural, political and pharmaceutical effects. A nascent house music sound, defined by a stripped-down, electronic beat, combined with a new drug, MDMA - popularly named ecstasy - and lit a blue touch paper for a generation of young people disenfranchised by the hard-edged politics of Thatcherism. Margaret Thatcher famously said there was no such thing as a society. Whilst possibly true within the quotidian world, in the warehouses, fields and nightclubs of the UK, people found their society on the dancefloor.

As the socio-political impact of the rave scene became clear, then EDMC came onto the radar of writers, journalists and filmmakers - all keen, as outlined in my introduction, to use contemporary club preoccupations as source material for their narratives. In her introduction to the 1997 collection of rave fiction, *Disco Biscuits*, Sarah Champion writes:

It was perhaps inevitable that this culture would finally influence literature too. In the fifties and sixties, jazz and psychedelia inspired writing from Jack Kerouac's *On The Road* to Allen Ginsberg's "Howl" and Tom Wolfe's *Electric Kool Aid Acid Test*. In the nineties, we have Irvine Welsh's *Trainspotting*, the book, the film and the attitude (Champion, 1997: xiv)

Indeed, Champion goes on to argue that EDMC is actually better served by fiction than by its journalism or, indeed, music. Such EDMC films and literature soon formed secondary phenomena, of interest to both participators and outsiders. Stan Beeler writes about this notion this in his book *Dance, Drugs and Escape* and, although I will take issue with aspects of his standpoint, I agree with his assertion that such texts serve two different functions:

the first is to describe the subculture to the mainstream and the second is to allow the members of the subculture to celebrate their participation in ways other than clubbing (2007: 25)

To consider, for a moment, the two texts together. The fact that both films are Canadian-financed productions and either in part (Heydon) or entirely (Lux), filmed in Canada, highlights the very strange co-incidence of their concurrent appearance. This is only accentuated when you note the websites for the two films: www.ecstasymovie.com (Heydon) and www.ecstasyfilm.com (Lux). However on reflection, although the timing of their release may be considered coincidental, their title and choice of subject matter actually says a great deal about the on-going penetration of EDMC within mainstream culture.

It might also be assumed there is an agenda – at turns both provocative and promotional - behind the choice of the word “ecstasy” as the title for a film. MDMA was the fuel that powered the rave revolution. First patented as Methylenedioxymethamphetamine in 1912 in Germany, then further synthesised by chemist Alexander Shulgin in America, in its very early years MDMA was given the street name “Adam” and also “empathy”, because of its affect on serotonin levels and the resulting openness experienced by users (Collin, 2009: 25). However street level marketers realised they needed something more immediate and powerful and settled on, in the words of Matthew Collin, “a seductive new brand name - the

word ecstasy” (2009: 28) which led to a “chemical carnival, a form of mass intoxication without precedence” (Jay, 2010: 46). Such is the ubiquity of EDMC that the potential audience for these two films – the so-called “Chemical Generation” - would be well aware of the connotations of the word beyond its dictionary definition and that as such, the title is codified shorthand *for* that audience, a signifier of its countercultural, chemical content.

However if we now return to the two films, the use of the word is rendered somewhat problematic. In the case of the Lux text, the red pills that form the focus for the film’s drug use are pharmaceuticals stolen from a mental hospital and are therefore patently not MDMA. In the case of the Heydon film, the issue is less to do with pharmaceutical verisimilitude and more broadly to do with the marketing of the film itself. The film is based on an Irvine Welsh short story titled, in fact, *The Undefeated* and subtitled *An Acid House Romance*. The film therefore appropriates the title of the actual collection rather than the novella itself. As argued above, one might assume that this is for the greater marketing impact of the final product.

Both films subscribe to what film critic Mark Cousins, in his work *The Story Of Film*, refers to as “Closed Romantic Realism”. In other words, the fourth wall is very much in place and the drama is contained entirely within the construct of the film, which we observe, I would suggest, as floating voyeurs. Cousins references the word romance as “emotions in such films tend to be heightened” and realism because “people in such movies are recognisably human and the societies depicted have problems similar to our own” (Cousins, 2004: 494). There are, of course, humans within these texts, and love stories at the heart of both films. However, it could be argued that the most intriguing character in both narratives is the drug itself; the most interesting relationship that between the characters *and* the drug. In Teaser Trailer 3¹ a voice over recounts the various street names for MDMA: “eccies, disco biscuits, white doves, the club drug, a love drug, X, MDMA, 100% pure ecstasy”. Teaser Trailer 2² for the Heydon film features pills falling through the air, in slow motion, like chemical confetti. The marketing poster for the Lux film features a mountain of white pills, on top of which stands a girl in her school uniform:

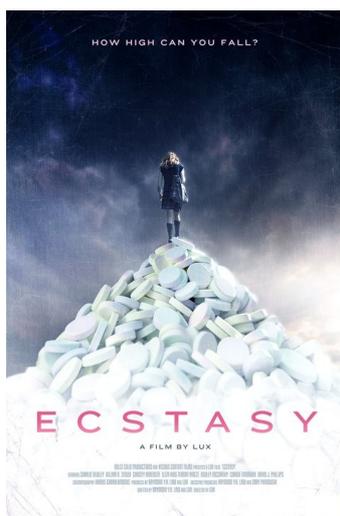


Fig. 1. Marketing poster for the Lux film, *Ecstasy*

¹ Irvine Welsh’s Ecstasy Teaser Trailer 3, You Tube. <http://www.youtube.com/watch?v=Z5ls2Teg160> [Accessed September 27th 2011]

² Irvine Welsh’s Ecstasy Teaser Trailer 2, You Tube. <http://www.youtube.com/watch?v=BkqezYFu43w> [Accessed September 27th 2011]

Both vehicles seem to be suggesting oversupply and overconsumption, that the underlying driver of the films' narrative is excess.

3. From Club Scene to Movie Screen

I will now look at structural issues within the Lux film by a close examination of one scene, before moving onto a broader consideration of the morality of such films in reference to the Heydon vehicle. Firstly, let us consider the use of diegetic codes within the Lux film. Diegetic and non-diegetic music can broadly be defined as follows: diegetic music is that which occurs *within* the environment of the film – for instance a car stereo, a radio or, in this case, the music a DJ is playing in a nightclub. This is set against non-diegetic music, likely to be the soundtrack or incidental music to the piece, designed to be detected by the audience in the cinema but not the actors within the narrative.

In one of the early foundation scenes of the film, the four principal female leads are in the nightclub where one of them works as a DJ. All consume the red pills that one girl, Dianna Meyer, has stolen from her mother Alison, a nurse at the aforementioned mental facility. To convey the impression of the drug taking hold, the director makes sharp cuts in the edit to denote excitement and heightened sensation: eyes are dazed, sweat drips, heads are thrown back in a sexualised display of ecstatic rapture, a lesbian kiss suggests something more exotic than that which has gone before. However, perhaps even more important than the director's schema is how the transformative effect of the drug is conveyed acoustically. In diegetic terms the music seems to bulk up and throb, sounds melt, voice are distorted and there is a ringing in the ears – shared subjectively by the viewers as well as the characters. Therefore the ringing sound might be said to cross the diegetic divide, in that in this case it is heard by both the character and the audience.

This is the key scene for the drama that follows; however it also reflects an essential and peculiar issue in EDM films: how to convey the transformative effects of a powerful drug for a passive film audience. It is not simply a matter of mise-en-scene as geometrics: in the process of rotating a horizontal dancefloor onto a vertical cinema screen, it seems the intensity of the experience dissipates. This particular issue in club culture narratives is accepted by two of the people involved in the film project. In an interview I conducted with Elisa King,³ who plays Dianna Meyer, she explains that the venue used to replicate the club was actually a room beneath a bank, far removed from a nightclub environment. She explains: "It was kind of funny because we didn't have any extras... and we had a club scene to film." Crew, friends and actors were called upon to dress up to play the other clubbers at the party, having to adopt the demeanour of the blissed-out raver in the far more sober, sterile environment of a bank vault. The moment, it seems, is hard to capture cinematically, and then only further loses resolution in the on-going process of its passive consumption. The film's audience is likely to be rested, in a quiet cinema, far removed from the club experience.

In addition, the composer of the film's diegetic music, Nick Hussey, had to retrospectively fit his music to the movements in the scene; for instance, to the tempo of the dancing and the actions of the DJ. Hussey was given time-coded scenes in isolation and without any post-production sound, to then write the music that might have been played in the club. Different takes of the same shot would use different dummy tracks and therefore Hussey had to write to the rhythm of the movement he saw, which results in music ranging from 126-140 beats per minute. In a later interview I conducted with him,⁴ he explains:

³ King, Elisa, actress, interviewed by the author, Mulligans Irish Pub, Manchester July 1st 2011

⁴ Hussey, Nick, film score composer, interviewed by the author, All Bar None,

You have to make it fit – you have to find the certain tempo of the scene and work it out so there's no singing where there's any talking and vice versa. When you're writing a song that's easy – there's two verses, the chorus and outro, all in a set order. But when you're doing a film you can't. You've got to cram it in when you can - get the best bits from the scene, not necessarily the best bits from the song. It's challenging

In a subsequent interview, Hussey remarked that the process was further complicated by these subsequent re-edits of the film. Such edits have re-cut certain scenes and therefore further thrown out the synergy between the mise-en-scene and diegetic soundtrack.

Aside from these very practical issues in conveying the club culture experience to a movie viewer, there are also more broader, moral issues to consider. Beeler argues that in the source story for the Heydon film, *The Undefeated*, “club culture... is bereft of any political motives or overt social project” (2007: 62) and, in a sense, contradicts his own philosophy outlined in the book that EDMC films and literature can be considered via their dialectical relationship with, for instance, race, gender and politics. While it is entirely viable to take such a position, I would argue that EDMC resists such simple categorisation; rather, the dancefloor functions as a kind of Etch-a-sketch in which such rigid definitions can be depicted then shaken off, creating a much more abstract design for life.

4. Imposing Order on Chaos

Perhaps it is therefore for society at large to impose the moral framework onto the club scene; for directors and writers to impose order via a coherent narrative within this secondary phenomena; for academics to make sense of it, in terms of an on-going countercultural chronology. Indeed, Beeler's “dialectical relationship” outlined earlier in this paper is an on-going project, and one that becomes more ordered, the further it is removed from the chaos of the dancefloor. Irvine Welsh had to impose order on the dancefloor in order to turn it into the story *The Undefeated*. Director Rob Heydon then imposed further order – for instance in making the principal male character Lloyd an international drug dealer – to create a more dynamic narrative, in keeping with other tropes of the neo-gangster genre. As such, texts evolve and become more coherent narratives, rather than existing as impressionist renderings of a chaotic countercultural scene.

The Lux text is even more rigorous in imposing a moral framework on the narrative. One storyline involves the priest of the local church, who sources the same red pills via Alison Meyer as her own daughter, in an attempt to drug his congregation. The suggestion of parity between the institutions of church and nightclub (both serviced by the same drug) chimes with an on-going neo-tribal dialectic within EDMC that portrays the club as church and the DJ as priest. For instance, Collin writes of the Warehouse club in Chicago, “for most of the people that went there it was a church for them” (2009: 15) and at one point in the Lux film, the priest says:

Different people, different cultures, pray to all kinds of different Gods. Some people pray to cows. Some people pray to rock stars

Interestingly, a scene from Teaser Trailer 2 of the Heydon film features a character Woodsy, also talking to a priest. “Faith, that's not real,” he says, before holding up a pill to the priest, adding: “this is real”. Although an initial reading of the Lux film might assume it subverts the usual narrative arc of EDMC texts (the drugs originate not within a nightclub but a medical facility and not via a dealer but a character's own mother) the film ultimately abandons this as a narrative position, instead adopting a rather more reactionary standpoint in establishing a

nightclub (Saturday night) in counterpoint to a church (Sunday morning) – the one dark, the other light - rather than as analogous institutions.

5. And The Beat Goes On

It must be assumed that these two films, in their use of drugs, diegetic and non-diegetic music, references to clubs, and especially in their provocative use of title, are placing themselves centrally within EDMC and setting themselves up as EDMC films. Taken together, aside from the co-incident of their title, the release of the two films demonstrates the on-going cultural penetration of EDMC and its relevance as a subject matter for a contemporary cinema audience. In terms of the longevity of this scene, many in the audience for either film, even with an 18 certificate, will not have been born during the flowering of that Second Summer of Love and yet will still be cognoscent of the tropes and modes of EDMC referenced within the discourse. EDMC has arguably enjoyed a deeper – and certainly longer – cultural penetration of any subcultural form since the hippy scene of the late '60s. As Simon Reynolds points out in his book *Generation Ecstasy*, writing in the late 1990s: "this culture – call it rave, or techno or electronic dance music - still feels incredibly vital. It's only just hitting its prime" (Reynolds, 1999: 390).

Perhaps EDMC is subject to the popular myth of the 20-year rule, when cultural movements come back into focus. Indeed, the Heydon film, to be released in 2011, is based on a story published in 1996. If so, in the case of EDMC it will have managed to come back without ever having gone away. Furthermore it might be argued that the North American aspect to the films demonstrates a new reach of EDMC into both Canada and the USA. It is commonly understood that, despite the importance of cities like Detroit, Chicago and New York in the evolution of house music and club culture, it remained a fringe subculture on that side of the Atlantic compared to the UK, where it took a very deep hold. This is backed up by Elisa King, who remarks in the same interview: "In North America it's really catching on – things are changing, especially in electronic music."

What remains a constant is that for North America, as for Europe, the cinema screen is the mirror society holds up to itself. Moving forward, these reflections will collate to form a visual-historic archive, footage by which any particular scene is remembered and judged, fading and degrading not because of the film stock, but because of changing cultural preconceptions. EDMC films sit, collectively, within the film theory outlined in this paper – that such texts can be seen as much more than mere entertainment. However because of the issues of mise-en-scene outlined on a micro level, and the moral strictures on a macro level, a film called - very deliberately - *Ecstasy*, remains largely unsuccessful in translating the spirit of the club scene to the movie screen. While there are some notable exceptions, the end result of such collective failings is that as a consequence, the perception of EDMC will suffer as the decades progress and people consider such secondary phenomena its evolving cultural archive. To return to the dream analogy that began this paper, journalist Stephen Kingston remarked the birth of the club scene itself was a dream, a fantastical dream until it became of primary interest to those who might seek to profit from it:

clubbers had become a little more than consumers to be exploited by corporate concerns, following the well-established youth culture trajectory: revolt into style, rebellion into money. The dream was finally over. (Collin: 2009, 334)

If these films are designed to stand as cinema's dreams of the club scene, then they are unreliable narratives. As such, the integrity of the EDMC mythos may deteriorate, like the vinyl on which the scene was built. Instead it will be for the participators to look inwards; for their unconscious to replay their own memories, their own dreams of the dancefloor.

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Folk Music and Social Dance in Contemporary Britain: an Ethnographic Study.

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Abstract

Sociable folk dancing is a popular pastime for many people in Britain forming a social hub for many of the people who participate. The events and activities organised around this can be viewed as non-youth music scenes that most of the participants adopt at a later time in their life. This paper presents some early reflections on my doctoral research, which takes a cross-disciplinary ethnographic approach through fieldwork, to focus on the practice of Cajun and Zydeco, and Scandinavian folk music and dance in Britain. This paper aims to explore issues such as intergenerational engagement with music, identity production in terms of aging, and how participation in folk social dance fits within the 'life course' of participants.

Keywords

Folk, Life Course, Narrative, Social Dance.

A restless sea that rises and falls, changing shape with the music in waves and peaks and troughs, steady, repeating, evolving in a complexity of rhythms and dynamics. Capricious and playful, changing mood through the night it sighs, then ripples and swirls, a gentle whirlpool that flows and eddies around the room, spinning and turning throughout the small hall, a dulcet wash of colour and light, or whipped up rising and dipping into a lively storm of motion.⁵

The word 'folk' evokes almost a century of intriguing constructs and received popular images; traditional costume, superstition and earthy wisdom, an old man with a hand cupped to an ear, crooning a ballad of rural life, or more recently beer and beards, and summer festivals. Folk music mostly sits apart from pop and jazz lacking the verve and razzmatazz that makes these other types of Popular Music so alluring. Folk social dance conjures up a number of impressions stimulated by mediated images of Maypoles and Morris Men, which conflict with the vibrant picture of joie de vivre, of a contemporary folk social dance, painted above. In spite of fashions for Country Line Dancing, Swing, Jazz, Salsa, Tango, and Zumba, to name but a few, and the recent rise in interest in ball room style social dance stimulated by popular television programmes, there appears to have been no noticeable rise in interest in folk social dance. Again there appears to be an intriguing and noticeable distance between it and other similar, non-folk cultural pursuits, but there is a lot more going on in folk social dance than meets the eye.

This paper is based on findings from a study of how certain types of folk music and social dance are practised in Britain, and aims to contribute to an understanding of how people use

⁵ *Dancer3*, unpublished prose by the author.

music in their daily lives by looking at the music and dance cultures of people interested in two particular types of imported musics. This is a cross disciplinary, ethnographic study and although related work has been done, there have been no in-depth studies in this area and discussion of which has highlighted many questions, preconceptions, and misunderstandings about this music based activity. This research is undertaken from the perspective of one who has been involved with these types of music and dance events for over ten years as both musician and dancer, as well as that of an academic, and this paper presents some reflections based its early stages of fieldwork.

1. The Story So Far – existing literature

Under the radar of commercial and media attention, many people in Britain regularly gather to take part in pastimes that form the social hub of their lives, one such activity is folk social dancing. Exactly how many is ‘many’ is hard to determine, because as with other leisure pastimes and popular hobbies, from wine making to train spotting, and Dungeons and Dragons to Live Action Role Play (LARP); these activities can be highly organised and have huge national appeal, but are generally based on an informal network of loose relationships and casual organisation. The exact number of folk music and social dance festivals and events is likewise hard to determine, in some places there are weekly classes, in others monthly get-togethers and annual festivals and events. However, it may be estimated through participation and anecdotal evidence that thousands of individuals, and possibly hundreds of small groups scattered about the country, come together on a regular basis to take part in a great variety of types of folk social dance.

Interest in what people do with music has increased in recent years as shown by the number of recent studies whose focus has been on music in social life, however, few of these studies have taken folk social dance as their context. These studies have been based on a range of methodological approaches within the social sciences which have addressed a number of important questions (Bull 2000; Cohen 1997; De Nora 2000; Frith 2003). The few studies that have taken folk social dance as their context reflect this range of methodologies. For example, a small number of politically orientated studies have been based on the Argentinean Tango; Savigliano (1995) focuses on the sociological and political meaning of the Tango dance, and Wartluft (2009) takes an ethnographic perspective on issues of gender in Tango clubs and Salons in Buenos Aires. Revill’s paper uses French folk social dance in Britain as the context for assessing the usefulness of ‘nonrepresentational theory’ (after Thrift 2000) rather than social theory in human and cultural Geography (Revill 2004). Wilkinson conducted a comprehensive study in the 1990’s of the social dance events held in Brittany known as Fest Noz and Fest Deiz and on the practices surrounding them. He was concerned with their organisational structure and its relation to professionalism, and with their cultural and socioeconomic significance (Wilkinson 2003). Ruth Finnegan studied and wrote about *amateur* music making in Milton Keynes in the late 1980’s in her study *The Hidden Musicians* (Finnegan 1989), however, other than this little has been written about non-professional music making, an aspect of social life that is important to very many people, including the majority of those who play at folk social dance events.

A very significant characteristic of the activities that are the subject of this research is that the majority of participants are within an age range of 30 and 60 years of age, with approximately equal numbers of participants younger and older than this. The events and activities organised around these forms of folk social dance could therefore be viewed as non-youth music scenes that most of the participants adopt at a later time in their lives. Very little attention has been paid to ‘groups of people and organisations, situations and events involved with the production and consumption of particular music genres and styles’ (Cohen 1999,

p239), where the participants are non-youth. The study of popular music has been overwhelmingly concerned with youth culture and the academic definition of scene itself has generally been based on works to do with youth scenes, rather than participation by non-youth (Cohen 1997; Harris 2000; Peterson and Bennett 2004; Shanks 1994; Thornton 1995; Tsitsos 1999). While some studies have commented on older scene participants (Andes 1998; Calcutt 1998; MacDonald-Walker 1998; Ross 1994; Wienstein 2000), it is only recently that a small number of studies have focused on aspects of non-youth participation in musical activities (Bennett 2006; Hodkinson 2010; Vroomen 2004). The age of the participants in folk music and social dance therefore raises questions regarding the politics of participation in these events; this study aims, therefore, to contribute to a small but developing field of study which considers how age has an impact on types and modes of participation.

2. More than the Dance

2.1 Scene from afar – a picture of the field of study

Folk dancing is often seen as a means by which people connect with an imagined past (cf. Hobsbawm and Ranger 1989; Boyes 1993; et al) and is practised in a variety of forms. The type of folk dancing that is the subject of this study is not the presentational type of dance that one generally associates with folk, for example Morris dancing or Clog dancing in English folk culture, but is social dance where people go along to an event to participate in dancing and not just to be spectators. A few examples would include Breton dance, Irish and Scottish set dance, Contra dance, Salsa, Argentinean Tango, and Klezmer. No one wears costume at these events and, in this country at least, no one goes only to sit and watch, it is not aimed to entertain an audience and for most participants it is an easy sociable activity on par with going to a friendly local pub or a party, but which involves dancing rather than standing holding a drink.

An ethnographic approach has been adopted for this study which, from the very wide range of origins and dance styles within folk social dance, focuses on the events and activities to do with two folk music and social dance styles practised in Britain; Scandinavian Folk Dance, and the dances associated with Cajun and Zydeco music of Louisiana. Both of these styles are practised regularly at national and regional events around Britain and they serve as interesting, contrasting examples, as each is quite distinctive in the style of dance and also in the way in which events and activities are organised around them. Significantly however, they share distinct similarities in their practice and it is these similarities that are of value in the understanding of these music based activities.

Many of the preconceptions and misunderstandings referred to earlier could be accounted for by the low profile of these events and activities, which largely operate non-commercially and attract little or no media attention. For example, events are largely organised on a not for profit, 'break even' basis by enthusiasts, and the larger annual dances and festivals attract between 70 and 120 people. These folk social dance events have no merchandising and very little publicity or advertising and there are no specialist publications. Many of the events which are the focus of this study are also often run on a communal basis, which may involve a level of participation in the event beyond taking part in only the music and dance. Often participants take an active role, through helping with the setting up of the event, volunteer stewarding, tidying and general housekeeping, and at some events by helping in the preparation of communal meals. This often encourages a spirit of equality and cooperation

among participants, with events forming a temporary community, and participants often describe themselves as being part of a tribe or a scene.

This brief description raises many questions about how these participants are using music in this context and the consequent patterns of social organisation that have grown out of this use. It sketches a picture of the field of study addressed in this paper and by addressing such questions, the ethnographer is able to help colour this picture in.

The use of the word ‘scene’ is also significant and is a convenient term to use in this study at this stage. It is a term that participants use comfortably and the concept of ‘scene’ as it is commonly understood in popular music studies (cf. Cohen 1999) could be useful in this context. However, the degree of correspondence that may exist between the uses of the term in these two distinct contexts should not be assumed and although scene has been academically defined, this study is also interested in establishing what meanings participants have when they use this term.

Most of the many dance styles practised at folk social dance events originate from elsewhere and have been adopted in Britain and this raises further questions about who are the participants in these events, why are they using this particular music form, and how are they connecting to it. Why here, why now, what part does it play in their lives?

2.2 Painting the Picture – approaches to the field

This paper is based upon some early findings from an in-depth ethnographic research project which includes the gathering of interview data and observations made while participating in the field of study. The research is also undertaken with two basic reflexive principles in mind and in a spirit of self-conscious, self-awareness, and is therefore informed by two theoretical constructs; in particular Grounded Theory (cf. Glaser and Strauss 1967, Strauss and Corbin 1990) and Reflective Practice (cf. Schon 1983; 1988), and these inform the methodology chosen. This empirical based research is therefore intentionally led by the responses and interests of the people interviewed and observations made through participant observation, and abandons more inductive approaches in favour of the grounded theory approach. However, in addition this research must also be introspective and should examine the position of the researcher as participant in the field of study. Along with many other ethical considerations to do with this type of study, being an insider to the cultural activities being studied, places me as researcher, in a privileged position with a clear view of what is going on. It also, however, brings with it an awareness that this closeness may also at times obscure this insight. The discipline of reflective practise is therefore an essential part of the research methodology and strategy, and is complimentary to the grounded theory approach that has been adopted.

In recognition of the complexity of the interrelationships in this research, a cross-disciplinary approach to the study of these music based activities as a whole has been taken. This has led to enquiries into a wide range of specialisms, such as research from the Medical and Clinical Sciences, to do with health and well being, and gerontology; from Cultural Studies; the Cultural Geography of age, to do with age as a social identity that varies across space as opposed to as a process of biological development; Dance Therapy, Sociology, Psychology and Philosophy. While this research project covers a range of perspectives, this paper will focus on two theoretical approaches which have proved particularly useful in understanding these case studies – Life Course Theory⁶ (cf. Elder and Rockwell 1979; Elder, 1994, 1998;

⁶ Life course theory recognises that while for each individual, historical forces shape the social trajectory of family, education, and work, these then influence behaviour and particular lines of development. While recognising the influence of

Mortimer and Shanahan 2003; et al) and Narrative Theory⁷ (cf. Phelan and Rabinowitz 2005; Leitch 1986: et al).

2.3 Every Picture tells a Story – life course and narrative.

The life course paradigm has developed out of longitudinal social research into human development over the last 50 years and is best viewed as a theoretical orientation that guides research on human lives within context. This is particularly appropriate for the ethnographic methodology that has been adopted as it is people's lives within the context of a particular cultural setting that is being looked at. It treats individual lives very much like a journey and looks at where that individual is now by using retrospective life history techniques, to gain an understanding of the enduring effects of past events. As the ethnographer James Spradley points out, in order to understand a culture the task of an ethnographer is to get inside the heads of the participants in that culture (Spradley 1979; pp7-8). This has many parallels with client-centred counselling in psychotherapy and this is another discipline that has been used in relation to interview techniques and strategies (Egan 2010). Both this type of counselling and these ethnographic interviews focus on letting an individual tell their own personal story and this story is then placed within a larger context. The biographical information given in these ethnographic interviews relates directly to the individuals life course and their story of their involvement in, and experience of folk music and social dance. Taking the lead from studies of literature, one way of viewing these stories is through using the metaphor of a narrative and by using Narrative Theory. By viewing this biographical information as a narrative based on that individual's life course, incorporating a plot and time, it is possible to understand how these individuals view this as a dynamic and meaningful sequence of events, which therefore allows an insight into the significance of participation in folk social dance to these individuals.

2.4 Stories from the Field – preliminary fieldwork reflections.

This approach has been useful in suggesting a way to analyse the interviews undertaken so far, as it offers a way of understanding why participants take part in these practises and what influences their involvement. Vicki for example in her interview talked of working in Derby, and the accessibility of a particular club and a circle of friends as having been very important to her becoming involved in Cajun dance.⁸ This formed part of a life *trajectory* largely informed by geography and work commitments, whereas, June, in her interview, showed that within her own personal *trajectory*, the *transition* from worker to being retired was significant in her present involvement and interest in social dancing. However, for Pete, who unlike Vicki and June had not been involved in any type of dancing before, participation in social dance did not involve a *transition* in his life *trajectory*, but an important *subjective turning point*, after he experienced folk social dance for the first time, at a large social occasion while on holiday with his family in Brittany. Annie, explained her desire to want to 'get the dances right', and her sense of responsibility towards maintaining a tradition that might otherwise die out. This view of folk has been one taken by many people in the past,

human agency (free will in other words, but which of course does not exist in a social vacuum) life course theory also recognises that life choices are contingent on the opportunities and constraints of social structure and culture.

⁷ Narrative Theory can be traced back to Aristotle and studies of poetics, which looked at plot in Greek drama, and began to view narrative as an art form. It is the study of narrative or story, and looks at the ways in which stories are constituted in fictional or non-fictional media content and is also known as Narratology.

⁸ All interviews have been anonymised and names changed in accordance with accepted ethnographic ethical practice.

particularly during the 1950s and 60s, and has had a strong influence on folk revivalists stretching back to Cecil Sharpe at the beginning of the twentieth Century (Sharpe 1972). This statement from Annie, is particularly interesting considering she has no personal link to the 'heritage' she is hoping to preserve. Nearly all of those interviewed, however, mention the fact that 'it was the music' that attracted them at first, that the music 'spoke to them', and that if it was not for the particular type of music that they are dancing to, their interests would be elsewhere.

The social meaning of age can also structure an individual's life course through expectations, informal social sanctions, and social timetables and these values can vary between social and cultural settings. Accepted concepts of social time therefore suggest the right ages for transition into starting school, marriage or retirement, for example, and whether these are early and late transitions. The social meaning of age also creates generalised age categories (such as middle-aged, and 'old'), the boundaries between which can vary between social groups and cultural settings, and are dependent on group definitions and individual perceptions and experiences, which are in turn important in defining individual and group identities. June, mentioned earlier, found herself redefining her own personal identity on retirement, part of which involved taking every opportunity to go to dance events. These interviews give an indication of where these participants place themselves within social time, together with their own perceptions of age as a social construct. Sue, for example, spoke of her feelings about being one of the younger members of this social group, and how she was cautious about introducing friends in her peer group to folk social dancing and her reasons for this, emphasising ways in which age plays a part in how people identify with each other within a group activity. These attitudes and perceptions reveal the role that age can play in both individual and group identity formation, and therefore also, these participants' perceptions of folk social dance as a music based scene.

3. Some Conclusions

The early results of ethnographic interviews with people participating in particular types of folk music and social dance indicate that there is a clear relationship between their involvement and their biographical information. An analysis based on life course theory takes into account that people's lives are socially organized in biological and historical time, and that the resulting social patterns affect the way that these participants think, feel, and act. Ethnographic interviews conducted so far, reveal the social pathways of participants and how these have been shaped by historic and other influences and structured by social institutions. It is therefore possible to examine the *trajectories* that have led to, and shaped these individuals present involvement in folk music and social dance. An analysis using the metaphor of narrative, incorporating a plot and time, makes it possible to understand how participants view these trajectories in terms of a life narrative, whether individual and idiosyncratic, or socially sanctioned and therefore canonical and conformist. It is therefore possible to see how they understand these stories in terms of *emplotment*, of *transitions*, and *turning points*: how life events tie together as a dynamic and meaningful sequence of events, which engage with such issues as participation, and the social meanings of identity and of age.

An analysis such as this allows this research to address such questions as who these participants are, why are they using this particular music form, and how they are connecting to it. It also facilitates an understanding of what influence the age and background of the participants may have on the construction of a folk social dance scene, and how this is understood as a scene.

This research will give some insight into how participants in folk music and social dance perceive their involvement in terms of identity and participation and whether this relates to their socio cultural background as an age group, and will examine their understanding of themselves as an identifiable social group. This research will also contribute to an understanding about the perceptions of tradition by the people who practise these dance styles and of how the participants in these scenes relate what they are doing back to origin and place. Finally, although only in the early stages of this research, there are indications that age is a significant factor in the politics of participation in these folk social dance scenes, and that it is a strong influence on the sense of communalism and on the way that these scenes are organised and run.

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Learner Autonomy between Technical and Social Perspectives

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Abstract

This article examines how the concept of autonomy is construed in disciplines of second language learning and TESOL landscape. There used to be an attitude to interpret practice (and probably promotion) of autonomy from technical and psychological perspectives only where provision of resource material and electronic facilities is assumed to help learners move towards independence. This perspective correlates autonomy with total independence and limits practice of it to having control over learning resources. Through the diverse literature pertaining to learner autonomy, this article argues that autonomy is a distinctive construct available to all learners in their contexts and is expressed in their ability to manage language learning processes with minimal reliance on external authorities. Autonomy in this regard is not synonymous with total isolation or full detachment; rather it is associated with the capacity to make choices and take decisions that could possibly result in improved language competence. An investigation of the degrees of autonomy proposed by Holliday (2003) showed that this construct has been viewed from three different perspectives: Native Speakerism, Cultural Relativist, and Social Autonomy. While native speakerism limits preparedness for autonomy to certain mostly Western cultures, the cultural relativist perspective assumes that autonomy can be found in other settings, but it needs adapted models for promoting it. On the contrary, social autonomy, which Holliday supports, puts practice of autonomy within the grasp of all learners, but it is featured by their context and often takes different forms and degrees based on learners' interest and significance of learning agendas.

Keywords: Autonomy and learner independence; individualisation and self-instruction; learners' conceptions; social autonomy; technical and psychological perspectives

1. Introduction

Research on learner autonomy has developed significantly in the last few decades in general education and in the discipline of Second Language Learning (SLL) in particular due to the increasing awareness that learners should be allowed to compose their own truth and interpretation of external realities, and that we should not impose on them what we believe as ultimate knowledge of that truth (Sinclair, 1996: 151). Promoting this construct among language learners is currently gaining much significance in institutional and informal settings due to the belief that "learning should be seen as a qualitative change in person's way of seeing, experiencing, understanding, and conceptualising something in the real world" (Marton and Ramsden, 1988: 271) rather than a means of increasing the quantity of knowledge in the minds of those who do not know how to benefit from it (Benson and Lor, 1999: 461). Autonomy is supported as an unquestionably desirable goal because it helps learners to emancipate themselves from rigidities and limitations of formal education. Creating opportunities for them to look for alternative forms of knowledge and actions is correlated with improved language competence (Illich, 1979). Encouraging learners to move towards autonomy should not be treated as a slight change in traditions of language

education, yet Allwright (1988: 35) argues that enhancing learner autonomy does not necessarily require "radical restructuring of our whole conceptions of language pedagogy, a restructuring that involves the rejection of the traditional classroom and the introduction of wholly new ways of working", it can be initiated through the efforts of enthusiastic and active teachers who are willing to empower their students to be more autonomous in improving their language skills.

In support of this, Benson (1996: 29) argues that the proposition of Allwright indicates that language teachers can identify and encourage the autonomous classroom behaviour of their students provided they are confident of the benefits learner independence could bring to language learning and language development. Within discourses of Second Language Acquisition (SLA), it could be argued that learners' involvement in formal and informal experiences reinforces their language input and language production, and this is often done by providing them some freedom to work on their own pacing and for their own benefit. In formal SLL, this is done through increasing learners' centredness; whereas their agency, proactivity, and enthusiasm are the impetuses that drive them to explore new learning pathways in informal settings. Autonomy therefore is a means of encouraging learners to share the responsibility of SLL.

2. Overview of Autonomy in Language Education

The concept of autonomy began to gain credibility in SLL in particular owing to the belief that "the development of learner autonomy and the growth of target language proficiency are mutually supporting and fully integrated with each other" (Little, 2007: 14). After the benefits of independent learning have been asserted by learners and educators, the concept of autonomy has become a "*buzz-word*" (Little, 1999: 1) causing a concurrent development in learning theories that began to focus on learners' beliefs, preferences, and needs. However, identity of the concept and researchers' interpretation of it has evolved significantly throughout the last few decades. Understanding of autonomy developed from a misconception that it is synonymous with self-instruction where learners sit isolated in a place with little or no contact with others to a realisation that autonomy is a construct and learning ability that can be expressed inside and outside classrooms and that can be practised individually and within group work. This is because autonomous learners should be viewed as those who "do things not necessarily on their own but for themselves" (Little, 2007: 14).

In the earlier stages of encouraging independent language learning, the concept of autonomy has been perceived as "an ideal state, seldom actually achieved, where learners are fully responsible for decisions about their own learning" (Benson, 1996: 27). Since these abilities are seldom found in all learners in all contexts, the concept has been perceived as laden with Western culture and values (Jones, 1995: 230) and seems to have no roots in non-Western environments. It was also construed earlier by Riley (1988: 28) as ethnocentric (see 3.4.1) which suits certain nationalities but not others, and which involves application of certain cognitive and metacognitive strategies that may not be within the grasp of some ethnic identities (Press, 1996: 244). This attitude interprets autonomy from a Western viewpoint where learners are characterised as autonomous only when they behave and think similarly to Western norms. This interpretation confined practice of autonomy to certain cultures and neglected the natural premise that it is basically "a form of self-mastery, both mastery over one's self – an internal psychological mastery – and freedom from mastery exercised over oneself by others – an external, social, and political freedom" (Pennycook, 1997: 36) which can be aspired to by learners anywhere.

After a period of time, this unsubstantial understanding has improved and autonomy has been perceived as a universal concept that can be promoted among learners regardless of their

ethnic identities. Crabbe (1993: 443) argues that this development in the treatment of autonomy is attributed to unprecedented growth in educational technology and digital resources that provide access to various learning materials quickly and from around the world. It is also contributing to the increase in personal use of technological tools such as the Internet, mobile technological devices, and digital-based resources which facilitate access to diverse information and help learners to overcome limitations of time and location. In addition, many self-instructional multimedia materials are produced to satisfy the needs of individuals who strive to improve upon their English language skills without leaving their jobs or making drastic lifestyle changes (Dixon, 2006: 24). It is moreover due to the significant increase in the numbers of language learners worldwide and difficulty to provide personal instructions to everyone. Independent learning therefore is perceived as a solution for many technical and economic issues.

Based on these factors, a different interpretation and treatment of the concept has been promoted due to a concurrent development in discourses of applied linguistics that began to universalise certain ideas and concepts regardless of their local contexts. Many research findings revealed that the seeds of autonomy can be found even in apparently inhospitable soil (Allwright, 1988: 39) and that the possibility of fostering it in other contexts is highly likely. Autonomy therefore is presented in the Teaching English to Speakers of Other Languages (TESOL) landscape as a culturally neutral concept and a universally compatible notion suitable for learners elsewhere (Schmenk, 2005: 113). In this perspective, researchers do not pay much attention to the cultural variations among learners in each context; they rather dealt with autonomy from the technicalisation and psychologisation viewpoints assuming that provision of appropriate "*learner training*" can empower learners with the necessary skills that allow them to be more independent. Enhancing learners' autonomy hereby is done according to the conceptualisations of scholars, educators, and researchers of what makes "*good language learners*" and how autonomous learners are likely to behave in different SLL situations (Smith, 2003: 130).

This framework assumes that empowering learners with appropriate skills and strategies bolsters autonomy and improves proficiency. The widespread use of study-skills materials and the establishment of Self-Access Centres (SACs) or Independent Learning Centres (ILCs) in SLL institutions reflect these perspectives. This technicalised and psychologised approach is possibly a part of the phenomenon where language learners occasionally need teachers' support and reflection on their progress; however, the potential criticism directed to learner training is that it does not consider the variations of autonomy in every educational context. It neglects the assumption that "the notions of student-centred education, individualism, and autonomy derive from a very particular cultural context [and] these concepts will be structured and valued differently in other cultural contexts" (Pennycook, 1997: 44). Consequently, it does not consider the fact that every learner has his distinctive form of autonomy, which he manifests in different ways and degrees according to his learning needs, and features of the learning context (Cotterall, 1995: 195).

The relationship between the practice of autonomy and social educational context has gained prominence in the TESOL world where it has many variations and interpretations even in the same context. Palfreyman (2003: 190-192) reports on a number of interviews conducted in a Turkish university where learner autonomy is interpreted differently by informants of the same cultural context. Some participants represented it as having the ability to make choices; others interpreted it as organising classroom work, doing homework regularly, and keeping a record of what has been done. Other participants viewed it as seeking assistance from an expert when this is necessary for making the best choices; whereas some material developers

described autonomous students as bright and gifted who can manage their learning independently with minimal help from others.

Palfreyman's argument centres on the improbability of expecting students to think and behave similarly simply because autonomy is a personal characteristic rather than something that can be stereotyped, taught, or acquired from others. This viewpoint is currently less debatable because it overcomes the boundaries of sociocultural elements and technical limitations. Language learners in every context have their interpretation of autonomy which they may (not) display in presence of others due to some invisible walls which prevent others from noticing it. Within this perspective, Holliday (2005: 85) assumes that autonomy goes far beyond the classroom into the fabric of behaviour which exists in all societies.

This less strict interpretation puts autonomy in its wider, broader context where learners' independence is not a gift that can be bestowed by external authorities but a form of critical pedagogy through which they create their own worlds (Freire, 1970: 53). Students' silence, inactivity, and unwillingness to contribute may be explained by others as an absence of autonomy; nevertheless, Holliday does not consider this a sign of passivity but rather due to other factors like application of less engaging teaching techniques or use of materials irrelevant to students' needs and agendas. Accordingly, the way students behave is a part of their autonomy and reflection of social strengths and limitations as well. The practice of autonomy therefore is not confined to certain contexts or only operates when technical and psychological support is provided. Otherwise, "everyone can be autonomous in his own way since autonomy resides in the social worlds of the students, which they bring with them from their lives outside the classroom" (Holliday, 2003: 115). What prevents us from noticing students' autonomy is either because we are adopting a culturist viewpoint, which assumes that certain cultures are not ready for autonomy, or because we are preoccupied with our professional agendas which in both cases prevent us from watching students' autonomous behaviour represented in the discourses of their daily lives and in dealing with the exigencies of education (ibid: 124). Based on this prelude on identity of autonomy, the section below elaborates on the different definitions of autonomy as given by scholars.

3. Definitions of Learner Autonomy

Apart from the political implications of autonomy which is the liberty of a country from whatsoever form of colonialism, imperialism, or occupation, autonomy is etymologically derived from the Greek word *autonomia* which means the condition or quality of self-governance or self-direction within a broader community (Castle, 2006: 1096). In this sense, an individual becomes increasingly autonomous the more he is able to determine the different aspects of his life with minimal or no influence or interference from external powers or authorities. This individual autonomy is inseparable from the whole social autonomy and it ebbs and flows according to the extent to which it is tolerated in a community. From the viewpoint of lexicographers, Hornby (2004: 70) argues that a person is autonomous the more he is "able to do things and make decisions without help from anyone else".

However, I think the argument of Hornby that an autonomous person should not ask for help expresses an idealistic viewpoint that may not exist in reality. It is extremely rare to find someone who is able to go through all aspects of life – including learning – with total independence and consistent enthusiasm for achieving personal goals. There are situations in which people are autonomous but still need guidance for taking correct decisions. In this case, taking independent decisions is conditioned not only by awareness of potential benefits but also by external constraints that influence one's decisions, and it is by no means against autonomy to request help when the shortage of knowledge exists.

From educational perspectives, Holec's (1981) definition of autonomy still presents a generic basis in understanding identity of this construct, and how autonomous learners are expected to behave in disciplines of SLL. Smith (2003: 255) claims that Holec's definition "retains its validity as a common reference point" because it construes autonomy as "*the ability to take charge of one's own learning*" (Holec, 1981: 3). For Holec, this ability is not innate but can be promoted by naturalistic means or by formal learning via systematic, deliberate ways. In this sense, autonomy is not a learnt activity but "a power or capacity to do something; [that is] a potential capacity to act in a given situation ... and not the actual behaviour of an individual in that situation" (ibid: 3).

As argued by Holec (1981: 9-19), the ability to take charge of language learning is closely related to application of different levels of strategies and practical modalities of decision-making. According to his model, an autonomous learner should be able to fix his *objectives* and adapt them to evolving and emerging difficulties. The more short-term goals are achieved, the more long-term goals are likely to be accomplished. He also should be able to define the *contents* and *progressions* of learning by having enough knowledge of learning content, available resources, and stages of improving language skills. In addition, he should be aware of effective methods and *techniques* for engaging in an activity or improving language skills. Moreover, he should *monitor* the procedures of acquisition through self and peer-assessment. In this stage, he can modify the learning content or techniques if they proved less effective. An autonomous learner furthermore should be able to *evaluate* what has been acquired and check whether personal goals are achieved or a new cycle of processing is necessary to progress. However, Holec (1981: 22) implies that not all learners have the same aptitude to go through these stages with full independence because besides the ability to take decisions, an autonomous learner is expected to show immediacy and agency in taking decisions and effectiveness in using strategies.

Similarly, Littlewood (1996: 428) correlates autonomy with "capacity of thinking and acting independently that may occur in any kind of situation including, of course, a situation where the focus is on learning". This psychological stance sets autonomy within any context and any learner given that he is able to take independent decisions and hold responsibility for learning. However, Littlewood does not consider learner independence as the only element that determines level of autonomy; he believes that this capacity is multi-faceted and the degree of autonomy a learner manifests is influenced by many factors. In his anatomy of autonomy, Littlewood claims that this capacity includes both *ability* and *willingness* to engage in independent learning activities. These components are inseparable because some learners may have the ability to take decisions but are not willing to do so and vice versa. Littlewood divides each of these components into two more parts where learners' ability includes "*knowledge* about the alternatives from which choices have to be made and the necessary *skills* for carrying out whatever choices seem more appropriate" (ibid: 428). In addition, he finds that learners' willingness to initiate independent learning "depends on having both the *motivation* and the *confidence* to take responsibility of the choices required" (ibid: 428). By focusing on this psychological stance, Littlewood puts motivation and agency in the core practice of autonomy and the elements that decide its degree. Dickinson (1991: 11) asserts this argument where the implementation of learning decisions is not less important than the ability to take them further.

Based on the framework of Littlewood and the argument of Holec about autonomy, it can be noted that the definitions explicated above construe autonomy as a capacity learners hold and manifest in situations where learning occurs. It can be expressed inside or outside classrooms and learners may (not) reveal it in the presence of their teachers (Holliday, 2003). Hence,

learner autonomy is not synonymous with individualised learning or self-instruction as explained by Holec.

"Individualisation is similar to autonomy in that it largely takes into account the specific nature of each learner. But there the similarity ends: the educational attitude that inspires individualisation, the role assigned to knowledge and the teaching of knowledge on which it is founded, and above all the role which it assigns to the learner make it a process very different, if not altogether different, from the process that leads to the autonomisation of learning (Holec, 1981: 6)".

Similarly, Jones (1998: 378) claims that self-instruction, akin to individualisation, is a long-term learning project initiated, planned, and carried out by the learner alone without the direct control of the teacher, and in some cases, it can be controlled by a teacher who may, without being physically present, take all the key decisions about what will be learnt. For Jones, these modes of learning do not necessarily lead to greater autonomy or better learning because the individual may receive much input but lacks the streams in which he can practise what has been taught.

4. Interpretation of Learner Autonomy

Following on from the propositions of Holec and Littlewood above, I should like to clarify that autonomy should not be construed as synonymous with total detachment or individualisation but as representation of *learner's consciousness and ability to manage language learning with minimal reliance on external authorities. This ability is never absolute; it is rather influenced by knowledge of optimal strategies as well as opportunities of independent learning tolerated in the context.* This construal seems realistic since it puts autonomy in its wider context where it can be found in any context and within any learner, and that can be practised inside and outside institutional learning situations. An autonomous learner therefore benefits from his independence for planning and reflecting on learning goals, procedures, and activities. He also benefits from his socialisation and collaboration with others for consolidating what has been learnt.

This interpretation explains that autonomy is a multi-faceted construct that takes different forms and degrees according to ability to assume responsibility, make choices, and take decisions as well as ability to benefit from experiences and knowledge of others. This explication is supported by many educators like those who developed the so-called "*Bergen definition*" where they construe learner autonomy as "a capacity and willingness to act independently and in cooperation with others, as a social, responsible person" (Dam *et al*, 1990: 102). As argued by Smith (2008: 396), this definition does not confine practice of autonomy to certain ethnic identities since "learners – of whatever background culture – are already able, at least to some degree, to exercise control over their own learning". Guiding this construct requires different forms of pedagogy and different means for dealing with contextual constraints that probably hide us from noticing the autonomy learners already have (ibid: 396). According to this interpretation, enhancement of autonomy should not be limited to technicalisation or psychologisation only, but teachers need to be aware of the different versions of autonomy and the biases within them. For learners, it means all options are open for them to choose the resource material that suits their needs and learning objectives. Hence, asking for incidental support should not be taken as disinterest to contribute or inability to do things independently but a gap in learners' existing knowledge, which they try to compensate from persons that are more educated.

5. Degrees of Autonomy

As explicated in the aforementioned sections, among the many views about autonomy, there is an attitude to classify learners into autonomous or non-autonomous based on their ability of

detachment and skill to work independently. However, Holliday (2003) extensively explains this argument about the degree of autonomy. He describes three existing approaches which represent three different interpretations of autonomy. He labels approach (A) as "*Native Speakerism*" (ibid: 116). This approach divides the TESOL world into "*us*" which refers to native speakers and their culture and "*them*" which refers to non-Western learners who are from other cultures and viewed as unsuited for autonomy. Holliday states that this approach expresses the weak interpretation of autonomy because it is driven by the assumption that autonomy is a culturally-Western concept which may not exist elsewhere, and hence in order to encourage non-Western learners towards autonomy, they need to be trained how to act autonomously. This approach also argues that learners are characterised as autonomous only when they act, think, and learn in the same way as Western learners and when they reflect the image of autonomous learners visualised by native speakers as it exists in their native culture.

Holliday labels approach (B) as "*Cultural Relativist*" (ibid: 116). It indicates that cultures are not necessarily similar and that each culture subconsciously affects the attitudes and perceptions of individuals, including learners, in the context where they live and interact. Hence, it is unnatural to have one form of autonomy or to expect non-Western learners to behave identically like Western ones. Holliday views this approach as less strict because it assumes that the seeds of autonomy can be found anywhere; however, it needs different ways in order to survive and even probably thrive (Allwright, 1988: 40). This includes devising special methodologies and techniques that suit learners, something which Pennycook (1997: 35) puts under "*cultural alternatives*".

Holliday labels approach (C) as "*Social Autonomy*" (ibid: 116) where he puts autonomy in its broad social context which is particular to every individual in a particular society and in a particular learning context. Holliday (2005: 88-89) argues that this approach helps to escape the trap of culturism because it brackets three disciplines namely:

- "not beginning with an essentialist cultural description of students from a certain part of the world, and not presuming that autonomy is the domain of a Western (or any other) culture";
- "trying to see through and beyond a TESOL professionalism which is influenced by native-speakerism, to search for the worlds which students bring with them"; and
- "presuming that autonomy is a *universal* until there is evidence otherwise, and that if it is not immediately evident in student behaviour, that it may be because there is something preventing us from seeing it, thus treating people equally as people".

Holliday hereby assumes that autonomy exists inside every individual learner who may or may not display it in situations where they are expected to behave independently. He renders this apparent lack of autonomy to the "*Invisible Walls*" (ibid: 90) that reside in the social context and educational regime and inhibit students from exhibiting the autonomy they already have. In many situations, apparently passive learners can show sensible degrees of autonomy when they learn outside classroom or when they deal with teachers in less formal situations. Through approach (C), Holliday sets a wider interpretation of autonomy which includes all learning practices done by individual learners and viewed by them as effective and appropriate. It also signifies that autonomy is within the grasp of each learner who displays it in choice of the strategies he applies for meeting goals. This capacity may not be expressed in the presence of others and may not take the form anticipated by others as well.

6. Conclusion

At the beginning of the article, I presented in this theoretical outline how enhancing learner autonomy is linked with better learning and improved linguistic competence in particular. An elaboration of the historical development in the interpretation of autonomy was given to signify how understanding the identity of the concept has evolved throughout the last decades. My presentation of the different definitions of autonomy helped to see the many perspectives from which this learning construct is treated. This article argues that learner autonomy should not be taken as ability maintained by certain identities over the others but a distinctive construct available for all learners in all contexts. Promoting this construct should not be considered from the perspective of technicalisation only but should be based on the characteristics of each context and the learners' needs and objectives. This approach is in agreement with the postmethod pedagogy and context approach for second language learning proposed by Kumaravadivelu (2001).

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Growing Apart: Oil Resource Politics and Violent Conflicts in Nigeria

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Abstract

From a position of relative obscurity, oil has since the 1970s become a central factor in Nigeria's political economy. However, even though oil is a source of wealth, power and a basis for national unity, it has paradoxically been one of the basis for disunity and agitation for ethnic self-determination. This is especially where the principles for controlling and sharing of the oil wealth are bitterly contested by those who feel that they have been sidelined or cheated. The objective of this paper is to argue that although Nigeria being an oil producing country possesses the potential for rapid development, politics and struggle for its huge oil endowments dampen, rather than brighten the prospects for unity, stability and development, and also paradoxically motivates people to engage in violent conflict against the Nigerian State.

Key words: Ethnic self-determination, national unity, Nigeria, oil resource, violent conflict

1. Introduction

Whereas the ethno-political datelines of Nigeria identify perennial conflicts between the major ethnic groups whose elites dominate national politics, in contemporary times, the dynamics of ethno-political conflict has shifted to oil control right between the minority groups of the oil producing States and the Federal Government of Nigeria. To be more specific, as a result of the high stakes in oil ownership and control, it has featured prominently in the politics within and between the various groups in the oil producing areas of the Niger Delta, and the Federal Government of Nigeria.

Given the unabated struggle for oil ownership and control, since the second half of the 1990s to date, Nigeria has been witnessing renewed uprising by ethnic communities of the Niger Delta against the Federal Government and oil-producing companies (Ejobowah, 2000). The concern here is that, unlike the Ken Saro Wiwa-led uprising that was limited to the Ogonis who inhabit a small part of the Niger Delta area, the on-going crises involve several communities spread across it. As in the case of the Ogonis, the current uprising has been violent and deadly, and its geographic spread portends danger to the unity, security and development of Nigeria (Osaghae, 1995).

This paper intends to argue that the discovery of oil, the mode of extraction and operational values of MNOCs, and politics of oil revenue, lead to poverty in the oil producing areas, and poverty in turn motivates the Niger Delta communities to engage in violent conflict against the Nigerian State.

2. Oil Ownership Ideologies: A Source of Oil Resource Violence?

Since oil was discovered in the Niger Delta in 1956, both the Federal Government and the Multi-National Oil Companies (MNOC) on one side, and the ethnic minorities of the Niger Delta have contrasting claims of oil ownership, and indeed the means to secure or consolidate

the control of oil. In the view of Iyayi (2008:1), 'the ideologies of the Federal Government of Nigeria and the MNOC about oil accounts for crisis of monumental proportions in the Niger Delta'. These ideologies include among others the following:

Oil is a national resource that belongs to Nigeria rather than the Nigerian people in general or oil - producing communities in particular. Hence, agitations for resource control or change in the derivation formula are either politically motivated, lack merit or orchestrated by trouble makers and criminals. In a similar vein, force or a military solution rather than political or economic solution is what is needed to deal with the demands and agitations by the Niger Delta communities. Furthermore, the Nigerian indigenous ruling class, the government of Nigeria, and the Nigerian people cannot develop Nigeria; only the ruling classes, states, peoples and agencies of the advanced imperialist countries can. As a consequence, the Nigerian indigenous ruling class, the Government of Nigeria, and the Nigerian people must always be in partnership with the agencies of the advanced imperialist countries in their efforts to develop Nigeria. Therefore, nothing must be done by the Nigerian indigenous ruling class, the government of Nigeria, and the Nigerian people to oppose, contradict, criticise or fight against the development strategies, efforts, ideas and processes advanced by the ruling classes, states, peoples and agencies of the advanced imperialist countries to develop Nigeria. Finally, the Nigerian indigenous ruling class and the government of Nigeria have a responsibility to provide 'an enabling environment' by whatever means- including the use of force, repression and abrogation of the rights of the Nigerian people for the implementation of the development strategies advanced by the ruling classes, states, peoples and agencies of the advanced imperialist countries.

On the basis of these ideologies, the Federal Government of Nigeria defines the attempts of the oil producing communities in the Niger Delta to ensure more just and equitable relations in the extraction and appropriation of oil and revenues as threats to 'unity, security, economic and political stability' that undermine not only the efforts of the ruling classes, states, peoples, agencies and Multinational Oil Companies to develop Nigeria but also the accumulation practices of members of the indigenous class.

In the case of the MNOCs, in order to achieve minimal operational costs, the methods of oil extraction in Nigeria is carried out in the form of gas flaring, oil spillage, indiscriminate construction of canals and waste dumping; embarking upon major oil and gas exploitation activities without conducting Environmental Impact Assessments; the application of continuous pressure on Nigeria through their home governments for the adoption and maintenance of weak policy regimes on oil and gas exploitation; and development and submission of proposals for national legislation. In addition to the above operational methods, oil extraction by MNOCs according to Jones (1998) is framed within an entrenched oil industry value or ideology of relating with native peoples as follows:

First, profit maximisation is the only basis upon which a company can run, so that any expenditure beyond what is required to get out the oil is resisted. To this end, the global companies should be free to act solely on the basis of profitability without regard to national, local and environmental consequences. In addition, a deal can be made with governments only- not with individuals and subnational communities regardless of the government's legality or morality. Similarly, once an agreement has been made with a government, oil mining company can do what it likes, infact, to act as if it is a government agency. Finally, there should be no corporate responsibility to the place or community of operation; rather, it is the market- the industrialised world has a right to have the resources it wants, at the lowest price, and regardless of the costs to local people who are obliged to play host to the oil mining companies.

With the held ideology of the Federal Government and the operational values of the MNOCs, the people of the oil producing areas are expected to keep quiet and be law abiding as any activism and resistance on the part of the oil producing communities is interpreted as subversive, inimical to progress and therefore deserved to be crushed. However, in contrast to the ideologies of the Federal Government and the MNOCs discussed above, the Niger Delta communities are angered by the injustice in the relations formed around oil extraction and environment tragedies, the paradox between the source of oil revenues and the passive poverty of their communities, the military occupation and militarisation of the Niger Delta, murder of nationality leaders, weak regime of rules and regulations that govern oil extraction and subversion of the principles of federalism among others. Given the above, to the Niger Delta communities, in order to obtain fair share of the national cake, the only language that both the Federal Government and the MNOCs understands, is activism, militia activities, kidnapping, bunkering, and sabotage among others.

3. The Costs of Nigeria's Niger Delta Oil Resource Conflict

There is no doubt that, as a result of the on-going conflict, the oil producing states and the Niger Delta areas in particular has been transformed into one of the several hot spots of the world. In view of the security and humanitarian crisis involved, there is therefore an urgent need for the stakeholders in the oil crisis to address the problem for a number of reasons.

First, there is need for peace, security and development in a region that has long been a theatre of war and at the same time, the economic heartland of Nigeria. For instance, the Ogoni rebellion according to the United Nations High Commission for Refugees (UNHCR) resulted in deaths and destruction of the community, producing refugees estimated by the to be 5,400. Similarly, the on-going confrontation in the Niger Delta has had its toll directly on human lives. In one instance of military operation on 30 and 31 December, 1998, it was reported that 26 civilians were killed and 200 wounded, with most of the latter subsequently losing their limbs to amputation. On the other hand, 80 soldiers were reported missing. In another instance of confrontation at the Forcados oil export terminal in February 1999, it was reported that 35 youths were killed by the Special Task Force soldiers (The Now, 25 February – 3 March, 1999; Guardian, 4 January, 1999; Vanguard, 2 January, 1999; Vanguard, 5 January, 1999 and Vanguard, 27 April, 1999). Despite the return to civil rule, the confrontations and killings are still on-going. In all of these events, foreign oil workers are not spared as they are kidnapped and used as bargaining chips by the Niger Delta youths and militias.

In addition to the above, the effects of the conflict on the Nigerian national economy have been enormous. The oil industry has lost many workings days. For example, in the first eight months of 1998, Shell, the largest oil company in the region, lost about 11 billion barrels of crude oil estimated at \$1.32 billion (Guardian, 7 January, 1999). Such was the scale of operational shut downs in 1998 that the Shell Company had to declare force majeure on exports at its Forcados and Bonny Terminals. This meant that Shell could not meet its obligation to supply oil to overseas customers (Newswatch, 9 November, 1998; Newswatch, 16 November, 1998).

Similarly, although the exact amount of oil stolen in Nigeria is unknown, according to Obasi (2009), it is estimated to range between 30,000 and 300,000 barrels per day. The stolen crude oil we refer here means, oil taken from pipelines or flow stations, as well as extra crude added to legitimate cargos that are not accounted for. A recent study by the International Centre for Reconciliation (ICR) in 2009 put the total value lost to the Nigerian economy from stolen crude and disrupted oil production between 2003 and 2008 at N14 trillion (approximately US \$100 billion). The above figure at best may be a rough estimate, because

the Nigerian government does not keep statistics that distinguish between stolen crude and shut-in production, nor between losses through bunkering and losses through forged bills of lading. The table below is the summary of the losses Nigeria incurred as a result of oil being stolen or shut in-oil production.

Table 1: Estimated value of Nigeria's stolen and shut-in oil production, January 2000–September 2008

Year	Average price of Bonny Light per barrel (in USD)	Volume of oil stolen per day (in barrels)	Value of oil stolen per annum (in USD)	Volume of oil shut-in per day (in barrels)	Value of oil shut-in per annum (in USD)	Total value of oil stolen or shut-in per annum (in USD)
2000	28.49	140,000	1.5 billion	250,000	2.6 billion	4.1 billion
2001	24.50	724,171	6.5 billion	200,000	1.8 billion	8.3 billion
2002	25.15	699,763	6.5 billion	370,000	3.4 billion	9.9 billion
2003	28.76	300,000	3.2 billion	350,000	3.2 billion	6.9 billion
2004	38.27	300,000	4.2 billion	230,000	3.2 billion	6.4 billion
2005	55.67	250,000	5.1 billion	180,000	3.7 billion	8.8 billion
2006	66.84	100,000	2.4 billion	600,000	14.6 billion	17.0 billion
2007	75.14	100,000	2.7 billion	600,000	16.5 billion	19.2 billion
2008	115.81	150,000	6.3 billion	650,000	27.5 billion	33.8 billion

Sources: Coventry Cathedral, 'The Potential for Peace and Reconciliation in the Niger Delta'. ICR, Coventry, UK: February 8, 2009, p. 159; Peace and Security Secretariat, *Niger Delta Peace and Security Strategy Background Papers*. Port Harcourt unpublished paper, 2006, p. 25.

Due to the large scale shut-in oil production, the Guardian, 2 January, 1999 quoted General Abdulsalami Abubakar, the then military ruler, where he acknowledged that the:

[G]lobal decline in the international crude oil prices ... and the temporary closure of wells in the Niger Delta led to a sharp reduction in government foreign exchange earnings. Consequently, the budgeted 1998 revenue of N216.336 billion from oil could not be realised.

The inference one can deduce from the foregoing is that, there is no doubt, oil being the engine that drives Nigeria is not only a source of ethno-political tension, but it is also a special issue that touches on unity, security, stability and development of Nigeria.

4. Government/MNOCs Responses to the Oil Conflict in the Niger Delta

Given the frequency, security and humanitarian nature of oil crisis in the Niger Delta, there is no doubt, the Federal Government, the Multinational Oil Companies, the oil producing communities in the Niger Delta and the international communities have all been affected by the oil conflict in one way or the other. In order to address the major negative implications of

the oil conflict for the benefit of all the stakeholders, a number of initiatives have been adopted by the Federal Government of Nigeria and the MNOCs to assuage the anger and demands of the oil producing communities in the Niger Delta. Among the initiatives, the following have been popular:

1. The Projects Approach (undertaking such projects as building hospitals, schools, etc)
2. The Agency Approach (establishing development agencies such as the National Directorate of Employment (NDE), Oil and Mineral Producing Areas Development Commission (OMPADEC) and Niger Delta Development Commission (NDDC)
3. The Political Empowerment approach (creation of Local Government Areas, States and geopolitical zones; appointment of prominent individuals from the Niger Delta to positions of national leadership)
4. Providing Development Frameworks (establishing Plans for development such as Master Plans, National/State and Local Government Economic Empowerment Development Strategies – NEEDS, SEEDS, LEEDS, or initiating national policies as in the National Policy on Poverty Eradication which are then passed on to other state institutions and agencies to implement)
5. The Financial Empowerment Approach (giving cash or bloc grants to states and communities, providing micro credits to community members through third parties, etc)
6. The Rule Making Approach (as in the Revenue Derivation Formula, making laws and regulations for the ‘development’ of the Niger Delta or as part of national legislation on property rights, environmental, etc.)
7. The talk-shop Approach (convening National Summits on the Niger Delta; inviting leaders recognised by the state and the oil companies for discussions/consultations, etc)

It is imperative to note at this juncture that, as a result of the limitations of the above approaches, the government of the late President Umaru Musa Yar’Adua introduced the ‘Niger Delta Amnesty’ in 2009. Despite the Amnesty, the Niger Delta communities and Nigeria in general are yet to experience peace and security. For instance, apart from series of mass protests in Abuja- Nigeria’s capital, the Niger Delta activists claimed responsibility for the October 1st 2010 massive explosions in Abuja. Similarly, in December, 2011, the Niger Delta Youths blockaded the Murtala Mohammed Bridge at Jamata, Kogi State.

5. Preliminary Findings (Analysing the Essence of the Oil Conflict)

The struggle for resource control by the Niger Delta communities is rooted in the perceived distributive inequities in the distribution of oil revenues since the end of the Nigerian civil war. At the heart of the discontent of the ethnic minorities was monopolisation and abandonment of the derivation principle of allocation, which provided that revenues derived from natural resources should be allocated in proportion to the amount contributed to the central purse by the various Units- Regions/States of the federation. In the 1950s and 1960s the application of this principle ensured that the three Regions- dependent largely on cash crop economies, were allocated 50 per cent of their contributions to the central purse. This placed them largely in control of the revenues derived from agricultural and mineral resources within their regions (Uche & Uche, 2004)

However, from 1970, federal control of oil led to the progressive reduction of derivation as a revenue allocation principle and its replacement by the Distributive Pool Account (DPA) or Federation Account that emphasised population size and equality of states as principles of

revenue allocation. This system shifted the control of resources from the regions- now called states to the Federal Government, by implication retaining the control of most resources by a Federal Government controlled by the three majority ethnic groups, which had also controlled the regions (Ejobowah, 2000). The ethnic minorities of the Niger Delta saw the monopolisation and abandonment of derivation for allocative principles that favoured the majority ethnic groups and Federal Government as an act of injustice and further evidence of their exploitation and marginalisation in a highly centralised Nigerian federation.

As can be seen in table 2 below, the discovery of huge quantities of crude oil and gas in the Niger Delta areas changed dramatically, the revenue sharing formula established in the early sixties.

Table 2: Federal – State Percentage Share in Petroleum Proceeds (1960- 2002)

Year	Share of Producing State (%)	Share of Federal Government %	Distribution Pool %
1967	50	20	30
1967-1969	50	50	-
1971	45	55	-
1975	45% minus off-shore proceeds	55 plus off-shore proceeds	-
1979	20% minus off-shore proceeds	80 plus off-shore proceeds	-
1981	-	100	-
1992	1.5% minus off-shore proceeds	98.5 plus off-shore proceeds	-
1999	3% minus off-shore proceeds	97 plus off-shore proceeds	-
1999	13% minus off-shore proceeds	87 plus off-shore proceeds	-

Source: Sagay: *The Extraction Industry in the Niger Delta and the Environment*, 2001, p. 7.

The data in the table 2 above is evident that, in the 1960s, the oil producing states received 50% of the revenues derived from their local areas. By 1981, the oil producing states received no share whatsoever; in 1999, they were summarily allocated 13%. Efforts to negotiate this formula by the people of the Niger Delta at the 1994/95 State sponsored Constitutional Reform Conference were summarily rejected by the Federal Government. The underlying dynamic to the changes in revenue allocation from the 1970s onwards resides in the play of politics between the majority and the minority nationality groups in Nigeria. For instance, according to Sagay (2001:7),

... [E]ven a superficial political analysis of the situation will reveal that the fate of the mineral resources of the Niger- Delta minorities, particularly the trend from derivation to Federal Government absolutism, is itself a function of majority control of the Federal Government apparatus. In 1960, there were no petroleum resources of any significance. The main income earning exports were cocoa (Yoruba, West) groundnuts, cotton, and hides and skin (Hausa/Fulani, North) and palm oil (Ibo, East).

Therefore, it was convenient for these majority groups usually in control of the Federal Government to emphasise derivation, hence its strong showing in the 1960/63 Nigerian Constitutions.

On the basis of available evidence, it becomes easy to observe that the violent oil conflict in the Niger Delta arises from the politics formed around oil extraction activities and the unfair appropriation of the huge oil revenues from the area.

Perhaps, it is understandable why the Federal Government has been able to successfully monopolise oil revenue. For instance, about forty years of Nigerian political governance was under military dictatorship. Thus, the country's federal outlook has been transformed into a *de facto* unitary system. During Nigeria's successive military rule, political governance was synonymous with military operations- hierarchical structure, one way flow of order, obedience and abhorrence to initiative and autonomy pervaded governance in Nigeria. Thus, State Governments lost all semblance of autonomy as their Military Governors were appointed by, and receive orders from superior officers at the Centre in Abuja. Under this circumstance, the question of the States challenging the Centre over rights to revenue generated in their domain generally, and ownership and control of oil could not arise. The situation remained the same even under the civilian administration- 1999- 2011. This is because, the Military designed the modus operandi of the republic, and more importantly, due to the dominant influence of the ruling party- Peoples' Democratic Party (PDP), which not only imposes gubernatorial candidates on the State, but made all State Governments accountable to it, the country therefore, appears to be practicing a one party state. More importantly, the States are weak, and therefore cannot challenge the Centre willy-nilly since they depend on the Centre for fund to survive. Given the gaps in the powers of the States- under the military regimes and civilian administrations, the Central Government has been able to successfully monopolised oil revenue. Similarly, since the States are unable to challenge the Central Government, cultural groups and civil society activists among others have taken advantage of the gaps to confront the Government on behalf of the organisations they represent.

6. Summary and Conclusion

This paper analysed the centrality of oil politics to the violent conflicts in the Niger Delta region of Nigeria. On the basis of the discourse, oil has been at the heart of distributive politics that have been perceived as discriminating against the region from which the oil wealth originates. As such, oil has become the whetstone of demands for local autonomy and self-determination by those marginalised by the hegemonic distributive logic, and the basis for which the Federal Government of Nigeria, backed by foreign oil interests seek to contain and neutralise any threats to their monopoly control of oil.

The paper by implication noted that, the disruptive conflicts in and beyond the oil-producing states will scarcely abate without some fundamental reforms in the oil policies and ideologies of the Federal Government and the MNOC, and in their stead have the popular aspirations of the vast majority of the citizenry, including ethnic minorities, significantly incorporated into the trajectory of governance. For this to occur, the government of Nigeria must change its perception of the problem. A framework that encompasses political, economic and social should be adopted and implemented with the needed level of political will and commitment on all the parties involved in the crisis.

In conclusion, for Nigeria and other African petro-states, to avoid growing apart, two lessons are imperative: They should get the oil politics right, and use the oil wealth for broad-based

social, economic and political development, and embark on that transition from the oil curse to the oil blessing for the over all benefit of national unity, stability and development.

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An Investigation into the Creation, Implementation and Communication of Ethical Codes of Conduct in U.K SMEs

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Abstract

Purpose: Overall, this paper explores the validity of current practices in the use of codes of conduct in small and medium sized enterprises (SMEs) as well as multi-national corporations (MNCs). In more detail, it focuses on the overall processes involved in creating, compiling, conducting, communicating, interpreting and evaluating codes and their resultant effectiveness on ethical behaviour in organisations. Current organisational codes of conduct underpin the basis of the investigation with the view to developing new knowledge and understanding in this area.

Research Approach: The data for this study was obtained from 30 SMEs in the North West of England. The investigation included the design and administration of a quantitative questionnaire of 30 questions that considered the application of codes of conduct within organisations.

Findings: Findings from the questionnaires indicated there is a substantial use of codes of conduct in SMEs but there needs to be further integration and communication of the codes. Training of business ethics and the code of conduct is another area which needs to be developed in SMEs. The combination of the blended research approach provides an enlightened work template for the effective use of codes of conduct as a tool to measure organisational performance. It is envisaged that this investigation will lead to a larger study where 5 organisations will be considered in further depth from different sectors.

Keywords

Business Ethics, Codes of Conduct, Corporate Social Responsibility, Small and Medium Enterprises (SMEs).

1. Introduction

There are many definitions constituting an ethical code of conduct. Pater and Van Gils state it is, “A written, distinct and formal document which consists of moral standards used to guide employee or corporate behaviour” (2003:764). However, literature suggests there is not one explicit definition or consensus about the purpose, content, process of development and implementation, or use and impact of ethical codes of conduct (Frankel, 1989; Kaptein, 2004; Stevens, 2008; Messikomer and Cirka, 2010). This topic has come into prominence in the last ten years. Crane and Matten have indicated there has been a substantial increase in the use of ethical codes of conduct during the 1990s and 2000s. They believe, “Around two-thirds of large UK firms now have some kind of formal ethical code. However, evidence of

their prevalence in SMEs is fairly scant” (Crane and Matten, 2010:192). The significance of the topic is further emphasised by the fact that 99.9% of companies in the EU are SMEs (von Weltzien Hoivik and Shankar, 2010) This research will therefore attempt to investigate the prevalence and communication of ethical codes of conduct in small and medium sized enterprises (SMEs) in the North West of England.

It is crucial to define Corporate Social Responsibility (CSR) as codes of conduct greatly refer to this activity. The European Commission defines CSR as:

“A concept where companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis” (Commission of the European Communities, 2006).

There are a variety of codes of conduct that can be adopted by organisations, with some having one major code whilst others have multiple smaller codes, relevant to specific functions, departments or processes. Van Tulder and Kolk (2001) propose that organisations are now faced with a ‘Cascade of Codes’. The percentage of companies believed to be adopting these may be exaggerated as most studies have involved large multi-national corporations as subjects. It can be argued that the introduction of ethical codes of conduct have been caused by public pressure and companies response to this pressure (Ursey, 2007). Valentine and Barnett (2002), researching mainly medium sized organisations, have reported that the uptake of codes of conduct is at 37%. However there is limited statistics of codes of conduct in SMEs.

1.1 Aims of the Research

- To investigate the use and of prevalence of codes of conduct in small and medium sized enterprises (SMEs).
- To identify the approaches espoused by SMEs to the implementation and dissemination of codes of conduct and how this can be related to the overall size of the organisations as well as the type of business.
- To examine the development of code of conduct training role in SMEs.

2. Literature Review

2.1 Definitions of Ethical Codes of Conduct

There are many different definitions of ethical codes of conduct with no commonly accepted classification apart from the fact they are usually a formal and written document (Cleek and Leonard, 1998; Schwartz, 2001). Kaptein and Wempe (2002) further promote that the business code defines the responsibilities of the organisation towards its stakeholders and demonstrates the conduct the corporation expects of employees. It is usually led by values and consists of morally orientated policies and acts as an invisible hand guiding employees on how they should behave.

Confusion has arisen when defining what purports to be a code of conduct; this is due to the interchanging of terminology that is used to define these documents. Terms used are ‘codes of ethics’ (Cressey and Moore, 1983; Messikomer and Cirka, 2010; Long and Driscoll, 2007), ‘codes of conduct’ (Kolk and Van Tulder, 2001; Garrod and Fennell, 2004), ‘codes of

practice' (Schleilmilch and Houston, 1989) and 'corporate ethics statements' (Murphy 1995). However Fischer and Lovell (2009) have identified that although the document itself is similar whatever it is called there is a distinct difference between codes of conduct and codes of ethics. Codes of conduct tend to be instructions concerning behaviour and likely to be prescriptive and proscriptive. Conversely codes of ethics tend to be reasonably general in their tenor, encouraging employees to display particular characteristics such as loyalty, honesty, objectivity, probity and integrity (Fischer and Lovell, 2009). Although distinctions exist, a code of conduct can be widely interpreted as:

“A formal document containing a set of prescriptions developed by and for a company to guide present and future behavior on multiple issues of at least its managers and employees toward one another, the company, external stakeholders and society in general” (Kaptein and Schwartz, 2008:113).

Codes of conduct have become prominent in part due to the varying ethical scandals that have occurred, such as Enron (McKinney et al, 2010). It can be argued that the code attempts to encourage responsible behavior and avoid destructive consequences of unethical behavior (McKinney et al, 2010). However the codification of ethical standards does not always result in the desired outcome of better business ethics, as the introduction of a code may not be associated with a sincere intention to promote ethical behavior internally (Long and Driscoll, 2007).

2.2 Ethical Codes of Conduct in SMEs

The European Commission defines small and medium sized enterprises as those employing between 11 and 250 staff or having a turnover of between 2 and 30 million Euros (EC 2003). Codes of conduct are considered a formal way to measure CSR activity in MNCs (Hine and Preuss, 2008). However SME behaviour is often understood informally, in the terms of the psychological characteristics of the entrepreneur (Kruger, 2003). A number of empirical studies support this and empathise that the owner-manager values can be a decisive motivation for CSR in SMEs (Jenkins, 2006; Murillo and Lozano, 2006). Preuss and Perschke (2010) have identified five factors that differentiate organisations and their relationship to CSR, ownership, role of external stakeholders, managerial expertise, organisational complexity and market type. These five factors are considerably different between MNCs and SMEs.

Research suggests that small organisations often feel their size does not warrant a code of conduct, due to lack of demand for it and the perceived cost to implement (von Weltzien Hoivik and Shankar, 2010). In small organisations the owner/entrepreneur usually communicates the values and norms directly themselves without the need for a code (Kaptein, 2008; Crane and Matten, 2010). However, the smaller the organisation, the more readily a code can be developed and embedded (Kaptein, 2008:46). This might be as a result of an owner-manager not being pressurised by capital markets and shareholders (Thompson and Smith, 1991). Evidently an opportunity is apparent as SMEs can focus on local issues that benefit their community (Jenkins, 2004). Some small businesses may be disengaged from their communities as many owner-managers perceive themselves as being largely independent from their surroundings (Besser and Miller, 2004). There are several reasons for these phenomena. While an organisation is small, it can be perceived there is less reason for a code as communication is usually manageable. As the organisation gets bigger and more complex it is increasingly difficult to assume that everyone shares the same preconceptions about how a business should behave (Murray, 1997: 100). SMEs usually have one dominant

stakeholder or customer and therefore the demands made on them in CSR have less emphasis than in MNCs (Preuss and Perschke, 2010).

2.3 The Creation of Codes of Conduct

Lewis (2006) argues that managers create codes of conduct as a method to manage two sets of different risks, regulatory risks by offering potential alternative to public regulation, and social risks, as corporate codes attempt to answer to civil society's demand for more responsible businesses. Clegg (2006) highlights that codes remain insufficient to deal with many issues faced by organisations. Lewis (2006) ascertains that there are three reasons why codes of conduct come into existence:

1. Values – organisations generate their own values; they are also influenced by their member's values.
2. Reputation – The desire to protect both their company's reputation and their own may drive managers to adopt CSR codes.
3. Isomorphism and peer/partner pressure: Mimesis – explains how the adoption of CSR codes by a number of MNCs sends a signal to others that they should act similarly (Lewis, 2006:52).

Conversely, Weaver and Trevino (1999) have identified four orientations that organisations consider when creating a code of conduct. The compliance orientation has an emphasis on prevention and is a proactive approach. At this stage unethical behaviour is punished and prevention and detection are the prominent tools to assist ethical behaviour. The values orientation refers to codes that are based on self-governance and the application of general values and behaviours. External orientation refers to satisfying external stakeholders related to the organisation, for example customers and shareholders. Finally, protection orientation bases itself on protecting the top management from ethical and legal ramifications (Weaver and Trevino 1999). A mixture of these orientations may form the basis of the creations of codes. Paine (1994) suggests most companies adopt a values and compliance based orientation. Many ethical codes are simply a series of rules and regulations, which specify what employees should and should not do; this supports the compliance orientation view (Cassell et al., 1997). Alternatively, Stevens argues that it is culture and cooperation and not legal compliance that create the conditions for ethical codes to be effective (Stevens, 2008). This is supported by Trevino and Weaver (1999) who themselves conclude that codes do not work when used as control and compliance systems.

When the code is being formed it is usual for them to be based upon five to seven core ethical values or principles that the rest of the document is based, (Schwartz, 2004). Kaptein (2004) found that most codes described company responsibilities for product quality and services as well as obeying laws, protecting the environment and fairness. In general a code can vary in length but Schwartz, (2004) argues that the majority vary from 21-65 pages.

The importance of employee involvement in the creation stage has been assessed by Butcher (2003) who questions the way a small number of people can put forward a code that purports to apply to a large number of people. The relevance to every employee is important and different codes may be written for different employees and stakeholders, "Many of the codes of conduct introduced have been global or general in nature rather than local" (Cole, 2007:445). The creation stage is critical to attain buy in of the code, conversely when employees have not been involved in the development of the ethical code, they are not likely to consider it a useful document that encapsulates their shared moral values. Instead, they may regard the ethical code as a showpiece of top management and adopt a cynical view

towards it (Pater, 2003).

2.4 The Implementation and Communication of Ethical Codes of Conduct

Once a code is initiated the implementation stage is often poorly managed or in some instances missed, “keeping the code alive and preventing it from dying a quick or quiet death is often much more challenging in practice” (Kaptein, 2005: 8). A code is usually presented as a document, it is sometimes difficult to embed and can often be bypassed as unimportant. If regular staff did not have an input into its formation, this would also lead to entrenchment problems, “It is a challenge not only to communicate the content of a code, but especially to motivate employees to observe it and to equip them with the skills to uphold it and resolve their dilemmas” (Kaptein, 2008:8).

“Without external checks and balances, self-monitored rules are bound to remain inefficient” (Lewis, 2006:53). LeJeune agrees that staff must feel that the codes are representative of their role, “companies find it surprisingly difficult to translate the standards in their codes into examples or case studies that employees can take away and apply to their day to day existence” (LeJeune, cited in Balch, 2005). “Codes of conduct could be coupled with other regulatory instruments advocating the use of multiple regulatory instruments” (Crapo, 2004:351). Most large organisations now have their ethical codes of conduct presented on their website. This growing trend has meant that a code of conduct is expected but this may make their impact less effective. Bondy et al. (2004:466) suggest that burying codes of conduct in ‘the depths of their websites’ leads “one to question how transparent and important these codes are actually meant to be”.

Generally, the responsibility for rules and regulations is spread throughout the organisation. The formation of the code usually falls within the strategy department. Human resources and quality offices are then often occupied with the values of the organisation (Kaptein, 2008). Butcher (2003) questions why and how a small number of people (usually senior management) can put forward a code that purports to apply to a large number of people. Codes will be more fervently adopted if all staff are involved in the initial thinking process. Groups that have been allowed to participate in determining which provision should be included, how the code is formulated and communicated will seek to own the code (Garrod and Fennell, 2004). Stevens (2008) supports the importance of effective communication as well as culture as the driving force for an effective code, “If codes are embedded in the culture and embraced by the leaders, they are likely to be successful.” (Stevens, 2008:602)

3. Methodology

For the purpose of this investigation, a questionnaire was chosen to collect and analyse the data. This was selected for a number of reasons. The main aspect being that there is an emphasis on the generalisation of the results. However Zikmund argues “questionnaires provide quick, inexpensive, efficient and accurate means of assessing information about the population” (Zikmund, 2000:168). This is therefore a suitable data collection method for the aim of the research as general results will be obtained to establish the prevalence of codes of conduct in SMEs. Welman et al (2005) concur and emphasize that questionnaires are a suitable tool for collecting a range of data including demographic details, typical behaviours, attitudes and beliefs. As this research concerns ethics related topics and issues, the methodological process is vulnerable to social desirability bias and therefore great care must be taken when collecting data (Brunk 2010a: Mohr et al. 2001). As a result, a series of strategies were implemented to reduce social desirability bias. Barnett (1998) postulates that

when respondents are guaranteed anonymity, it is more likely that they will be honest and truthful. Hypothetical questions were included as well as those specific to the owner/managers businesses. This will hopefully eradicate the problem of desirability bias.

Questionnaires stem from the positivist research paradigm (May, 2001). However the questionnaire incorporated a mixed method approach because it included both open and closed questions, this mix of questions ensured a balanced and valid approach resulting in both qualitative and quantitative data (Wilson, 1998). Questionnaires are often classified as a deductive research method, however with the inclusion of open-ended questions it becomes more of an inductive research method (Gill and Johnson, 2010). The questionnaire incorporates a mixed method approach because it includes both open and closed questions. Combining both qualitative and quantitative approaches in the same data collection method is gaining acceptance and becoming more prevalent (Cameron and Molina-Azorin, 2011). An Additional benefit of employing internet questionnaires is that the answers can be more interactive and respondents are often more willing to disclose more information than they would over the phone or face-to-face (Taylor, 2000).

Likert scales were used in the questionnaire to collect data. Likert scales provide a range of answers and allow subjects to put their answer on an attitude continuum (May, 2001). If a middle option is included on the scale in questionnaires, research suggests that respondents are more likely to choose this option (Lietz, 2010). Taylor (2000) concurs and debates that online questionnaires can generate an increased number of respondents choosing the middle option if it is available. Based upon this evidence the researcher decided to adopt a 4-point Likert scale for some questions, which did not include the middle option. As it was expected that the sample would be small this ensured that all the responses were valid and decisive.

Therefore a sample of 30 organisations was chosen and written to. These organisations were all SMEs in the North-West area and were targeted from a database provided by the Salford Business School. It was hoped that organisations with prior links to the University might provide a higher response rate than from cold calling.

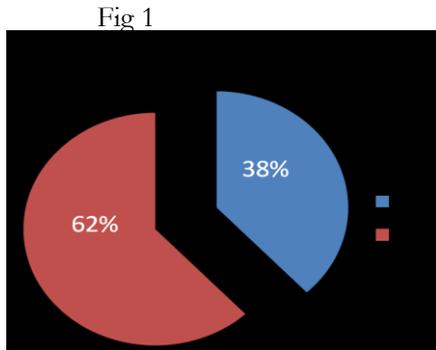
4. Findings and Analysis

In total 18 questionnaires were completed and returned by owner/managers of SME organisations. This was a return rate of 60%. The key findings are presented below. In depth analysis has been conducted for five of the questions. The questions asked will be presented in italics.

Does your organisation have formal written codes of ethical business practices? (Codes of Conduct)

Overall 62% of organisations claim to have some sort of formal written code of conduct (Fig 1). 38% state that there is no formal code, which is a high result considering an earlier question resulted in 100% of the companies claiming to be responsible. These results suggest that in some cases to be ethical you do not have to have formal code of conduct in SMEs. Conversely respondents may assume their company is responsible or want to portray it as ethical. This question does not ask about the intricacies of the scope and coverage of codes of conduct. The literature above states that codes of conduct are scant in SMEs however this result suggests otherwise.

Are your employees expected to sign a document signifying that they will adhere to ethical business principles?



67% of respondents stated that employees did not have to sign any formal document. Alternatively 33% indicated that they had to support and adhere to the code. This information depicts the opposite to the findings in the previous question. It highlights that although many of the SMEs do have codes of conduct, generally no procedures are in place to ensure compliance and acceptance of the codes by the signing a formal document.

Have employees of your organisation attended training courses on ethical business practices?

The results for this question can be found in figure 2. It is clear that for SMEs ethical training is undertaken by very few (15%). As 62% of respondents claim to have ethical procedures, these are generally not communicated via training. Most organisations (85%) stated that no ethics training was in place. Having established these quantitative data it would now be interesting to establish the amount and type of ethical training undertaken in organisations. It would be useful to investigate the level of personnel, within the organisation that attend ethical training, internally or externally. Who provides the training and development for small businesses and what is the content of such programmes are all areas that need exploring and are areas that need research.

Would you be willing to attend ethical business practices training, if made available?

77% of respondents would be willing to undertake ethical business practice training. This indicates an apparent market for training and development in this. Surprisingly 23% of respondents believe that training is not necessary. It is clear from figures 2 and 3 that although little training on ethical codes of conduct occurs there seems to be willingness and a requirement for it and the results are an almost inverse of one another.

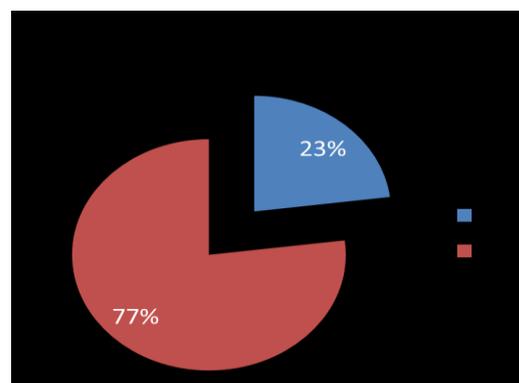
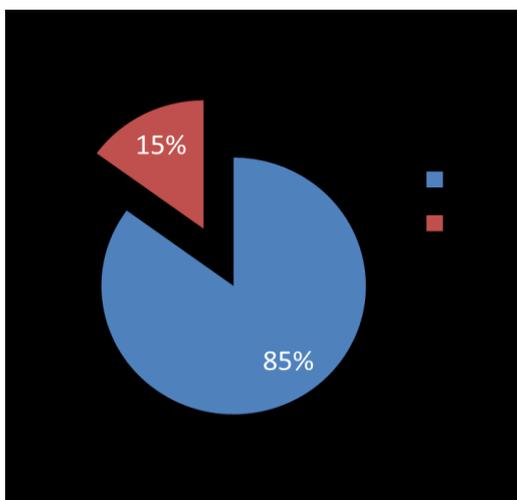


Fig. 3

At what stage do employees in your organisation receive information on ethical principles or codes of conduct?

46% of organisations indicated that ethical principles or codes of conduct are part of the induction training process. The question needs supplementing to include the on going updating of ethical codes of conduct and training. 11 organisations (84%) claim to provide formal information on ethical principles for their employees. 2 respondents (15%) claimed that employees did not receive information on this topic at all. However 3 respondents (23%), have continual ethical codes of conduct communication.

5. Conclusions and Further Research

The questionnaire findings suggest that, contrary to the literature, codes of conduct are prevalent and in operation in SMEs. It is evident from the data provided by the eighteen SMEs that codes of conduct are used in some extent in these organisations. These codes are either organisationally formed codes, adopted from larger organisations, industry codes or the prescribed values of the owner/managers. From the literature presented above, it is clear that the percentage of organisations using codes is increasing confirming that business ethics topics and more particularly codes of conduct are becoming more common. Therefore further research can be conducted to deduce how SME organisations develop their code from initial creation to execution as well as development. In order to achieve this a thorough case study approach could be adopted, assessing SMEs whose codes are at different stages such as creation, implementation and development.

In the majority of instances SME owner/managers do not require employees to acknowledge that they will follow ethical codes of conduct via signature, which poses a number of questions with respect to enforcement. Results from this question indicated that there is a distinction between creating a code and then actually disseminating and communicating it. Although many organisations have codes a considerable number are not fully utilised or 'alive' within the organisation. Usually senior management makes strategic decisions and therefore it is often them that creates the codes of conduct. By not ensuring that all employees sign to the code suggests that it is not considered important and that it will perhaps not be used as a formal document. To create a meaningful code responsibility must be maintained and all employees should be held accountable to it. Communication of the code is an area that requires more detailed research.

The results indicate that in SMEs there is limited training in regards to ethics and codes of conduct other than what is communicated by the owner/managers. However, there is a willingness to undertake training. Training of codes of conduct seems to be rare, yet there is clearly an opportunity for this to be developed in the future. Training is one way to ensure compliance and dissemination of the code and so this is research area that is currently underdeveloped. Content and delivery of the training of codes of conduct also needs further exploration

In the majority of instances the sampled SMEs provide code of conduct information at the employee induction stage, only three organisations claim to continuously provide information. Again this supports the conclusion above that there is scope for the development to ensure that codes become 'living' within the organisation and a programme is put in place to ensure regular training, compliance and development of the code throughout all levels of the organisation.

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Are Employment Tribunals a Barrier to Justice?

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Abstract

Two publications from the British Chamber of Commerce and Chartered Institute of Personnel and Development stated that the Employment Tribunal System is broken due to a number of reasons, including the amount of vexatious claims and the abuse of the system by claimants. The statements by the two employers organisations instigated an exploratory analysis of unfair dismissal claims from 1998 – 2011. The intention of the study is to analyse employment tribunals in respect of its purpose and whether the system is broken as purported by employers organisations. Through analysing users' perceptions of the Employment Tribunal Service, the intended outcome is to demonstrate that although there are problems with the system, it is not a barrier to justice and that it actually needs to be modernised to ensure that the service is accessible for people who have a dispute with an organisation.

Keywords:

Employment tribunal, justice, mixed methods study, unfair dismissal

1.1 The context of the research

The ETS, as it has been known since 1997, is an integral aspect to the application of employment law, and has facilitated a fluctuating increase in claims since the ETS was established in 1997. Figures from the ETS annual reports show 218,100 cases were taken to tribunal in 2010 – 2011 in comparison to 236,100 cases in 2009 – 2010 and 151,028 cases in 2008 – 2009. Although there was a 20% reduction in accepted tribunal claims in 2008 -2009, largely attributable to the airline employees as well as falling number of equal pay and sex discrimination claims, the actual number and proportion of single claims has risen in comparison to previous years, leading to additional workload for the tribunals. The table below outlines the figures from the creation of the ETS:

Table 1.1 Employment Tribunal Claims

Year	No. of Applications	No. of Single Claims
April 1997- March 1998	80,435	80,435
April 1998 - March 1999	91,913	148,771
April 1999 - March 2000	103,935	176,749
April 2000 - March 2001	130,408	218,101
April 2001- March 2002	112,227	194,120
April 2002- March 2003	98,617	172,322
April 2003- March 2004	115,042	197,365
April 2004- March 2005	86,189	156,081
April 2005- March 2006	115,039	201,514
April 2006 - March 2007	132,577	238,546
April 2007 - March 2008	189,303	296,963
April 2008 - March 2009	151,028	266,542
April 2009 - March 2010	236,100	392,700
April 2010 – March 2011	218,100	382,400

Industrial Tribunals (as they were originally known) were initially established under s.12 of the Industrial Training Act (1964) for the purpose of considering appeals by employers against training levies imposed under that Act. Through the researcher’s own experiences and a review of the current literature, it has been noted that the tribunal system has evolved over the last five decades into a complex and formal process that has detracted from its origins as an informal mediation service.

1.2 Aim of the research

The study has the aim of analysing unfair dismissal claims from 1998 – 2011, establish whether the tribunal system is a barrier to justice. The aim of the study will be met through the following:

- Analysing the whole ETS process, including the original vision, mission and intended purpose of the service
- Evaluating how the service has evolved over the last five decades and also what issues have influenced their current model including their impact upon the management of employment relationships
- Analysing tribunals in the context of their regulation of employment law and the control of individual, management and organised labour power

1.3 Research hypothesis

Are Employment Tribunals unfair on employers? A mixed method study.

The research presumes that there are challenges and concerns with the ETS, it has evolved since its inception and will continue to do so in the future. For the benefit of this study, the term ETS has been used to refer to those services provided by the government in mediating employment disputes.

1.4 Importance of the study

Tribunal figures have shown that the use of the service has increased substantially over the last decade in spite of legislative procedures being introduced, which have been designed to reduce recourse to tribunals. The service is an integral aspect to employment law and also an important mediator in disputes between claimants and respondents (including prospective workers). Therefore it is essential that this service supports and benefits all individuals involved so that a resolution can be made in the most efficient, effective, reasonable and inexpensive way possible.

This research will complement existing literature as well as contribute towards the factors that will shape, evolve and develop the model and processes of the ETS. In particular this study will differ from previous ones in that it will not focus purely on empirical data, collected as part of a governmental research series, but will explore the real thoughts and opinions of users of the service. As outlined in chapter two, previous research has tended to focus too much on the statistical aspect to the ETS or how claimants are treated inappropriately. This study will extend beyond the standard analysis of the ETS and provide a unique insight into the affects and ramifications of tribunals on the employer / employee relationship.

2.1 The employment relationship and the law

The relationship between the employer and the employee has changed considerably since the middle of the 19th Century, with the commencement of the Industrial Revolution and with the emergence of capitalism facilitating this change. Burgess (1980) commented that this has resulted in the change of relationship between employer and employee, shifting from traditional forms based on status e.g. servitude, to one that forms the notion of a contractual relationship, 'although workers were not as 'free' as portrayed, they were clearly emancipated compared to conditions suffered under previous regimes' (Thomason, 1984:2). Historically, markets had not penetrated the pre-industrial skilled trades, which worked on a customary basis of wage bargaining rather than aligning this with the demands of the markets. Therefore traditional craft skilled workers had more control over their own wage bargaining process and had limited restraints, on exploitation of their labour, due to the customs and practice of the trade over the decades.

With the increase in factory based production within key sectors, such as textiles and engineering, this enabled employers to reframe the principles of determination of pay, based on the market conditions (Burgess, 1980).

3.1 The introduction of ‘law courts’

The Donovan Commission had severe reservations regarding the efficiency, effectiveness and also appropriateness of Industrial Tribunals, stating that, ‘The Multiplicity of jurisdictions is apt to lead to waste, to frustration and to delay’ (The Royal Commission on Trade Unions and Employers’ Associations 1965 – 1968: para 570).

This example supported the commission’s recommendations:

...that industrial tribunals should be enlarged so as to comprise all disputes between the industrial worker and his employer... not only overcome the present multiplicity of jurisdictions ...also...produce a procedure which is easily accessible, informal, speedy and inexpensive, and which gives them the best possible opportunities of arriving at an amicable settlement of their differences (The Royal Commission on Trade Unions and Employers’ Associations 1965 – 1968: para. 572).

The Donovan Commission seemed to have a utopian vision of ETs and how they should be designed, developed and delivered. This vision may have concentrated too much on the future and failed to address the underlying current problems with ETs. To understand Donovan’s recommendations, it is appropriate to identify and evaluate the key elements of their report. The recommendations can be segmented into the following sections:

- Easily Accessible
- Informal
- Speedy
- Inexpensive

Easily Accessible

A key aspect of the Donovan Commission’s recommendations and problems with the current system was the accessibility of hearings. The Donovan Commission envisaged ‘that they will be operating in all major industrial centres and thus easily accessible’ (The Royal Commission on Trade Unions and Employers’ Associations 1965 – 1968: para. 548). This not only had the premise that both the employer and the employee could access a tribunal in their area rather than some considerable distance away, but would also speed up the process of resolving the dispute.

Informal

The Donovan Commission’s ideal for having an ‘informal’ ET structure was divided into two segments. Firstly, they wanted the whole ET to have a more informal approach, from the application process to the hearings and judgements. Secondly the Commission wanted an informal approach to the resolution of disputes, through having a pre-hearing. This sought to have the obvious benefit of resolving the dispute in a setting away from the more formal ET.

Speedy

The idealology of a speedy ETS is linked to the area of developing an informal approach, as a rapid resolution of the dispute would be addressed through an informal pre-hearing. It can also be linked to the process of an ET hearing being informal, as ET 'court rooms' are far less formal than other court systems. For example there are no wigs or gowns and the rooms, where disputes are heard, are considerably less imposing. At criminal courts for example, both parties are expected to present their case and challenge the case of the opposite side. At the commencement of ET's, the Chair was expected to support either side in ensuring all of the relevant facts were presented and communicated clearly. Through an 'informal' process, employees with a dispute would be able to apply to an ET and have this resolved (either to the benefit of the employee or employer) in a reasonably speedy timeframe, in comparison to other courts.

Inexpensive

As well as the ideal of ETs being reconciled in a speedy fashion, the Donovan Commission envisaged them to be inexpensive. What the Donovan Commission were referring when they stated 'inexpensive' is subjective, but can be interpreted that it would be inexpensive for the parties involved, the employee and employer. Therefore it is possible to interpret this recommendation this way as the Donovan Commission had made a number of proposals which would have severely increased the cost for the government, such as the recommendation to create more ET hearing 'courts', across a increased number of towns and cities.

3.2 The Employment Tribunal Service

Previous sections in this study have discussed the creation and development of ETs, therefore this section will concentrate on the impact and effectiveness of the service. Lord Wedderburn's speech in the House of Lords (Wedderburn, 2009) regarding the composition of the ETS is evidence that the discussion around the service is still prevalent and necessary to ensure the service continues to develop and fit the needs of a modern employment relationship.

3.3 Impact of tribunals on the way employers manage relationships

The use of employment legislation and the ETS has always been viewed disparagingly by employers. Evans et al., (1985) states that although a fairly muted response was received in 1971, when unfair dismissal was first introduced, employers were more vociferous when legislation and the remit of ET's were extended in 1975. Objections raised at the time, which look very familiar in today's workplace, included they would be a deterrent to job creation, tactics would be used to avoid legislation (for example temporary contracts) and an increase in bureaucracy. A study at the time by Clifton and Tatton-Brown (1979) countered this notion and in fact demonstrated that they had little or no impact on firms. In the study, 4% of companies suggested that this had an impact upon their business, and rated lowly in a list of main difficulties in running a business. However, an interesting factor of this study was that it reiterated that small businesses were largely ignorant of the law. Although, over the last four decades, this has changed, with data from the Workplace Industrial Relations Survey (2004), finding that 76% of companies had a disciplinary and grievance procedure in place. This can

be associated to the introduction of a raft of employment legislation, a rigid process for following disciplinary and grievances, and the threat of a costly visit to an ET.

As previously discussed, the original master-servant contract and the fundamental inequity in that relationship has resulted in an attempt to try to and rectify the disparity. The establishment of employee rights and the removal of legal constraints on collective bargaining have changed the nature of employment relations. Although legislation has been in place since the late 19th Century, it was not until the 1970's, and the creation of ETs that protection for employees was realistic. Gennard and Judge (2010:273) relate the protection back to the Industrial Relations Act (1971) stating that:

...the act gave individual employees the right, for the first time, to complain to an industrial tribunal that they had been unfairly dismissed. The 1971 act was a turning-point in the relationship between employer and employee. The relative informality of the then industrial tribunals and the fact that access to them did not depend on lawyers or money meant that for many employee the threat of dismissal without good reason disappeared or diminished.

Gennard and Judge (2010:273) go on to counter this by warning:

...this does not mean that employees cannot be unfairly dismissed. They can. The law has never removed from management the ability to dismiss who it likes, when it likes, and for whatever reason it likes. All that has happened since 1971 is that where employers are deemed to have acted unreasonably and unfairly in dismissing employees, they can be forced to compensate an individual for the consequences of those actions.

The commentary by Gennard and Judge provides a salient discussion around the impact and influence of the ETS on how employers manage and relate to staff members. Despite the protection and threat of a tribunal, employers are still dealing with employees in a fashion that was in effect prior to the creation of tribunals. Employers still argue that the relationship with their employees should remain private and any disputes should not be dealt with in a public arena. Rowlinson (1993:133) concurs:

...management are the law makers, they draw up the laws in private, and largely to protect their own interests rather than those of all the members of the organisation. It is hardly surprising, therefore, that discipline has been called a very private system of justice.

An ET therefore will measure whether 'natural justice' has taken place. Employment law has formalised the ideologies of natural justice, into a rigid framework that employers have to adhere and therefore natural justice has been supplanted into employment legislation, whereby the action of the employer in dealing with the employee is measured just as highly, if not more so, than the actual actions or non actions of the employee. The threat of an ET has resulted in employers not being able to act 'instinctively', but forcing them to follow set procedures. This is also applicable for employees who are also pressed into following set, rigid procedures before being able to apply to an ET or have their potential award reduced by up to 25%. The employee may feel uncomfortable in raising the issue with their employer due to the possible implications and therefore would prefer the tribunal to deal with the

issue(s). The ETS therefore have tried to regulate the employment relationship, which in some cases can be detrimental to both parties.

3.4 Impact of tribunals on employees in seeking to resolve conflict

Although it can be argued that with the advent of ETs a new raft of ‘disputes’ have arisen, some commentators have linked the rise in applications to tribunals over the last four decades to the decline in trade union power (Shackleton, 2002). Drinkwater and Ingram (2005) argued the use of tribunals was a reaction to the purification of collective action, due to the difficulty experienced by trade unions in being able to organise and act collectively. A clear accusation is that tribunals offer a new avenue of resolution for the same conflict, which would have previously been voiced through collective action.

There is a clear correlation between the increase in ET applications and a decrease in trade union membership. Numerous writers have substantiated this and agreed that the fall in trade union membership and therefore a relaxation in collective agreements, has been affected by the individualisation of the employment relationship (Kelly, 1998; Brown et al., 1998; Hawes, 2000). With the decrease in trade union membership, employees have therefore used ETs to resolve any disputes they may have. However, the nature of resolving conflict through a trade union or an ET is radically different. For example, an ET will ask the claimant what remedy or remedies they are seeking, with three options:

1. To get their old job back and compensation (reinstatement).
2. To get another job with the same employer and compensation (re-engagement).
3. Compensation only.

There could be a change in this idea though, as Gibbons (2007), states there is a growth in the number of multiple tribunal cases involving a single issue (or set of issues) which are or have affected a number of employees in the same workplace. Gibbons (2007:98) attributes the increase in multiple cases, ‘directly to collective issues, with the rate of such cases fluctuating substantially because it is heavily influenced by large scale disputes’. Gall and Hebdon (2008) labelled this ‘semi- collective action’ and is estimated to cost employers £3 billion and predicted to rise to £5 billion with base pay liabilities and future wage bills (Fuller, 2007). The recent case of Birmingham City Council being taken to an ET, compounds this theory. In the case of *Baker and others v Birmingham City Council* (ET 1305819/2006), more than 4,000 female workers won their equal pay claim in an ET. The female employees were employed across 49 different job, which were traditionally dominated by females, including cleaners, carers, cooks, care assistants and teaching assistants, and were on the same pay grade as men. They complained of being excluded from bonuses worth up to 160% of their basic pay which were paid to men. The workers were represented by different organisations, for example 900 were represented by Steton Cross Solicitors. Historically, a dispute like this would have involved trade union negotiations and possible industrial action. The fact that the amount of compensation sought was large (£200 Million) resulted in the employees taking action which they knew was the only option open to achieve the compensation sought.

Batstone’s (1977) assertion that strikes were a tactical extension of ‘collective opposition’ can therefore be assimilated to the use of ETs, as in the case of Birmingham City Council, when an initial grievance was raised and refuted regarding the issue of equal pay. The application to the tribunal service is the obvious next step in the tactics of employees to resolve their dispute. Metcalf (2003) disagrees with this, and concludes that the use of

tribunals is a necessity due to the restrictions placed on trade unions by the Conservative government (1979-1997):

...the strike threat...was weakened by a succession of laws which permitted a union to be sued, introduced ballots prior to a strike, and outlawed both secondary an unofficial action (Metcalf, 2003:175).

The policies of the Conservative government continued with the successive Labour governments (1997- 2010), which decided to continue with the same policy, stating that:

...there will be no going back, the days of strikes without ballots, mass picketing, closed shops and secondary action are over” (Department for Trade and Industry, Fairness at Work, 1998:98).

With Labour (1997-2010) continuing with restrictive practice policies on trade unions, ETs have developed into the only viable option for employees to try and resolve their disputes. The explosion in individual employment rights (Dickens, 2000) has now swept into the realm of employment relations, ‘which had previously been a matter of voluntary determination’ (Dickens and Neal, 2006:7). With the implementation of the Statutory Disciplinary and Grievance Procedures (2004), employers and employees were effectively forced into channelling disputes into a set, rigid process. Even though this has been repealed after the Gibbons Review and replaced with the semi-mandatory Acas Code of Practice (2009), (implemented through the Employment Act, 2008) organisations and employees are still advised to follow the process formalised in the Statutory Disciplinary and Grievance Process (2004), with the added threat of awards at tribunals being reduced or increased by 25% if the correct processes are not followed.

It has been suggested though that the impact of the procedural changes, brought in through the Employment Act (2002), has downgraded rather than enhanced procedural fairness (Hepple and Morris, 2002). Although the procedures have been updated to mirror the Acas Code of Practice (2009), Hepple and Morris (2002) still argued that even though these set processes are in place, employers could follow the statutory procedure and could escape a finding of unfair dismissal on the grounds that procedural defects would have made ‘no difference’ to the decision to dismiss. Knowing this, employees may feel that applying to a tribunal would therefore be futile. Kelly (2008) argues that the overall growth in tribunal claims indicates rising levels of discontent at work. However, only a minute fraction of grievances that could result in a tribunal claim, actually result in this action being taken, with only a quarter advancing to an actual hearing. Brendan Barber from the Trade Union Congress (TUC) is quoted in EIRO (2001:9) as stating:

I am fed up listening to employers griping about a so called compensation culture. Tribunal claims do not arise because sacked workers are ‘having a punt’. Only around 30,000 claims a year go to a full tribunal hearing. Meanwhile, as many as three-quarters of a million times a year employers get away with actions that could land them in a tribunal. That is the real scandal.

There is an argument that the sector in which a person works can affect the application to a tribunal. Dickens (2000:34) bluntly states that:

...the number of people employed in those parts of the private services sector, where the management of employment relations is often conducted in a harsh and arbitrary manner by small employers and unions are weak, is generating more claims.

Another problem with ETs involves the stigma attached to the person who has submitted an application against their employer. As tribunals publish most case information in the public arena (except for ‘restricted reporting’ cases) it is possible for prospective employers to determine whether someone has submitted tribunal applications previously, which would the ‘warn them off’ and not employ them. The TUC’s (2008) commission on vulnerable employment reported that workers:

...are stopped by fear that even though they might have the strongest case in the world, once the next employer who they got finds out they took the previous employer to the tribunal, the chances of getting a job go out of the window (TUC 2008:132).

3.5 The costs and benefits of tribunals

Analysing the costs associated with the tribunal system is a difficult and controversial task (Shackleton, 2002) and there is a need to distinguish the various diverse notions of cost. An analysis of the tangible direct cost involved in operating the ETS is outlined below and in accordance with guidance from Shackleton (2002), a further analysis of other direct costs (i.e ACAS) and also compensation, compliance and indirect costs’ will be provided during the secondary analysis.

Table 3.1 Employment Tribunal Service Income and Expenditure

	2006/07	2007/08	2008/09	2009/10
	£000's	£000's	£000's	£000's
Income	£22	£35	£12	£0
Administrative Staffing Costs	£15,338	£14,630	£15,091	£15,781
Accommodation costs	£13,415	£14,100	£12,791	£14,777
Administrative overheads	£11,556	£11,229	£11,084	£14,291
Hearing costs (including Judicial Salaries / Fees)	£30,762	£35,051	£36,915	£39,541
Total Expenditure	£71,049	£74,975	£75,869	£84,390

4.1 Research Design

In selecting the most appropriate research design the following three elements will be considered:

- The research problem
- Personal experiences
- Audience

Certain types of social research problems require specific approaches (Creswell, 2009). If a concept or phenomenon needs to be appreciated due to little or no research being available, then the most appropriate approach would be qualitative methods. If the problem prompts the following:-

- The identification of factors that influence an outcome
- The utility of an intervention or
- Understanding the best predictors of outcomes

then the quantitative approach is the most appropriate method. The mixed method approach would be used to ‘understand’ a problem in a clearer way and better way, as it utilises the strengths of both approaches. Therefore the research problem should influence the whole design of the study.

It has previously been discussed that the researcher’s own education, training and most importantly experiences has influenced the approach to their research. Some researchers will be trained in the fundamentals of quantitative research which requires a more technical, scientific and statistical set of skills to conduct the research, in comparison to broad ‘literary’ skills and observations required for qualitative research. It is not only the skills that the researcher possesses that are important, but also the recognised limitations of the researcher as well. As quantitative research is highly structured and works within a defined set of rules, the researcher may be more comfortable in challenging ideas and themes, within the format, rather than having a less rigid framework to rely upon and to substantiate with. Qualitative approaches do allow flexibility with a research framework, but the researcher must be comfortable in using this approach.

As this study is supervised and assessed by academics in the chosen topic area and also in research practices, the approach should be centred around the requirements of assessment, the areas of research required within the research centre and also for potential researchers in the future, who may use this study to develop new fields of analysis and develop the topic even further.

4.2 Research process and framework

Within the research process two questions need to be addressed, firstly, what will be the methodology or methods of the research and secondly, what is the justification for the choice of methodology and methods utilised?

To answer these questions, Crotty (1998:3) has developed four questions and themes, which are:

- 1- What methods do we propose to use?
- 2- What methodology governs our choice and use of methods?
- 3- What theoretical perspective lies behind the methodology in question?
- 4- What epistemology informs this theoretical perspective?

4.3 Research design - The triangulation design

Denzin (1978:291) defined triangulation as “the combination of methodologies in the study of the same phenomenon” and is based on the triangulation metaphor from navigation and military strategy which, according to Smith, (1975), uses multiple reference points to locate an object’s exact position. Within the field of social sciences, triangulation can be attributed to Campbell and Fiske (1959), who devised the theory of ‘multiple operationism’. An example of how this work within the field of management is through appraisals. A manager’s effectiveness could be assessed through a one to one interview, an evaluation of performance record and a ‘peer review’. Although the focus remains on the effectiveness of the manager, the method of data collection varies. Jick (1979) used the triangulation strategy to study the effects of a merger on employees over a period of fourteen months. To achieve multiple viewpoints, three observational approaches were utilised; feelings and behaviours, direct and indirect reports, obtrusive and unobtrusive observations. The main reason for using the triangular design, is for the researcher to, either directly compare and contrast qualitative and quantitative information or to substantiate or develop quantitative results with qualitative data. Creswell and Plano Clark (2007) have devised a triangular design which demonstration how quantitative and qualitative methods are used within the same timeframe and adopt equal weighting.

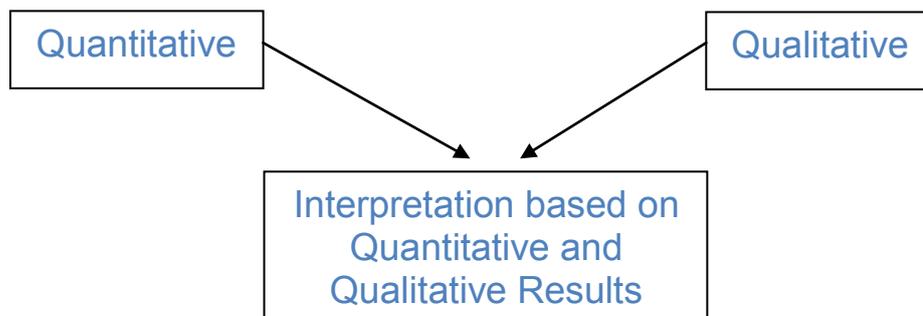


Fig. 4.2 - The triangulation design

The triangulation design has been labelled the ‘concurrent triangulation design’ by Creswell, Plano Clark et al., (2003) due to its single phase nature and timing. To best understand the problem or phenomenon, the research will collect qualitative and quantitative data separately but in tandem, and then proceed to merge the two data sets. The merging of data can be done through interpreting the data collectively or by “transforming data to facilitate integrating the two data types during the analysis” Creswell and Plano Clark, 2007:64). An example of this type of research can be viewed in Jenkin’s (2001) single phase study regarding ‘Rural Adolescent Perceptions of Alcohol and other Drug Resistance’. Qualitative data was collected in the form of focus groups and quantitative data through semi-structured questionnaires. The two data sets were then interpreted by relating the qualitative results in the qualitative findings

Mixed Method Approach - The convergence model approach

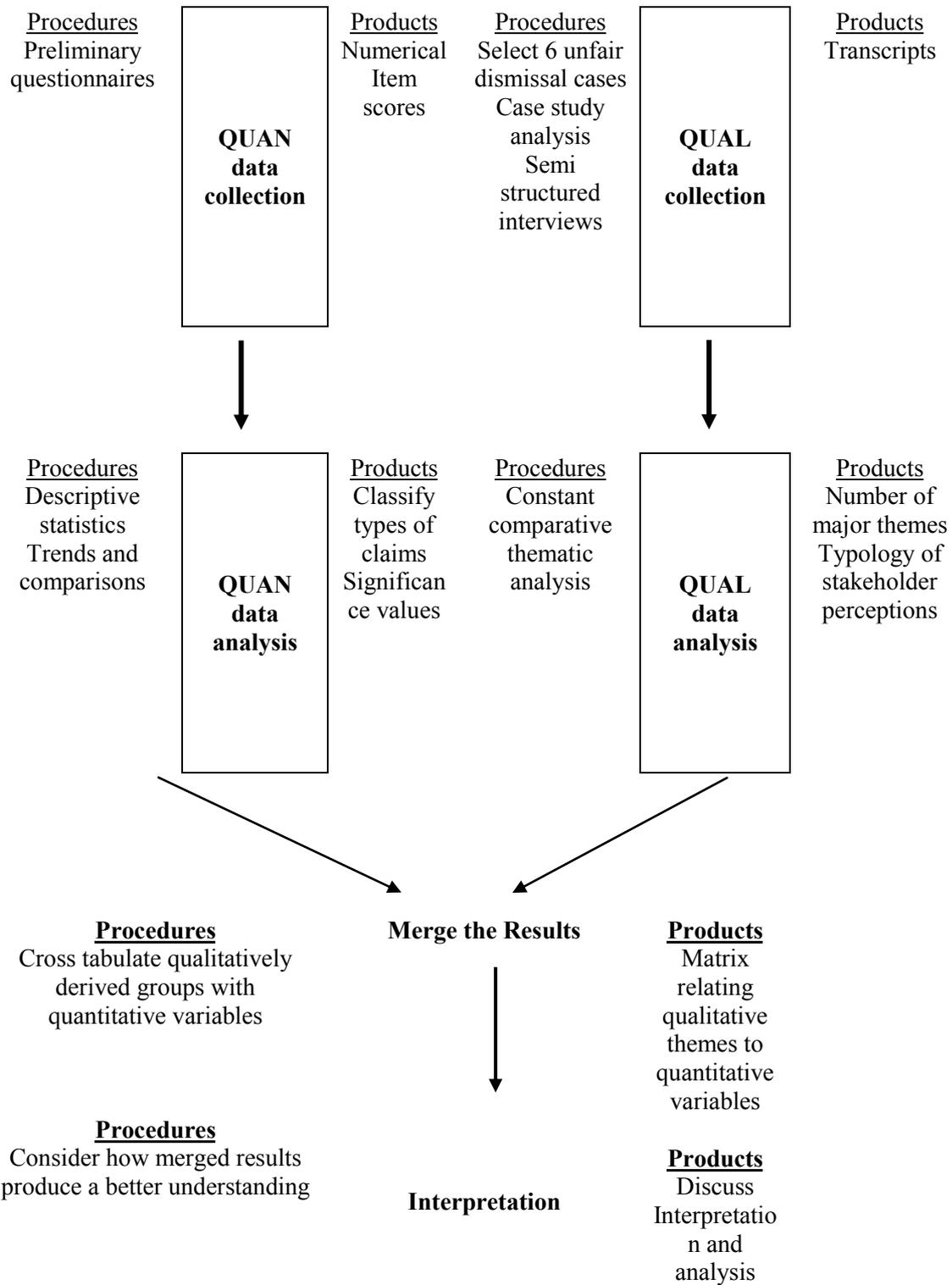


Figure 4.3 – Mixed Method Approach: The convergence Model

5.1 Future research activity

This piece of research will be used as a platform to build on the findings and knowledge gained from the information produced from the study. The researcher has a specific interest in employment legislation, in particular the practical implementation of legislation into work places. Therefore the researcher envisages further research being carried out around this topic area, with a number of themes identified for future research:

- The use of technology within the tribunal system
- The changing requirements of employment legislation, in relation to the different permutations that people are now employed or contracted for work
- The impact of the Equality Act (2010): once a relative active period has passed, the researcher intends to analyse, through tribunal judgements, how this huge piece of legislation has affected employers and employees.

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Entrepreneurial Snap-Decision Making: The SNAP-Decision Theory

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Living is a constant process of deciding what we are going to do.

Jose Ortega.

Abstract:

The longitudinal case study in this thesis maintains that decision making *defines what it is to be human*. Defining what a decision is, and mapping the decision-making process generates a frame of reference. The core aim has been to deepen understanding of *how and why effective snap-decisions work*. Snap-decisions are phenomena that have eluded satisfactory description. Current research topics such as indecision and information overload are addressed through an analysis of the questions Gladwell (2005; 2006) raises in his book, 'Blink'.

'Blink' is also a term, coined within snap-decision-making parlance. Gladwell maintains that a snap-decision is one made 'in the blink of an eye' A snap-decision made in blink implies an unconscious action whereby decision-making attention is effortlessly refreshed and re-focused. Snap-decisions are natural, iterative human behaviours. Articulating awareness of the 'blink' moment is a central issue in the study; and has proved a rigorous methodological challenge.

To gain an understanding of how snap-decisions are experienced has involved the research covering the world of entrepreneurial mind-sets. The study is underpinned by an ongoing longitudinal case study conducted over its duration, a four year period to date. It is two supported by two further completed case studies, along with 10 in-depth interviews. A wealth of rich qualitative data has been generated, which, with quantitative treatment, achieves a broadly based methods approach.

The results are the development of a theory of the phenomenon 'S.N.A.P.', as defined within the snap-decision making process. S.N.A.P. represents an approach, a way of decision-making whereby spontaneous, natural awareness with purpose is engaged to effect momentum to complete the process with an associated action. The SNAP-Decision Making Theory maps the process and elements while conceptualising the 'S.N.A.P.' moment. Factors, themes and influences have been identified and defined as facilitators or inhibitors within snap-decision making. The theory is underpinned with a Conceptual Framework and a Taxonomy of Terms.

The research has adopted Grounded Theory (GT) and Natural Decision Making (NDM) research traditions to generate and analyse data from entrepreneurs in their day-to-day activities. Entrepreneurs have been selected using specified criteria based on experience, lifestyle and self-referencing.

Keywords

‘Blink’, entrepreneurial decision making, snap-decisions, snap-decision-making, SNAP-decision-making theory.

Introduction

‘He who has a choice has trouble’

Dutch proverb.

Decision-making is more than just making choices. We are not ordinarily aware of the continuous and iterative decision-making activities engaging our subconscious and conscious minds. One decision flows from and to, another. We cannot afford the overhead of conscious thinking about every decision-making process. When asked, *‘what do you experience when you make a snap-decision?’* most study subjects found themselves initially unable to articulate the processes they use.

The relationship between thinking, language and the conscious and unconscious streams of awareness is examined within this study. In doing so, unforeseen barriers and obstacles appeared, forced by the need for rational explanation of seemingly ‘irrational’ internal processes. Study subjects have, one and all, struggled with themselves and their thinking in trying to recall what happens to them when they make a snap-decision. This was not unexpected, but it presented a methodological challenge in terms of knowledge and experiential elicitation. The researchers’ Problem Based Learning (PBL) experience as a tutor/facilitator proved invaluable in teasing out issues, concepts and themes, while providing a supportive platform and prompt to visual ideation, mind-mapping and creative lateral thinking, including metaphor (Sternberg, 1990; Goatly, 1997).

Using language to mediate and convey the snap-decision making experience has meant negotiating what Frege (the linguistic philosopher) identified as a classic paradox, namely that *‘Language is both a fetter and a tool’* (Poli, 2010). Wittgenstein expressed another core challenge in accessing human experience and tacit understanding while having to negotiate the problem of translating thought through, language: *‘Whereof one cannot speak, thereof one must pass over in silence’* (Kenny, 2005).

The discussion regarding language and meaning brings into focus the core challenge of this study: the valid elicitation of experiential perceptions and reflections. This includes internalised mental and subconscious routines. The research has used alternative techniques to break through this barrier, and ensure consistent integrity of subject responses. Methodology techniques have included visualisation, metaphor and story-boarding to capture lateral thinking, conceptual mind-mapping and cognitive mapping.

As a phenomenon, snap-decisions are experienced, rather than controlled or consciously engaged. We feel and make snap-decisions; they rise from the subconscious, like a cloud of feelings and emotions that materialise as a sense of ‘knowing’ in consciousness. Often, the snap-decision experience is combined with *a sense of déjà vu*; as recognition of previous decision situations, perceptual patterns and shapes of decision-making cues emerge (Tversky, and Kahneman, 1977). *This study argues that understanding this recognition value lies at the heart of effective snap-decision making.* It argues that the decision-making variables, context and situation are recognised in a single first-impression sweep, as a holistic flow. It fully engages the five senses; it draws on the experience, intuition and insight (Klein, 1998) shaped from repeated exposures to similar and experienced decision making contexts. In ‘Blink’

(Gladwell, 2005), an art historian justified his snap-decision and judgement on the dismissal of the authenticity of the Kuros marbles with the feeling of *'intuitive repulsion'*.

This account of a snap-decision made in a 'blink' defies the logic favoured by traditionalist approaches to decision-making. Yet, the snap-decision made by the art historian proved more reliable than the judgement and decision made by a battery of scientific experts after months of deliberation, and comprehensive information and resources made available. The art historian demonstrated the power of *'thin-slicing'* (minimal exposure to information) and *'rapid-cognition'* (engaging unconscious thinking and emotional streams) to deliver a decision in a blink.

In order to access similar snap-decision experiences, this study has adopted a methodology with an experiential and empirical research paradigm (Hussey and Hussey, 1997). The research has been conducted through an Interpretivism paradigm (i.e. social constructionism). Where *social 'reality' cannot be objective*, but rather is subjective, constructed and imbued with meaning through individual perspectives. Understanding of phenomena is forged through joint-ventures of exploration, discussion and adaptive behaviours of terms and experiences. This Interpretivism is socially constructed by focusing on the ways that study subjects make sense of their own world, and the decision-making they engage within. Sharing and empathising with decision-making experiences is core to this study's methodological philosophy, as is the shared interpretation of that described (Collis and Hussy 2009; Easterby-Smith *et al.*, 2008).

This study is case study driven (Yin, 2009), using following traditions from Grounded Theory (GT), (Glaser and Strauss, 1967; Strauss and Corbin, 1998) and Natural Decision Making (NDM), (Creswell, 1994; Orasanu *et al* 1993; Zsombok and Klein, 1997). These traditions emphasise naturalistic, experiential immersion within the behaviour and processes being researched.

Entrepreneurial snap-decision-making

Snap-decision makers are characterised as being primed for action. The snap-decision itself is the first half of the decision-making equation (i.e. a decision has been made); to qualify as a snap-decision within the terms of reference for this study, the decision must be followed by a definable *action*. This action takes the form of an identifiable and measurable change in the maker. It can be external (e.g. an observable behaviour) or internal (e.g. a change of attitude). Entrepreneurial snap-decision making (Gustafsson, 2006) is about opportunistic awareness (Vaghely and Julien, 2008), momentum, flow (Csikszentmihalyi, 2002) and action (Welch; Robbins, 1994). It is about being in the present moment, and of being aware of all potentials in the 'Now' (Tolle, 1999). It is about having *an entrepreneurial mind-set* that is characterised by *spontaneous, natural awareness with purpose (S.N.A.P.)*.

Snap-decisions operate in the realm of the subconscious levels; combining intuition (Dane, 2007) with emotional drivers (Frijda *et al*, 2000; Simon, 1987) that feed confidence and belief. Typically, snap-decisions result in the maker feeling and believing they have accessed insight and wisdom: *they just 'know' it's right*. Most importantly, *they have made a decision*; crossed 'the line', and this achievement renders huge potential benefits in creating momentum and being productive.

Language, thinking and snap-decisions

In thinking about decision-making, we expose the inadequacies of conscious thought, conversion of thought into language (an assumption), human consciousness, cognitive rationality and our vulnerability to emotional and affective influences. Thinking about how

we make decisions entails forensic examination of our struggle to explain or justify decisions.

Decision-making remains for most part an inaccessible phenomenon, despite decades of scientific research, statistical analysis and computing power. It remains a frontier of understanding as to what it is to be 'human'. We all operate with inherent biases, and make even the most fundamental 'errors' when making decisions (Ariely, 2009). This study seeks to address these issues.

Snap-decisions cut through these barriers to deliver with devastating speed a conclusion. Typically subjects explain this with statements like, "*I just know when it's right*". It is this '*knowing*', comprised from a set of hard-won heuristics, a compiled stack of worldly wisdoms that generates the shortest decision-making route to a solution (Gigerenzer et al, 1999). This study sets out to describe and explain this process through its theory of a 'S.N.A.P.': a decision-making moment (Mitchell et al, 2005) when a change occurs at many levels, and simultaneously. *It is a point of 'knowing'*.

The research question

This study addresses the research question:

What is the 'snap' in a snap-decision?

To answer this question, it postulates a theory of the entrepreneurial snap-decision-making process.

The researcher has conducted a longitudinal case study with two supporting completed case studies, and ten in-depth interviews with leading UK entrepreneurs. The study seeks new insights, rich descriptions and a re-definition of the way we describe and explain the decision-making process. It seeks to be valid and reliable in its methodology and challenging and innovative in the interpretation of its findings. It seeks to help our understanding of the decision-making process, the nature of decisions, and what happens when we make snap-decisions by addressing these underlying questions:

What happens when entrepreneurs 'snap' into a 'snap-decision'?

What happens in the 'blink' of an eye?

Why this study promises original contribution

In addressing these questions, the study has potential to address issues raised in current decision making research such as the studies of Moore (2011), and Bradley (2010). At the same time, this study highlights key areas for potential further research, in particular the areas of decision-making pattern-recognition; the role of experience; and emotional factors affecting the effectiveness of snap-decision making.

Shortcomings in traditional decision making theory

Traditional decision-making approaches have proved inadequate on many levels (Beach et al., 1993; Simon, 1987; Edwards et al., 1967; Orasanu et al., 1993). Many theories make many false assumptions; they seem divorced from reality, and are driven by scientific methods with linear thinking dominating research landscapes. They fail in one critical area identified within the Naturalistic Decision Making Methodology: rationalistic models are of

limited practical value when entrepreneurs are faced with time-pressures and high risk uncertainties, while operating within dynamic environments. Sharp-end decision-makers, business people and entrepreneurs often struggle to engage with academic versions of decision-making. There is a credibility gap between entrepreneurial reality and scholarly attempts to distil or capture an idealised decision making model. The deficiencies can be listed in terms of the following factors identified in this study in the decision-making process:

1. Rationality dominates.
2. Cognitive processes drive the process.
3. Linear sequences of thinking are the norm.
4. Modelling is based on computing or algorithmic analogies.
5. Emotion-less thinking is assumed.
6. Human motivations and personal agendas are not considered.
7. Context-less analysis.
8. The 'human' element is divorced from the process. Feelings and emotions are assumed to be a negative influence.
9. Omission of the role of experience, intuition, 'gut' (Gigerenzer, 2007) and insight.
10. Omission of the inherent risk-analysis that humans instinctively make.
11. No accounting for prediction, hunches and 'educated guesses', elements of decision-making learning.
12. Individuals learn through trial and error, an essential role in improving decision-making skills.
13. Heuristic seeking behaviour (taking short-cuts, Gigerenzer et al. 1999) is essential in responses to pressure. These responses are difficult to predict, let alone represent.
14. No allowances for time pressure.
15. Assumes decisions are actually made as a result of following a sequence of steps. In reality, procrastination, fear and lack of motivation often results in a decision not being made, paradoxically, a decision itself.
16. Thinking about and analysing data relating to a decision is mistaken for actually making a decision.

Snap-decision rationality

The study has set out to analyse and evaluate Gladwell's (2005) assertion:

‘...what goes on in that first two seconds is perfectly rational. It's thinking - it's just thinking that moves a little faster and operates a little more mysteriously than the kind of deliberate, conscious decision-making that we usually associate with "thinking”.

The study has found that the snap-decision making phenomenon can be understood better from multiple perspectives, including the idea that ‘rationality’ as a term, needs to be re-defined within the snap-decision making context (DeMartino et al., 2006). The perspectives are unified within a consistent theory within as the core of the research thesis. It is a theory that has snap-decision making within its own ‘bounded rationality’.

Two core snap-decision phenomena

The researcher has taken two core phenomena from Gladwell, (2005); Gigerenzer et al. (1996); Klein, (1993), as starting points for discussions with entrepreneurial subjects viz Rapid-Cognition and Thin-Slicing.

‘A snap-decision is defined as a decision made in less than two seconds of time, or in the ‘blink’ of an eye. It is commonly assumed such decisions lack ‘rationality’ or due cognitive gravitas. This study challenges this core scepticism in favour of the potential of snap-decision supporting enhanced productivity. Findings suggest that snap-decision making is a core entrepreneurial strategy and tool.

Methodology - A collaborative case-driven methodology

The research paradigm

Collis and Hussey (2009) maintain paradigms and philosophy are interchangeable terms within the context of business research methodologies:

“A research paradigm is a framework that guides how research should be conducted, based on people’s philosophies and their assumptions about the world and the nature of knowledge”.

The knowledge gained by the researcher is characterised by high researcher input, active facilitation to elicit subject experience, feelings and perceptions in order to make sense of what is happening.

The case study method

This study is underpinned by a longitudinal principal case study that spans the duration of the project. This case study has allowed the researcher to create, refine and cross-reference the factors, drivers and influences that comprise the conceptual framework representing current snap-decision making theory. This framework maps and defines the key concepts and their relationship to other factors influencing effective snap-decision making.

There are strong arguments defending single or longitudinal case study strategy for researchers seeking to gain rich description, insights, along with a deep understanding of the context of the research and the process under investigation (Bell, 1999; Saunders *et al.*, 2000; Amarantuge, 2002; Velde, 2004). The case study method is defined and *specified as the person*: with qualifying criteria that must be evidenced as an *entrepreneurial mind-set* characterised by entrepreneurial behaviour demonstrated through spontaneous, natural awareness with purpose that exploits opportunities as they arise (S.N.A.P.).

Problem Based Learning (PBL) techniques

PBL techniques include brain-storming techniques; mind-mapping; cognitive mapping; perceptual mapping; and reflective techniques have all been used to probe and actively facilitate the generation of data. These techniques have elicited ideas, perceptions, insights, knowledge and expertise, while triggering and stimulating memories, impressions and recall of snap-decision making events. PBL is very much a collaborative technique built on trust, confidentiality and co-operation of effort.

Knowledge Elicitation

On the assumption the subject is operating an internalised ‘Expert System’ of entrepreneurial snap-decision making, based on experience. A battery of Knowledge Elicitation techniques including mind mapping, interviews with unstructured reflections, thinking-aloud recalls, story-boarding and scenario-walk-through within the snap-decision situation and event including the following descriptions:

- i. The domain (entrepreneurial activities).
- ii. The context (opportunistic situations requiring a decision).
- iii. The situational factors.
- iv. Snap-decision making as an entrepreneurial strategy to increase productivity.
- v. Time and resource pressures.
- vi. Outcomes as a learning tool.

Sample Frame

The main recruitment of entrepreneurial subjects were through purposeful, snow-balling whereby targets were approached after being pre-qualified through known activities, or referred and recommended. The sample is random on the basis of being serendipitous, chance, and non-planned approaches. Recruitment also depended upon subject’s interest in the project topic, and the subject being committed and willing.

Table 1: Sample Frame Qualifying Criteria

Sample Domain: Entrepreneur	Relevance	Primary Qualifying Criteria	Secondary Qualifying Criteria	Secondary Qualifying Criteria	Secondary Qualifying Criteria
Age	None				
Race	None				
Sex	None				
Location in UK	None	English speaking.	UK based for access/face-to-face meetings.		
Industry	None				
Product	None				
Service	None				
Type of entrepreneur	None				
Decision-Maker		Essential	With responsibility.	‘Is lonely’: i.e. without supporting resources -	

				(quote from Thorpe, R, 03/10/11 face-to-face meeting, Easterby-Smith et al. (2008))	
Snap-decision-maker.		Essential.	Evidenced and expressed interest in the strategy.		
Communicative.		Essential.	Strong written and verbal skills.		
Collaborative co-operation agreed.		Essential.	Strong commitment, expressed interest and motivation.		
Accessible.		Essential.	Technically adept.	Available for email, mobile phone, web-ex Video-conferencing.	
Referenced and promoted as an entrepreneurial person and lifestyle.		Essential.	Business cards, self-referencing.	HMR&C and official documentation.	Expressed belief and lifestyle - has control of time, tasks and outcomes.
Opportunistic (Vaghely and Julien, 2008).					
Risk takers in uncertain conditions (Tversky and Kahneman, 1977).					

Entrepreneurial perspectives of the ‘blink’ phenomenon

Gladwell (2005) identified the following dictums:

1. Provide a start-point ad framework for discussion during pilot work and pre-qualifying entrepreneur study subjects.
2. Provide reassurance to study subjects that the ‘blink’ phenomenon is a global ad valid approach to decision-making.
3. Stimulate approaches and perspectives on what others experience when making snap-decisions.

4. Shape the lines of research enquiry in terms of the key concept development: ‘thin-slicing and rapid-cognition.
5. Formulate questions and define issues.
6. Extend and investigate the nature of the two core concepts: thin-slicing and rapid cognition.
7. Use as a referent for study subjects, and receive feedback on its effect upon their decision-making thinking and behaviour.

This translated into the following trigger questions:

1. What is the nature of thin-slicing?
2. What happens when we engage in rapid cognition?
3. How can we improve our powers of rapid cognition?
4. When facilitates effective snap-decisions?
5. What inhibits effective snap-decisions?
6. What relationship (if any) can be identified between entrepreneurial mind-sets and snap-decision making?
7. How are snap-decisions different to decisions taken over longer time-frames?

The study has sought to interpret meaning and understanding of the ‘blink’, as it happens, live, or in the recent past, in every-day entrepreneurial activities. ‘Effective’ is defined as being timely, efficient (i.e. least effort and time taken) as *fit-for-purpose*, within the context of the decision-making situation.

Crossing the line

Provisional findings indicate that the study subjects believe that when snap-decisions are made, a fundamental change occurs. Once made, a snap-decision creates an irreversible mental, emotional and cognitive change in the maker. Just as ‘*we cannot step into the same river twice*’, the snap-decision maker cannot return to a pre-snap-decision position, because the decision flow has moved on; the mentality has changed; any subsequent decision is made from a different vantage point. The ‘*snap*’ moment creates an internal change, a conscious and structural change in thinking patterns and neural pathways. Snap-decision makers are transported beyond the line of ‘no-return’ However, as with most decisions, it does not mean that decisions cannot be changed, modified, or even reversed.

Findings to date – The S.N.A.P. Decision Theory

The longitudinal case study and researcher have conducted weekly meetings face-to-face, on the phone and via digital media over a four year period. The result has been the creation of working hypotheses underpinned with the framework below. These formative concepts have been verified by supporting case studies and in-depth interviews. This framework represents work-in-progress that will be concluded in 2012 in the form of the Entrepreneurial Snap-Decision Making Theory which this study posits.

THE CONCPETUAL SNAP-DECISION MAKING FRAMEWORK

<p>Themes</p> <ul style="list-style-type: none"> • Flow • Now • Flip • Tipping Point • Cut-to-the Chase • Every Second Counts 	<p align="center">The Entrepreneurial Approach: S.N.A.P.</p> <p align="center"><u>Spontaneous Natural Awareness with Purpose</u></p>	<p>The Point of Decision-Making</p> <p>'Knowing': <i>"It feels right"</i> <i>"I see it"</i></p>
<p>Factors</p> <ul style="list-style-type: none"> • Time • Experience • Expertise • Insight • Intuition • Emotion • Rationality: pre-during-post decision 	<p align="center">Snap-Decision Making Conceptual Framework 'S.N.A.P.'</p>	<p>Implies a change:</p> <ol style="list-style-type: none"> 1. Physiological (neural/chemical) 2. Mentality (thinking patterns) 3. Belief/Attitude/Perception/View 4. Situation-Opportunity Position: Improved/Neutral/Regressed
<p>Decision Making Systems</p> <p>Levels:</p> <ol style="list-style-type: none"> 1. Conscious 2. Unconscious <p>Cognitive</p> <ul style="list-style-type: none"> • Memories • Neural networks • Associations • Sensual patterns of information <p>Emotional</p> <ul style="list-style-type: none"> • Valence • Emotional Intelligence 		<p>Concepts</p> <ol style="list-style-type: none"> 1. Rapid Cognition 2. Thin-Slicing 3. Fast and Frugal Heuristics: Rules of Thumb and Principles 4. The Adaptive Toolbox 5. The Adaptive Unconscious <p>Drivers</p> <ul style="list-style-type: none"> • Confidence • Belief • Understanding • Optimisation of time and effort
	<p>Context</p> <ol style="list-style-type: none"> 1. Bounded Rationality (Simon, 1991; Gigerenzer, 2002) 2. Situational Judgement Opportunistic awareness. 3. Decision Intelligence The right things in the right place at the right time. 	<p>Fusion of Time</p> <ul style="list-style-type: none"> • Connectionist • Past-present -future in a single moment. • Decisions shape the future, are based on the past but entered

Conclusion

“...our snap judgements and first impressions can offer a much better means [than spending hours deliberating] of making sense of the world”.

(Gladwell, 2005, p. 4).

The study aims to define and translate natural, dynamic phenomenon within the entrepreneurial snap-decision process. Entrepreneurial behaviours have been captured in terms of awareness, attention, perceptions, responses and reflections during the snap-decision-making process and post decision-making process. It has sought to identify, decode and translate, categorise, label and explain key concepts and elements within the event.

The ultimate study aim is to posit a theory of snap-decision making from entrepreneurial perspectives. It has also indicated viable further research areas such as pattern-recognition and the role of experience within intuitive influences during the snap-decision making experience.

“Education is when you read the fine print. Experience is what you get when you don’t”.

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3dSA: A Tool for Integrating Stakeholder Analysis and Risk Management

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Abstract

A construction project results in a physical facility which, in its construction and use, has an impact on the environment and wider society, which naturally leads to the creation of stakeholder groups with different interests. There are risks involved in dealing with these stakeholders and often resolving competing interests. Therefore, there is a need to better integrate stakeholder analysis and risk management, to provide an effective way of managing the risks which might arise from the potential actions of key stakeholders. To meet this need the authors have modified the Power-Interest-Matrix in a way that it is integrated with risk management to provide a tool that is easy to implement in construction projects. The tool is illustrated through a practical implementation to a real case construction project in Germany, in which a comparison is shown of how stakeholder analysis is traditionally done and how, with the modified tool, it is improved and integrated with risk management.

Keywords

Construction, Project Management, Stakeholder Analysis, Power-Interest-Matrix, Risk Management.

1. Content and motivation

Even if the constructed facility is immobile the environment in which construction projects are realised is highly dynamic. The impact of construction projects on society is immense during the whole project life cycle. This enormous impact is perceived by its environment, which creates parties who can affect or can be affected by the project. These parties are called stakeholders. Dealing with stakeholders is part of daily business for each involved party in construction; even it is not practiced with a formal approach or method. The client or the client's representative has to focus on the identification, analysis and engagement with key stakeholders because they can have an impact on completion or failure of the project. Therefore stakeholders can be helpful in achieving the project aims, but they can also cause threats. The focus of stakeholder theory in risk management is on considering the views and perceptions of stakeholders and engaging with them actively when doing risk management (Ellen, & Duijn, 2011).

Given that a risk can be defined as a variation from an aim (Project Management Institute, 2008; International Organisation for Standardisation, 2009) and considering that stakeholders can create such a variation, there is also another relationship between stakeholder and risk, namely risks which can arise out of key stakeholders. The current project management [PM] literature shows different ways of integrating stakeholder analysis with risk management. But as Olander & Landin (2005) highlighted further research is required, which creates a relationship between stakeholder analysis (especially stakeholder mapping) and risk management. Therefore this paper presents a tool which addresses issues at the interface

between stakeholder analysis (especially stakeholder mapping) and risk management. The tool is demonstrated through a practical application to a real case construction project, in which it is shown how stakeholder analysis is done in a general way (existing) and how it has been improved and made applicable for risk management through the new tool.

2. Background

2.1 The need for stakeholder analysis in construction projects

The roots of stakeholder analysis are in political and policy sciences (Brugha & Varvasovszky, 2000). In the management literature the term ‘stakeholder’ first appeared at the Stanford Research Institute in 1963 (Freeman, 1984). The growing realisation that stakeholders can affect an organisation’s success has led to the development of approaches to analyse stakeholders (Brugha & Varvasovszky, 2000; Reed et al. 2009). It has developed systematic tools, with clearly defined steps for showing the organisation or project stakeholders in a transparent way (Varvasovszky & Brugha, 2000).

The most basic description of a construction project is the planning and building of some physical facility (Pinto & Covin, 1989). The product, i.e. the constructed facility is immobile, which results in the fact that the facility has to be produced at the point of consumption (construction site) (Gann, 1996). Each project is unique in its circumstances and requires therefore a unique combination of labours and materials, performed and coordinated on the construction site (Eccles, 1981). There are a large number of specialists involved when realising a project, such as [...] “carpenters, bricklayers, plumbers, pipefitters, electricians, painters, roofers, drywallers, sheet metal workers, glaziers, and laborers” (Eccles, 1981, p. 337). There is a high range of materials and component parts (Gann, 1996). The management, planning and coordination of the labours as well as the materials is a complex task (Gidado, 1996), which makes construction projects more complex than projects from other industries (Winch, 1989). Construction projects have to be constructed under a short time framework, but have a long term impact into society (Harris, 1998). Therefore many different and sometimes opposing interests of several groups from the society have to be considered during the project life span, which also includes the operational phase of the facility. To conclude, there “[...] are stakeholders in construction undertakings, just as there are stakeholders in other endeavours” (Chinyio & Olomolaiye, 2010, p. 2).

The Project Management Institute (2008, p. 23) defines stakeholders as follows: “Stakeholders are persons or organizations (e.g., customers, sponsors, the performing organization, or the public), who are actively involved in the project or whose interests may be positively or negatively affected by the performance or completion of the project”. Stakeholder analysis “[...] is a framework that enables users to map and then manage corporate relationships (present and potential) with groups who affect and are affected by the corporation’s policies and actions” (Weiss, 1998, p. 30). Therefore stakeholder analysis is a process which shows the needs of different groups related to the project. Slack et al. (2006) suggest doing the stakeholder analysis through the following steps:

1. Identify stakeholders
2. Prioritise stakeholders
3. Understand key stakeholders

It is important for the PM team to identify those stakeholders who can affect the project at early project stages (Olander & Landin, 2005). At early project phases it might not include all stakeholders or provide enough information about the characteristics, but it should provide initial data for other PM tasks, like risk management (Celar et al. 2010). Projects can have negative as well as positive stakeholders, i.e. some stakeholders benefit from the successful completion of the project, while some perceive the project failure as more beneficial (Project Management Institute, 2008). Olander & Landin (2005) concluded that construction projects have a dynamic environment during all project stages, which results in the fact that the key stakeholders are changing in each project phase. Therefore stakeholder management has to be done in each phase of the project life cycle.

The number of stakeholders in a construction project can be many, therefore it is important to prioritise the key stakeholders in a construction project. This will ensure the efficient use of effort to communicate and manage the expectations of stakeholders by the PM company (Slack et al. 2006). There are several classification models available to prioritise stakeholders. The Project Management Institute (2008, p. 249) has listed a few, which are as follows:

- Power/interest grid
- Power/influence grid
- Influence/impact grid
- Power/urgency grid

The focus of this paper will be on the power/interest grid, which is in practice also called the Power-Interest-Matrix (see figure 1), because it is the one most commonly used in the construction industry (Chinyio & Olomolaiye, 2010).

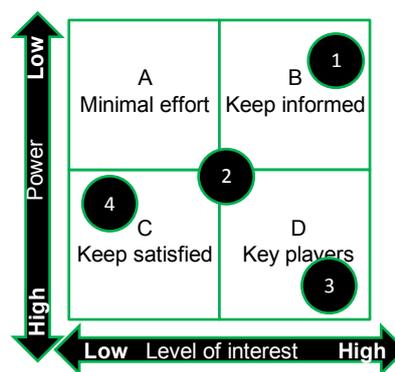


Fig. 1. Example Power-Interest-Matrix

The Power-Interest-Matrix is a two dimensional grid, where the power and the level of interest of the stakeholder on the project is assessed qualitatively and plotted. Johnson et al. (2005, p. 181) argue that the Power-Interest-Matrix does underline two important issues:

- How interested each stakeholder group is to impress its expectations on the organisation's purposes and choice of specific strategies.
- Whether the stakeholders have the power to do so.

Olander & Landin (2005) concluded that through grouping the stakeholders on the Power-Interest-Matrix, the PM gets a higher transparency about how the communication and relationships between stakeholders can affect the project objectives. The relationship between the stakeholder's positions on the grid and the selection of an appropriate stakeholder management strategy is explained by Slack et al. (2006, p. 494) through the following example:

“Stakeholders’ positions on the grid give an indication of how they might be managed. High-power, interested groups must be fully engaged, with the greatest efforts made to satisfy them”.

Understanding the expectations of stakeholders is an important part of the project manager's responsibilities (Project Management Institute, 2008). Inadequate management of stakeholders leads to conflicts and problems, which can result in risk or crises management over the project life cycle (Olander & Landin, 2005). Without paying enough attention to the needs, expectations and interests of key stakeholders, a project probably will not be considered as successful, even if the PM was able to stay in the planned cost, time and scope framework (Bourne & Walker, 2005).

2.2 The need for stakeholder analysis in risk management

In management sciences or in management practice a risk is defined as the “effect of uncertainty on objectives” (International Organisation for Standardisation, 2009, p. 1). That definition considers that “there is the potential for events and consequences that constitute opportunities for benefit (upside) or threats to success (downside)” (Institute of Risk Management et al. 2002, p. 2).

The aims of construction project risk management are “[...] to increase the probability and impact of positive events, and decrease the probability and impact of negative events in the project” (Project Management Institute, 2008, p. 273). The risk management process consists, according to the ISO Standard 31000, of the following steps (International Organisation for Standardisation, 2009, p. 14):

1. Establishing the context
2. Risk assessment
 - 2.1. Risk identification
 - 2.2. Risk analysis
 - 2.3. Risk evaluation
3. Risk treatment

Stakeholders have to be considered in the risk management process in two ways.

The views, perceptions and perspectives of stakeholders have to be considered when establishing the context and defining the risk criteria (Miller & Bromiley, 1990; Williams et al. 1999; Roy, 2004; Schwarzkopf, 2006; Sparrevik et al. 2011). This linkage between stakeholder and risk management is related to the decision making and engagement of stakeholders (Williams et al. 1999). This is more a communication and relationship management issue, because the multiple stakeholder perspectives affect the risk perception and thus the decision making (Schwarzkopf, 2006).

Accepting that the term “stakeholder” means, any party who affects or can be affected by the actions of another party, shows clearly that there is a link between stakeholder and risk

(Thompson, 2010), because stakeholders can cause an uncertain event on the project objectives. Therefore the second way of considering stakeholders in risk management is related to the fact, that there are risks which can arise out of stakeholder's engagement with the project. Hence stakeholders have to be considered in risk assessment as well as risk treatment. This relational perspective of stakeholder analysis and risk management has been considered by Leung & Olomolaiye (2010), who have developed a risk register, in which the risk event is assigned to various stakeholders. But in accordance with Olander & Landin (2005) further attention is required, on developing tools and techniques that focus on the relationship between stakeholder analysis (especially stakeholder mapping) and risk management.

3. Problem definition and research aim

Thompson (2010) as well as Leung & Olomolaiye (2010) found out that there is a link between stakeholders and risk, because there are risks which could arise out of stakeholders. The stakeholder analysis is a tool which shows the needs of different groups related to the project. Conducting stakeholder analysis results only in considering the needs of different groups related to the project. But how far would stakeholders go to achieve their aims or prevail their interests? This is a huge risk factor (positive or negative) which is not considered in the current way of how stakeholder analysis is performed. The traditional way of performing stakeholder analysis characterises stakeholders by its power and by the level of own interest, there are also other ways to express the characteristic of stakeholders (Project Management Institute, 2008), but the suggested methods are two dimensional.

The authors propose that a stakeholder needs to be analysed in three dimensions to warrant higher transparency and to create the required link to risk management. This third dimension could be the attitude towards the project from the stakeholder, because this might be the best dimension to show if the stakeholder can cause a potential benefit/opportunity or failure/threat. The attitude can be positive, neutral or negative on the project. This third dimension will give an overview to the PM if there are threats or opportunities, i.e. risks which can arise out of those stakeholders. This is important for the PM in order to develop an appropriate engagement strategy and in order to set right priorities.

To achieve the above mentioned aim following objectives have been derived:

1. To obtain a deep understanding of the salient concepts between stakeholder analysis and risk management.
2. To develop a management model that considers the required three dimensionality of stakeholder analysis.
3. To apply the developed model on a real case construction project and to draw conclusions as well as identify areas for further research investigation.

The tool will look on stakeholders in a three dimensional way, considering the three dimensionality the tool is called "three dimensional stakeholder analysis", in short 3dSA.

4. Method

This paper seeks to develop a tool to help address problems at the interface between stakeholder analysis and risk management. This development will be done in two stages. Firstly, by reviewing the trends in current literature and by the observation of how stakeholder analysis is done in the past through an examination of a real case construction project. Secondly, the tool will be implemented on the same real case construction project. Then conclusions will be drawn by comparing the actual and new way of doing stakeholder analysis.

Data on the traditional approach will be collected using archival records (initial project report and project status reports), which will show the authors how this particular project team has managed or are still managing stakeholders. It will provide the information on who are the salient stakeholders and how they are being managed. This will fill the gaps between theory (literature) and practice and the researcher will be able to get more detailed knowledge.

4.1 The case study – Dornier Museum

The case study is the Dornier Museum, which stands for the construction of the new museum of aviation and aeronautics in Friedrichshafen, Germany. The project has been initiated by Silvius Dornier who is the son of Claude Dornier (1884 – 1969). The museum gives to its visitor's insights about the developments in aerospace and aviation, which have been mainly influenced through the pioneering activities of Claude Dornier. The Dornier Museum is besides the Zeppelin Museum the second Museum about aviation in Friedrichshafen. The project is located close to the airport in Friedrichshafen. Annually 150,000 visitors are expected by the museum operators.

The building has the following technical key information:

- Gross floor area: 7.375 m²
- Gross volume: 50,900 m³
- Length / Width / Height: 112 m / 54 m / 12 m
- Foundation: 72 piles (length 18 m)
- Geothermal: 76 geothermal probes, each 80 m depth

The project has an investment volume of approximately 30 Mio €. The design phase took 15 month. The execution has been done in 18 month. More than 40 engineering and consultancy offices and more than 300 craftsmen were required for the implementation of the design and execution.

5. Findings and discussion

Data of how stakeholder analysis has been practiced traditionally is accessed with the initial project report and existing status reports of the project.

Stakeholder identification has been initiated at the early stages of the project. The PM has listed key stakeholders in a table, where they have been categorised in internal and external. Stakeholders have been identified through reports from previous similar types of projects and through the experience of the PM.

Those identified stakeholders are analysed qualitatively by the PM in regard to their power and the own level of interest. The analysis is based on subjective opinions by the PM, where points have been given from 1 (low) to 5 (high) for both analysis criteria's. The analysis of the key stakeholders was done tabular. An abstract of the stakeholder analyses is shown in Table 1.

After the stakeholders have been analysed, the PM created a table where priorities have been set and the suggested treatment strategies were listed. Those findings have been presented to the client in the framework of the initial project report, so that the client was able to add eventually key stakeholders and make decisions if the suggested effort shall be investigated for the stakeholder or not.

Table 1: Power-Interest-Table of Case Study

<i>Stakeholder</i>	<i>Power</i>	<i>Level of interest</i>
<i>Client</i>	5	5
<i>Public authorities</i>	5	4
<i>Project Management</i>	3	5
<i>Aerospace Foundation (sponsor)</i>	2	3
<i>Operator</i>	1	3
<i>Architect</i>	2	4
<i>MEP Planners</i>	1	1
<i>Contractor</i>	2	1
<i>City</i>	4	2
<i>1 = none ... 5 = very high</i>		

The Power-Interest-Table of the case study (shown above) reflects the current way of how stakeholders have been analysed for the Dornier Museum in Friedrichshafen, Germany. The level of power from the stakeholder has been related to the level of own interest by the PM. Those stakeholders can be pasted in a Power-Interest-Matrix (see Fig.1), where they can be categorised into four categories (minimal effort, keep informed, keep satisfied or key players) of treatment strategies. If a stakeholder is in between several areas, the PM has to decide how this stakeholder has to be classified. However, understanding the expectations of key stakeholders is an important issue, but it is also important to consider risks which could arise out of those stakeholders, because the PM needs to consider what happens if the engagement strategy fails. Therefore the authors argue that the two dimensional interpretation of stakeholders might be not enough to increase opportunities and to decrease threats which could arise out of key stakeholders. More transparency can be added to the Power-Interest-Matrix through using the attitude of the stakeholder as a third dimension. This will help in identifying possible threats or opportunities, i.e. risk identification. Relating the derived theory to practice, results in considering the key stakeholders of the case study and adding the new third dimension (the attitude), which is shown in Table 2.

Table 2: 3dSA

<i>Stakeholder</i>	<i>Power*</i>	<i>Level of interest*</i>	<i>Attitude</i>
<i>Client</i>	5	5	1
<i>Public authorities</i>	5	4	3
<i>Project Management</i>	3	5	2
<i>Aerospace Foundation (sponsor)</i>	2	3	2
<i>Operator</i>	1	3	2
<i>Architect</i>	2	4	3
<i>MEP Planners</i>	1	1	3
<i>Contractor</i>	2	1	3
<i>City</i>	4	2	2
* 1 = none ... 5 = very high			
** 1= very positive; 2=positive; 3=neutral; 4=negative; 5= very negative			

A risk can be a potential benefit or a potential threat. This case study will give a different perspective on risk identification, namely the positive one. This is related to confidentiality issues, the authors are not allowed to show any stakeholders who might have an interest in the project failure and would have a negative attitude to the project. However, considering the fact that the construction project is a museum outside the city centre, results in a building which contributes to the social environment in a positive way. Therefore this project holds more opportunities and benefits by its stakeholders, than disadvantages and potential threats. Furthermore showing the positive perspective of risk is also a great contributor to risk management research.

The qualitative numerical values of the row attitude have been proposed by the authors, and were then confirmed by the project management company.

The three dimensionality can be visualised with the below shown 3dSA diagram.

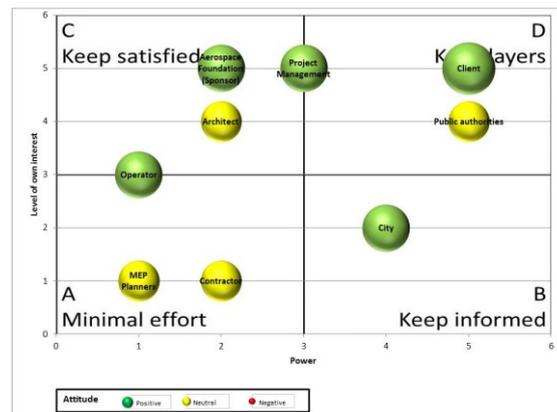


Fig. 2. 3dSA - Diagram

In comparison with figure 1, the main difference of the 3dSA diagram is the three dimensional view on stakeholders. The third dimension here is the size of the ball, which shows if the stakeholder has a positive or negative attitude on the project. Therefore the attitude shows if eventual opportunities or threats might be caused by this particular stakeholder. In order to create higher transparency in the framework of this paper, the authors have added also the colour (green positive, yellow neutral, red negative). But the basic principle behind 3dSA diagram is that the bigger the ball the higher the opportunity.

However, after those stakeholders have been mapped the PM gets a higher transparency about which stakeholders need more engagement and which do not.

As an example, the sponsor of the project (Aerospace Foundation) has a positive attitude towards the project. They expect more recognition and interest of their organisation through the museum. They want to have areas where they can do promotion and advertisement about the aim and objectives of their institution in order to get more members and donors. In the Power-Interest-Matrix this stakeholder is classified as 'keep satisfied'. But this stakeholder, who is a major sponsor of the project, can cause benefits during the operational phase. For instance it might be that the museum needs new funds for refurbishments, expansions or new exhibition materials. Engaging with this stakeholder during the project execution actively might result in a closer relationship towards the project and might be helpful. Therefore this stakeholder can be viewed as a key player during the operational phase, and the PM should try to create a strong relational foundation during the project execution, in order to increase the potential benefits during operation. A possible engagement strategy could be to make a quarterly project journal where the current and expected status of the project is illustrated (might be used for other stakeholders as well), to enable site visits and provide actual pictures, i.e. to engage actively with relevant project material and give the sponsor the feeling that he is an important part of the project.

This identified opportunity (positive risk) can be used for qualitative risk analysis and/or quantitative risk analysis in order to create higher transparency about the possible impact and probability (in numerical and/or statistical values). Out of that the treatment strategy can be further developed.

6. Conclusion

This paper proposed a new way on viewing on stakeholders, with the aim to create a link between risk management and stakeholder analysis. The tool looks on stakeholders in three dimensions and not as currently practiced in two, as a result it is called "three dimensional stakeholder analysis", in short 3dSA. The project attitude by the stakeholder has been suggested by the authors as the third dimension, because this can be positive, neutral or negative towards the project aims and objectives, and can therefore reflect risks which can arise out of stakeholders. However, the decision about which dimensions should be chosen depends on the project circumstances and can be kept therefore flexible. The tool can be used for risk identification and creates therefore a link between stakeholder analysis and risk management.

The PM of the case study project confirmed that the tool creates a transparent understanding of stakeholders in the project and that it reflects the risks by them. This has been perceived highly supportive in strategy development of how to engage with which stakeholder.

The limits of that tool are related to the usage in practice. Stakeholders analysis has been always practiced, but not in a detailed and formalised way. Therefore might be this tool perceived as nothing new, but it is a formalisation of that what is already practiced.

Further research is required in order to define universal analysis dimensions for same type of projects. The validity of that tool with testing it on several case studies needs to be confirmed as well. Stakeholder analysis is practiced in a qualitative way, which results in that the data is related to subjective opinions. Being able to quantify stakeholders would result in more objectivity.

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The Purchasing Motives of SMEs: A Pilot Study in Turkey

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Abstract

Why – Small and Medium Enterprises (SMEs) are the basis of commercial activity in human history, however they have only been recognized since the second half of the 20th century. Even in the largest economy of the world, the United States, SME governance (usasbe.org) was established in the 1950s, nearly 150 years after the NYSE's (New York Stock Exchange). Although knowing customer potential is a top priority in many sectors, there is limited knowledge of SME buying behaviors. In other words, its buying characteristics is also subject for this late recognition, which may cause misfit models in marketing -to SMEs- field or inefficient procurement of SMEs.

How – The core of the survey is the product section with 2 Wilson and 5 Kotler questions asked for 12 different products, from tangibles to intangibles. The set of 7 questions will be asked for both economic crisis and non-economic crisis environments based on perceptions of the audience. It's expected that 6-step likert scale consists 'Buying Attitude' index from red to green color code.

What – Hypothesis is tested and found as correct: SMEs do also buy within leisure-routine axes and when they do, they spend more and faster like individual consumers. Besides, even in economic crisis environment, there are products that SMEs compromise less and they are not necessarily perceived as highly tangible -professional- needs.

Who – The primary stakeholder is behaviorists. They may further investigate why SMEs make these purchasing decisions. In addition, marketers can also benefit from the reality that SMEs do buy like individuals and practice the tested framework. Lastly, SMEs can use this as an opportunity to be conscious of their purchasing habits and take necessary actions.

Keywords

SME, buying behavior, marketing to SME, need driver, purchasing motive

1. Introduction

Strategy is one of the most important indicators which set the short and long term success pattern of companies and sustainable development (Oner, 2004). Within the marketing part of it, there are two general stages; developing and implementing, where everything in the developing stage starts with understanding customer behavior. The most basic premise of marketing management is market segmentation, the partitioning of the market into homogeneous groups on the basis of their needs, buying patterns and consumption behavior

(Kotler, 1988). If a company does not understand its customers relative to its market opportunities, then the odds of its marketing strategy's success, no matter how otherwise clever, unique, or well executed, are greatly diminished (Silk, 2006).

The majority of all relevant sources and many sectors, including technology analyze, 'consumer -buying- behavior' in two domains; business customers and individual customers. For 'business customers', it's easy to see organizational buying behavior as the main topic, which is also proof of concentrated areas selected as corporate customers rather than SMEs (Webster et. al, 1972; Sheth, 1973). Wilson (2000) summarizes the misleading distinction behind previous models, though the application side of the issue remains premature.

2. Literature Review

Possible factors for behaviorism are given by Sandhusen (2000). They include environmental stimuli, buyer characteristics, decision procedure of the need, and buyer response

2.1. Environmental Stimuli

Although it is possible to find some supporters for no relationship between economy and politics in the world (Zizek, 2008), this is not the case in Turkey (Onur, 2004).

The culture of SMEs in Turkey can be summarised as diverse, rather than small versions of big companies, they have distinctive backgrounds (Ellegaard, 2009). Besides, culture might be considered different in terms of inter-country comparison. There are as many different SME cultures as there are different world cultures. To give an example for both, although the ratio of micro companies is around 10% within the sample, 3% of owners are women and 13% of owners are elementary school as the highest education level completed (Coskun et al., 2002). The first finding may be typical compared to developed economies, where the second might be very atypical.

Demographic sub-parameters such as age, gender, education, years in the business, life style (e.g. publication read, technology usage, relations with competition) may also feed the context.

2.2. SMEs' Characteristics

- Ownership and general management structure may be summarized as owner-managers who dominate the management and all crucial decisions, in other words flexible and informal, rather than a hierarchical organization. (Figure 1). Lack of human resources, as well as specialists, is a kind of prerequisite to being an SME, especially for smaller ones. Lack of trust in general (Sharif et al., 2005), loyalty to selected vendors (Madill et al., 2002), as well as self-confident behavior are the other characteristics.
- Customers may be summarized as local customers with very little international or out-of-region expansion. Close relationship -network- based behavior is likely the key (Gilmore et al., 2006). Loyalty plays an important role for both parties.
- Systems and procedures may be summarized as being simple yet adequate. They mostly don't have the luxury to deal with formal processes, mostly because of the lack of time and also because they don't find it necessary. It's important to note that not having a sophisticated system working behind them does not mean they do not have competence. However, literature notes that this is a factor which brings the 'limitation'. Although this is important for behaviorists, this may not be a factor for marketers at all, this may only be an opportunity to catch how to treat them, what to do.

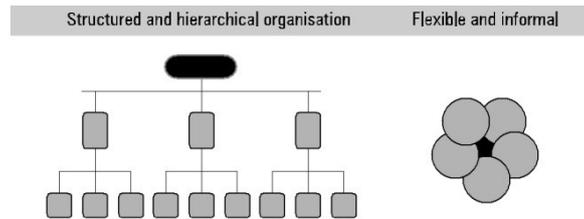


Figure 1: SCOs' (small company owners) management representation (Hankinson, 2000)

2.3. Need Assessment

2.3.1. Characteristics of SMEs' Needs

Need Driver

Purchasing is an action to fulfill some need. According to Mahatoo (1989), to fulfill the need, need drivers are seen as motives, but not necessarily all motivational concepts. The motivational boundary is a factor to build the motive; therefore the practical and crucial information for the behaviorist is to identify the motives, in other words 'need drivers' of the customer.

The starting point should be to learn how customers position the products on driver basis. Is the source behind positioning tangible, intangible or just a personal interest? Since the way they conduct the buying action should rely mostly on this, not the need itself. Without knowing the meaning that customer load into the purchase, there is a great lack of knowledge.

According to many researchers, like Nicosia (1976), Smith (1985), Rushton (1989), Shaw (1989) and Wilson (2000), intangibility does not only belong to individuals and cannot explain consumer's buying behavior alone. Likewise, tangibility does not belong to organizations and cannot be used to explain organizational buying behavior alone. They all mention different tangibility levels behind investments.

Therefore, the outcome of SMEs' need drivers is as follows, while the possible correlation between consumer approaches is remarkable.

- High Tangibility; Must have
- Moderate Tangibility;
- Low (or no) Tangibility, Intangibility; Nice to have

Purchase Significance

Purchase novelty is a key factor to define the conduction of need characteristics (Robinson, 1967). The 'buy class' theory basically has 3 three levels of differentiation.

- Is this a new task?
- Is this a modified rebuy?
- Is this a straight rebuy?

The center of the need leverage is based on frequency, which also may show the continuity of the need. In other words, is it a one-time-purchase or is the perceived significance 'routine' rather than 'exceptional'? (Wilson, 2000)

In Turkey, the product renewal period is lowest for cellular phones with 2,5 years, about 3 years for computer and 6 years for television (Millward Brown Research, 2010). In other words, in order to define the ‘need characteristics’, not only ‘need driver’ but ‘purchase significance of this need’ also plays a very important role, therefore the distinction of different combinations is more understandable.

Purchase significance of the need;

- Exceptional; Rare
- Moderate
- Routine; Returning need

2.3.2. Characteristics of Their Investments

There is a long debate among academics and practitioners for the differences between goods and services in terms of purchasing (Rushton et al., 1989). Although investments may vary from human resources to the trivial, the concentration here would rely on marketable, in other words goods or services with this ‘product’ stance.

The variables of services (Rushton et al., 1989) are intangibility in general (cannot touch, taste, smell, see), heterogeneity (cannot be standardized in the way goods can), perishability (cannot be stored, if it’s not used when available then the service capacity is wasted), inseparability of production and consumption. These intangible elements make the procurement hard to evaluate, whereas this is barely a new field to focus on.

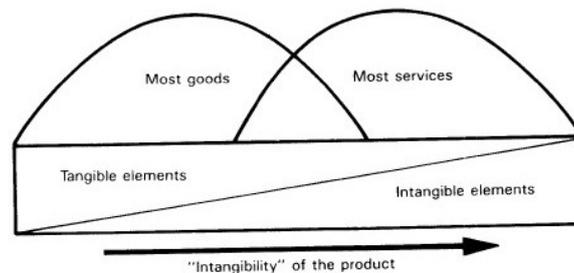


Figure 2: Product based tangibility representation (Rushton et al., 1989)

2.4. Model Assessment

2.4.1. Buying Behavior Models

Although the understanding of SME purchasing practices has improved in years, there are notable gaps (Ellegaard, 2009). To summarise it’s common agreement to state that there is real need for an improved understanding of purchasing behavior and competence of SMEs particularly in terms of its informal nature. Similarly, but specific to global purchasing topics, Quintens and Pauwels and Matthyssens(2006), stated the field is still in need of more profound and longitudinal case-base studies (after having surveyed 123 cases) that allow a more in-depth exploration of the phenomenon, since the current conceptual framework appears to be superficial and poorly explored, therefore the current added value of advanced theory-testing structural equation models can be questioned. With this point of view, after

123 case studies, it's reasonable to note that not offering a model would not be the correct path toward that aim. Other points and variables are;

- 'Strategic purchasing' seems an insignificant factor towards 'Understanding SME Buying Behavior', therefore trying to look for an answer for 'What is a need driver?' rather than 'What is a purchasing procedure?' might help to find out more useful information for both parties.
- Because of the complicated nature of supplier/procurement relationships, it is reasonable to scrutinize purchasing adoption. However, simple vendor/buyer transactions also occur, which is the field that the majority of commercial activity comes. In other words, the attention in SMEs as end-user through commodities for internal usage, rather than raw material to use in manufacturers or inventory to resell might be more important.
- Not only purchasing wise but the word 'adoption' is widely used, especially in ICT adoption of SMEs manner; Kendall (2001), Milling (2002), Galende (2003), Tambunan (2007), Yu et. al (2009). The majority considers companies and SMEs as end-user, but 'to be adopted' basis, not 'already -somehow- adopted' SMEs which is more crucial for practitioners. How do they respond in terms of preferred channel, timing, payment model, and brand level? This question is worth investigating further to open up SME's black box, rather than supplier evaluation and capability factors of Moller and Torrenen (2003), Pressey et. al (2009).
- It's noticeable that nearly all papers use ICT as a subject of 'specific ICT' investment, but there is no presence of 'popular ICT' and apparently no other investments like furniture, car, commercial light vehicle.

Knowing that there is likely no last word in such a less touched field, the topic stated above deserves more attention due to the vast potential in the world, especially for providing comparative analysis among sectors. Pressey (2009) stated his study has been a first in an SME context, whereas this study will raise the similar questioning, however within a different framework that aims rhetoric findings through the moment of procurement's attributes, like what/when/where SMEs buy, rather than heuristic precedings of procurement, like how SMEs buy. Unlike the latter, we assume that the former sums results rather than reasons, whereas the buying action wise results are likely the missed parts of the puzzle. Once this pilot study proceeds to the big run, we expect to develop the framework that consists of a maturity map for the stakeholders -behaviorists, marketers and SMEs- of this action.

2.4.2. Modeling Buying Behavior of SMEs

Shaw et al.'s quote can be considered as the bias needed for a model for buying behavior of SMEs:

Are we to think that an executive makes business buying decisions based on quantifiable product characteristics and yet makes personal buying decisions based on intangibles?

Similarly, Wilson (2000), based on some preceding researchers like Smith et al. (1985), promotes the idea of rationality-irrationality or tangibility-intangibility in needs that do not belong to only one side. Every party has its say on this, whether individual or organizational. Pickton (2001) states that a human being is a human being; the center of everything and

cannot change like a robot when acting in business situation or when switching button. Coviello et al. (2001), presumes that the organizational-consumer buying behavior dichotomy may not be relevant in describing and analyzing purchase decision making. After all, the reasoning behind whether to use rationality or intangibility of need drivers might be more important, since the current situation is likely seen many times as a group, but no application for organizations, especially for SMEs that are supposed to be more similar to individuals rather than the similarity between organizations and individuals relatively.

It's also crucial to note Fern's (1984) thesis underlying these views which represent 'extreme examples' rather than normative and generalizable models. In other words, if the level of rationality behind the buying decision is a factor that should be observed, the 'extreme example' situation would be dropped. A normative and generalizable model can be linked to Alsan and Oner's (2004) IFM (Integrated Foresight Model) model seeking an answer for foresight under an operational research umbrella. Why can't normative and generalizable models be used for buying behavior?

Wilson (2000) not only offers an integrated model for this, but also promotes the usage in a wider manner. Although his proposal has been designed for organizational buyer behavior, he asks why it can't also be applied to the context of consumer purchasing. He also answers that there is no obvious reason for a showstopper.

Even the reverse should be a subject, since Wilson's quote (2000) points out:

If a unified model of purchase classifications could be developed there seem no compelling reason to perpetuate an unnecessary distinction between organizational purchasing and consumer purchasing.'

Summing up the buying behavior literature review in the light of SME segment;

- Organizations do also buy within low tangibility need driver. (Wilson, 2000)
- Higher purchase significance affects the buyer attitude's enjoyment positive. (Wilson, 2000)
- Lower tangibility need drivers affect the buyer attitude's enjoyment positive. (Wilson, 2000)
- No correlation between tangibility level of products and need characteristics. (Rushton, 1989)

We formulate the following hypothesis: When SMEs have more leisure need drivers accompanied by routine procurement; their buying behavior is more enthusiastic. In other words, it is closer to the enjoyment level of the 'Buying Attitude' axis.

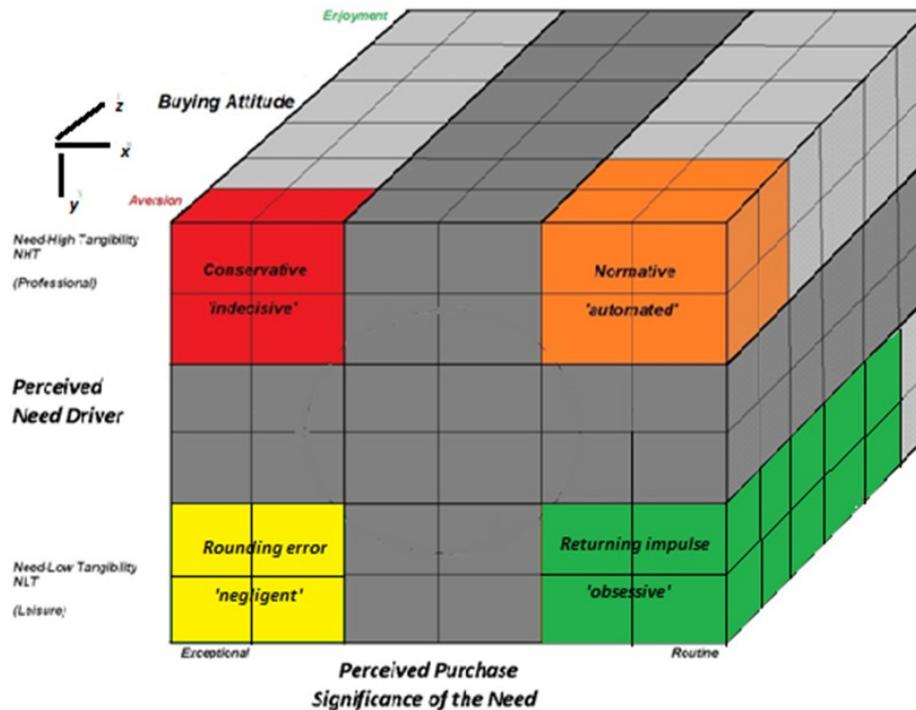


Figure 3: Wilson's cube (2000)

Figure 3 concludes the points stated in this section. The model helps to supply answers for the need assessment and buying attitude questions in the boxes which will be asked for each product¹. It will be up to the SME how to perceive the boxes whether high tangibility need-low tangibility product intersection or routine procurement-moderate tangibility product intersection. Any combination among axes is possible; SMEs will only need to choose best expressing answer. Basically, Kotler (2006) says

Once the consumer has decided to execute a purchase intention, he/she will make up to five purchase sub-decisions.

3. Research Methodology

A review of the literature shows that a significant amount of qualitative work has already been done (Ellegaard, 2009), and there is no lack of buying behavior models. Therefore, the centric focus of this research is the quantitative application of the chosen buying behavior model to probe SMEs.

The survey technique was selected and a questionnaire with 100 questions was prepared. The core of the survey was the product section. It consisted of 2 Wilson and 5 Kotler questions asked for 12 different products, from tangibles to intangibles. The set of 7 questions covered both economic crisis and non-economic crisis environments based on perceptions of the audience. It's expected that 6-step likert scale consists 'Buying Attitude' index from red to green color code.

¹ Tea, Property, Furniture, Vehicle, Communication Tech., IT, Special Tech., TV, Insurance, Financial Services, Consulting, Ads

Need assessment questions (Wilson, 2000)

1-) Is this a subject for routine procurement in the company? (Exceptional-Routine) [x-axis]

2-) Is this a must for the company? (Professional-Leisure) [y-axis]

‘Buying Attitude’ questions (Kotler, 1967) [z-axis]

3-) Marcom tone noticed? (Rational-Emotional) [Adapted]

4-) Brand preferred? (No name-Famous)

5-) Financial model? (Low-High Liquidity)

6-) Sales point? (High-Low Relationship)

7-) Response time (Not sure-ASAP)

3.1. Data Collection

The table represents the distribution of the sample size that we planned to use. As a pilot, we first conducted the Manufacturing/10-49 employee part (Table 1)

Table 1: The distribution of the sample

<i>SME Sampling (w/ # of companies)</i>		<i>Sector</i>		
		<i>Manufacturing</i>	<i>Construction</i>	<i>General Trade</i>
<i># employee brackets</i>	<i>Below 10</i>	30	30	30
	<i>10 to 49</i>	30	30	30
	<i>50 to 249</i>	30	30	30

An agency conducted the field survey and used its own database. Due to an unreliable posting system, low returning rates by nature and cultural effects, posting has been eliminated from being an option. The survey has been completed through telephone calls and meetings.

The return rate in the pilot was 100%, therefore return rate contingency has not been considered for further phases. Knowing budget limitations, this finding encouraged the journey.

3.2. Data Analysis

The mode of the responders can be summarized as high school educated purchasing managers, aged 30 – 39, in companies established between 1980 and 1989. Correlation analysis shows that there is weak to moderate negative correlation for Wilson’s 2 axes. Mean numbers do not give us the chance to understand the full picture. The response distribution on Figure 4 shows the groups better with blue circles and that they are aligned with Wilson’s cube. 70% of responses came through corners, where two-third came through only 4 boxes, number 8 (red), number 11 (orange), number 26 (yellow), number 29 (green), Wilson’s corners dominate the results here. In other words, organizations also buy within low tangibility need drivers. This supports the hypothesis.

Unlike Wilson, analysis shows a positive but weak correlation among Kotler. Seeking this through Kotler’s mean numbers will mislead us. For instance, analysis for IT products shows no significant correlation among Kotler, however supports a positive correlation between Wilson and Kotler. This has been noted as same product may produce different Kotler results for different Wilson boxes. In order to have a more meaningful understanding of Kotler’s answers, another correlation analysis has been conducted for the areas that most responders have been grouped (Boxes 8, 11, 26 and 29). Figure 5 shows that the correlation level of

Kotler questions is positively increasing from red zone to green zone. This also supports the hypothesis.

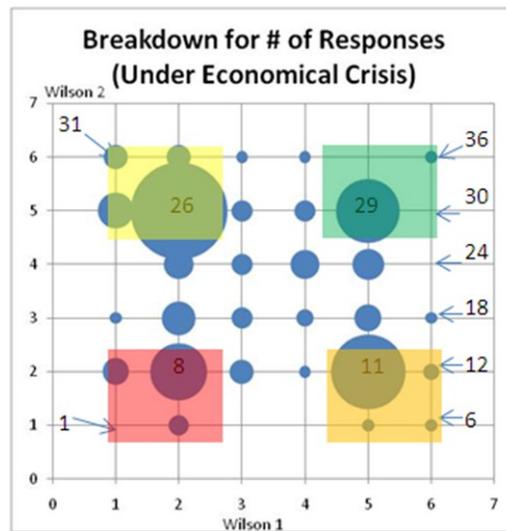


Figure 4: Breakdown of responses

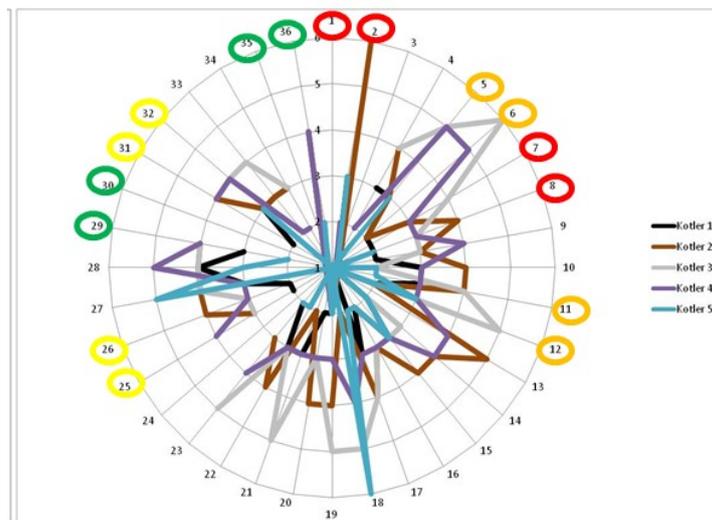


Figure 5: Radar diagram of Kotler questions through 36 boxes

However, Figure 6 shows that Box 8 has higher marks than Box 26. In other words, although orange zone-green zone increasing buying attitude relationship’s support, the yellow zone has weaker mean values than the red zone. Other results show that ICT products dominate the yellow zone, as well as the red zone. Respectively, further investigation of the pre-products part of the survey shows that the level of responders switched from ‘big partner’ to ‘owner with no partner’, as well as education level from community college to university. This has been noted as a possible reason of the question mark with this result. With one exception, this perspective also supports the hypothesis.

Analysis shows different correlations for tangibility. Survey results show that responders are not explicit for intangible products, the big majority of unanswered products came from intangibles. Besides, the same table show that answered intangibles is a part of the red zone, which is known as the most aversive zone.

Crisis based analysis gives us very similar Wilson results due to a very strong association between crisis-non crisis, as well as very similar mean numbers with only few exceptions. Therefore, it does not affect the previous judgment about the hypothesis. We noted almost zero change with crisis-non crisis Wilson answers of product number 1 and 5 (Tea and CT [Communication Technologies], which shows ultimate, 100% correlation. Property, vehicle, special technologies and consulting services have one axis with 100% correlation. IT and television have no 100% correlation at all and weaker correlation comparing to former, where other products have the weakest correlation.

Similarly, a slight increase has been noted in Kotler’s non crisis answers (Figure A2). Analysis shows that there are 4 positive correlations which are more than crisis status, but weak in general. However, each product in Kotler answers has been affected in the same direction, as well as mean numbers. Therefore, the non-crisis status of Kotler does not affect the previous judgment about the hypothesis.

With non-crisis status, there is a slight move from the red and orange zone to the yellow and green zone.

Box 26	1	2	3	4
Kotler 1 ¹	-			
Kotler 2 ²	.022			
Kotler 3 ³	-.084	.057		
Kotler 4 ⁴	-.140	.218*	.213	
Kotler 5 ⁵	-.158	.146	.251*	.171

Box 29	1	2	3	4
Kotler 1 ¹	-			
Kotler 2 ²	.727**			
Kotler 3 ³	.232	.073		
Kotler 4 ⁴	.199	.125	.352*	
Kotler 5 ⁵	.047	-.109	-.044	.290

Box 8	1	2	3	4
Kotler 1 ¹	-			
Kotler 2 ²	.078			
Kotler 3 ³	-.257	-.208		
Kotler 4 ⁴	-.240	-.262	.346*	
Kotler 5 ⁵	.050	-.339*	.180	-.244

Box 11	1	2	3	4
Kotler 1 ¹	-			
Kotler 2 ²	.223			
Kotler 3 ³	-.101	-.346*		
Kotler 4 ⁴	.173	-.204	.309	
Kotler 5 ⁵	.001	.015	.326*	.292*

*Correlation is significant at the 0.05 level (1-tailed); **Correlation is significant at the 0.01 level (1-tailed)

Figure 6: Correlation analysis of Wilson boxes

4. Findings

Although the number of responders is only 4, box number 28 signifies highest Kotler results (Figure A1 and A2). It’s noticeable that this box is near the green zone which is named as the most enthusiastic buying zone by Wilson. To put it in other words, the IT and Television purchasers of this zone prefer advertisements with humor, cash payment, shorter response time, and they do care about brand names, but they are less sensitive about close relationships with the vendor. They also state that they are less sensitive about consolidating business and home needs which might be considered to align with their answer for Kotler’s 5th question.

The objective is to understand SME’s behavior for buying technology. How do they do this -compared to their other needs- is one question, whereas why do they do this is another question. Earlier, this has been discussed and summed as ‘how’ is the key question to

scrutinize, whereas ‘why’ might be covered in further studies. This may help to validate these results with higher confidence levels.

4.1. Hypothesis

According to the data analysis and findings, hypothesis is correct.

H: When SMEs have more leisure need drivers accompanied by routine procurement, buying behavior is more eager (i.e., it gets closer to enjoyment levels of the buying attitude axis).

4.2. Research Implications

Attributes don’t always answer the reasons. For instance, as correlation analysis showed, the sector does not seem to be a factor. Staffing numbers and age are not absolute attributes either. Besides, ‘30-39 age’ mode is dominant in both red and green zones. It is likely we are talking about perceptions more than solid attributes. Analysis of perception and its cause are known a field under cognitive psychology and it requires very complex studies by nature. ‘Why they do act in this way?’ is definitely not a topic that we scrutinized here. Therefore, behaviorists may need to undertake further research to understand the reasoning behind this map. Qualitative techniques may help within this context.

4.3. Managerial Implications

4.3.1. What is in it for Marketers to SMEs?

In terms of need assessment (Wilson, 2000), IT has the highest vote, followed by CT. With the paragraph above, we stated the status with green zone. However, there are other prototypes come with the yellow and red zones. Marketers should take different attributes into account. For instance, referring previous lines, the yellow zone group is definitely more educated (university level) and tends to carry ‘sole owner’ title, rather than ‘big partner’. Latter might be difficult information to reach, but IT marketers can partner with universities and use their alumni database to promote appropriate campaigns. Contrary, once marketers need to win red zone IT purchasers, they need to be more careful with value offers that may not only include bundles with the same box products like television, but also try to cover their both business and home needs. In this case, IT marketers should investigate partnering with household appliance resellers.

4.3.2. What is in it for SMEs?

There is a confrontation opportunity for SMEs and their procurement. 360 degree assessments have widely been known in the human resources and organizational development field. A procurement version can be created to probe their need assessment and the following hypothetical questions can be answered to benefit the owner of the company:

- Should a computer really be an item for aversion?
- Are we spending for communication technologies more than we need?
- Should television be considered as a cost-saving item?
- Is this the right time to consider consulting and/or advertisement as a solid need?
- Do we care about consolidating our business and home needs? or Should we?

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Appendices:

Product Dist. - Total	Response Distribution	Cube	Kotler1	Kotler2	Kotler3	Kotler4	Kotler5	Mean
...
2,12 - 14	28	8	3	4	3	3	1	2.8
1,5,9 - 26	38	11	2	4	4	3	2	3
3,4,5,6 - 55	65	26	2	3	3	3	1	2.4
6,8 - 3	4	28	4	4	4	5	2	3.8
1,6,8 - 18	23	29	3	4	4	4	2	3.4
...
7,8,9,10,11,12 - 92	101	Blank						
	359	Grand T.						

Figure A1: Response distribution by numbers (under economic crisis)

Product Dist. - Total	Response Distribution	Cube	Kotler1	Kotler2	Kotler3	Kotler4	Kotler5	Mean
...
2,4,6 - 15	25	8	2	4	3	3	2	2.8
1,5,9 - 27	42	11	3	4	4	3	2	3.2
3,4,5,6 - 55	67	26	2	4	3	3	1	2.6
6,8 - 3	4	28	4	4	4	5	3	4
1,6,8 - 14	22	29	3	4	4	4	2	3.4
...
7,8,9,10,11,12 - 92	105	Blank						
	359	Grand T.						

Figure A2: Response distribution by numbers (with no economic crisis)

How Private Firms Manage Their Financial Policies During the Crisis Period? Evidence from the Recent Financial Crisis

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Abstract

We examine how private firms manage their financial policies during the crisis period. Using a sample of 4973 private extracted from the FAME database over the period 2004-2009, we show that financial crisis has adversely affected the leverage ratio of private firms. This effect is more pronounced on short term financing channel (such as short term debt and trade credit). The results further highlight these firms issue equity and hold cash in response to exogenous credit contractions. We do not however, find evidence that private firm substitute to net debt issue or trade credit. Overall, the results highlight that financial policies of private firms are sensitive to variations in the supply of credit.

Keywords: Financial Crisis, Financial Policies, Trade Credit

1. Introduction

The recent financial crisis, which was sparked as a result of the subprime market in the United States, is regarded by many researchers as the most severe financial crisis since the Great Depression (see for example, Mian and Sufi, 2009, Melvin and Taylor, 2009, Kahle and Stulz, 2010) because of its global effect. In the UK the effect of the financial crisis can be seen from the increased number of defaults in the financial sector. The early victims of the crisis were Northern Rock, Bradford and Bingley, Alliance and Leicester, HBOS and Cheshire and Derbyshire, building societies. Northern Rock, for example, after receiving an emergency loan from the Bank of England in September 2007 eventually went into state ownership in February 2008. Alliance and Leicester was taken over by the Spanish bank Santander in July 2008 (see for example, Hall, 2008; 2009, for details). These disruptions to the financial markets raised an important issue of the spill-over effect of the financial crisis into other sectors and the real economy.

In response to the crisis, a significant amount of research was undertaken by exploring the underlying causes of the crisis (Crotty, 2009, Carmassi et al., 2009, Murphy, 2008). In addition, other studies have focused on the impact and consequences of the financial crisis (Mian and Sufi, 2009, Greenlaw et al., 2008). However, evidence of the effects on firms' behaviour with respect to financing and investment decisions of firms is limited and the existing research has mainly concentrated on publicly listed large firms (see for example, Allen and Carletti, 2008, Duchin et al., 2010, amongst others).

Similarly little attention has been paid to the effects of credit supply shocks on the financial policies of private firms, for which the number of external sources of finance are limited. It is, however, well documented that private firms are very important for economic growth, innovation, employment, revenue generation and technological advancement (Acs and Audretsch, 1990, Kotey and Meredith, 1997, Neck and Dockner, 1987). However, despite their important role in the economic development of the global economy research on private firms is limited. In this regard, Zingales (2000) argue that '*the emphasis on large companies*

has led us to ignore (or study less than necessary) the rest of the universe: the young and small firms, who do not have access to public markets'. Bartholdy and Mateus (2011) argue that the degree of information opacity and funding sources between private and public firms is different due to which further research about the behaviour of private firms will add new insights.

This study therefore, investigates the financial policies of private firms during the recent financial crisis in response to shocks to the supply of credit in the UK. More specifically, this study investigates whether the shock to supply of credit affects the leverage of private firms and determine which components of capital structure are affected by credit supply contractions. The purpose of examining each component of capital structure individually is to comprehend the exact channel(s) through which supply shock travels. It will also help to understand better the extent of substitution across credit sources. The study also investigates how private firms minimize the effect of credit contractions by resorting to alternative sources of finance such as internal funds, net debt issue, trade credit and net equity issue. In the next section we present the relevant literature of the study.

2. Previous Literature

2.1 Financial Crisis and Firm's Leverage

It is generally argued that private firms are characterized by high information asymmetry and control considerations (Brav, 2009, Michaelas et al., 1999 a). Therefore, moral hazard and adverse selection problems may be high in these firms (Michaelas et al., 1999 a). These problems may further worsen during an economic downturn (Michaelas et al., 1999 b) which suggests that the financing mix and investment in private firms may be vulnerable to the credit supply shocks. In this regard, Gertler and Gilchrist (1993) highlight that the financing mix of firms is sensitive to the supply of bank loans. By classifying their sample firms into small and large firms, they find that the impact of tight monetary policy is higher for the financing mix of small manufacturing firms as compared to large manufacturing firms.

Similarly, other studies such as; Gertler and Gilchrist (1994), Oliner and Rudebusch (1995), and Mateut et al., (2006) have also examined this issue and have reported similar results. This may be due to the vulnerability of small firms to market friction. It is also argued that when a financial shock hits the banking system; it has a greater effect on the lending of credit to small businesses (Berger and Udell, 2002, Hancock and Wilcox, 1998). This is because small firms have few close substitutes for a bank loan. Therefore, a reduction in loans to small businesses has a greater effect on its activities compared to large firms (Hancock and Wilcox, 1998). Also, Bruno (2009) shows that when a financial shock hits the banking system it has a large affect on the financing and investment of small businesses.

There is also evidence which suggests that the leverage ratio of firms which are dependent on bank loans is sensitive to variations in the supply of bank loan (Chava and Purnanandam, 2011). Leary (2009) also shows that the capital structure of small bank dependent firms is more sensitive to the availability of bank loans than large firms, which have access to capital markets. Similarly, Lim (2003) examines the sources of finance before and after the financial crisis in Korea and found contrasting results. The findings suggest that the proportion of loans from financial institutions decreased in the financial structure of large firms after the crisis while small, profitable firms had better access to credit from financial institutions after the crisis. However, in contrast to these arguments, findings of some other studies suggest that a credit supply shock has little effect on the financing mix of firms. Lemmon and Roberts (2010) for example, find negligible effect of credit contractions on the leverage of firms. Similarly, Lin and Paravisini (2010) did not find any significant relationship between firms' leverage and credit shortage in their sample of firms.

2.2 *Financial Crisis and Alternative Sources of Finance*

It is generally argued that when the supply of external credit squeezes, then firms find substitutes for alternative sources of finance such as, internal finance, equity and trade credit (Petersen and Rajan, 1997, Leary, 2009, Lin and Paravisini, 2010). However, as mentioned earlier, private firms face a greater information problem, which may worsen further during an economic downturn (Michaelas et al., 1999 b). As a result, these firms might prefer to use a funding source that is less sensitive to the information problem. In this regard, internal finance is generally regarded as the cheapest source of finance. In addition, it is less sensitive to the information problem (Myers, 1984, Myers and Majluf, 1984). The pecking order theory also suggests that firms prefer internal finance over external credit. Similarly, Leary (2009) finds that firms with no access to capital markets used more internal finance and equity during the credit crunch.

However, Baum et al., (2006), highlight that when macroeconomic or idiosyncratic uncertainty increases, firms tend to hold more liquid assets. As private firms are more sensitive to both of these uncertainties they may tend to hold more cash reserves. Faulkender (2002) argues that small firms face high information asymmetry problems and, as a result, they may not be able to raise cash in the future, they therefore hold more cash. Similarly, Lin and Paravisini (2010) report that firms hold more cash following credit contractions, which is consistent with the precautionary saving motive. In addition, firms might substitute to equity finance to hedge themselves from the negative effect of the credit contractions. Leary (2009) for example, shows that small firms use greater equity finance during tight monetary conditions. In a related context, the findings of Lin and Paravisini (2010) reveal that firms increase the use of equity financing following negative shocks to bank credit. There is, however, limited evidence of substitution towards alternative sources of finance following negative shocks to the supply of credit (Lemmon and Roberts, 2010).

Trade credit is another alternative source of short term finance for private firms. Therefore, in response to a credit drought, firms might substitute to trade credit to lessen the effect of credit contractions. In this regard, Petersen and Rajan (1997), for example, argue that small firms, which do not have access to capital markets, increase the use of trade credit when faced by limited, or no, availability of credit from financial institutions. Their results support the role of trade credit as a potential substitute for bank credit. Other studies have also confirmed the above findings (see for example, Atanasova and Wilson, 2003; 2004; Nilsen 2002; Mateut et al., 2006).

However, the findings of some other studies do not support the notion that small firms increase the use of trade credit as a substitute for bank finance during tight monetary conditions (see for instance, Gertler and Gilchrist, 1993; Bernanke and Gertler, 1995). This might be due to the unfavourable terms of credit offered to firms as a substitute to a bank loan. Similarly, Oliner and Rudebusch (1996) find '*no evidence that small firms increase their use of trade credit during period of tight money.....*'. In this regard, Taketa and Udell (2007) argue that for SMEs trade credit and bank lending complement each other rather than act as substitutes. Also, Love and Zaidi (2010) find that, financial crisis reduced the availability of both bank credit and trade credit. To summarize the above discussion, it seems that there is a lack of consensus on the role of alternative sources of finance during the crisis period, which highlights the need for more research in this area.

3. Research Methodology and Data

3.1 Empirical Strategy

The main aim of this research is to investigate the effect of the credit crisis on financial policies of private firms in the UK. To achieve the objective of the study, our identification strategy has three elements that help to overcome this problem. First, we identify the exogenous credit crisis. The recent credit crisis 2007-2009 provides us with such an event, and this has been argued in some recent papers (Kahle and Stulz, 2010; Duchin et al., 2010). Duchin et al., (2010) for instance, argue that ‘*The crisis represents an unexplored negative shock to the supply of external finance for non-financial firms*’. Second, our empirical strategy relies on the firm fixed effect model. As this study employs panel data, there is a potential concern of unobserved heterogeneity. This is because the data contains multiple observations per firm. The fixed effect model will help to account for this concern. In addition, as this study identifies the supply channel, the fixed effect model can be regarded as the most appropriate for this investigation. The fixed effect regression model that we use in this study is highlighted below.

$$Y_{it} = \lambda_{1i} + \Pi_1 * Crisis_{it} + \delta_2 * \Sigma X_{it} + \delta_3 * Crisis * \Sigma X_{it} + \mu_{it} \quad (1)$$

The last element of our identification strategy is the inclusion of a set of control variables that partial out the effect of demand factors on our variable of interest. We use variables (such as size, growth and profitability) highlighted in latest research findings to be consistently and closely related to firm financing decisions (Rajan and Zingales, 1995; Leary, 2009). Love et al., (2007) however, observe that ‘*..causal factors that are either time-invariant (e.g., industry) or slow changing (e.g., size) should be captured by the fixed effects*’. We therefore include only return on assets, and growth and their interaction with crisis dummy in regression models as proxy for firm demand. These variables however change with the dependent variables. In light of all these points we construct the following models.

$$\text{Long term debt} = \beta_0 + \beta_1 * ROA + \beta_2 * GT + \beta_3 * CR + \beta_4 * GT * CR + \beta_5 * ROA * CR + \mu_{it} \quad (2)$$

$$\text{Short term debt} = \beta_0 + \beta_1 * ROA + \beta_2 * GT + \beta_3 * CR + \beta_4 * GT * CR + \beta_5 * ROA * CR + \mu_{it} \quad (3)$$

$$\text{Trade Credit} = \beta_0 + \beta_1 * CF + \beta_2 * GT + \beta_3 * CR + \beta_4 * GT * CR + \beta_5 * CF * CR + \mu_{it} \quad (4)$$

$$\text{Net Debt Issue} = \beta_0 + \beta_1 * ROA + \beta_2 * GT + \beta_3 * CR + \beta_4 * GT * CR + \beta_5 * ROA * CR + \mu_{it} \quad (5)$$

$$\text{Net Equity Issue} = \beta_0 + \beta_1 * ROA + \beta_2 * GT + \beta_3 * CR + \beta_4 * GT * CR + \beta_5 * ROA * CR + \mu_{it} \quad (6)$$

$$\text{Cash Reserve} = \beta_0 + \beta_1 * CF + \beta_2 * GT + \beta_3 * CR + \beta_4 * GT * CR + \beta_5 * CF * CR + \mu_{it} \quad (7)$$

3.2 Data

Data is extracted from Financial Analysis Made Easy (FAME) database for the years 2004-2009. We exclude assurance companies, guarantees, limited liability partnerships, public investment trusts and unlimited companies (Michaely and Roberts, 2007; Brav, 2009). Our sample only includes firms, which have registered offices in the United Kingdom. We exclude firms that operate in financial sectors for standard reasons. In addition, we exclude firms in public sector and regulated industries (Duchin et al., 2010; Chava and Purnanandam, 2011). The issue of missing observations is a serious problem in any research study. To avoid this problem the sample firms included in this study must have no missing values for the key variables of the study such as short term debt, long term debt, trade credit, issued capital, cash and cash equivalent, EBIT, and total assets. This is in line with the existing literature (for example, Sufi, 2009; and Lemmon and Roberts, 2010). The final sample thus includes a total of 4973 firms. In addition, for addressing the outliers problem we winsorized the top and bottom 1% of all variables. This is in line with previous literature (see for example, Love et al., 2007).

4. Results

4.1 Financial Crisis and the Leverage Ratios

To examine the effect of the credit crisis on the leverage ratios of private firms, we first run the fixed effect regression on total debt ratio. Next, we divide the total debt ratio into its components such as short term debt, long term debt and trade credit, then we ran separate regressions on each of these variables. The coefficients in table 1 and subsequent tables should be interpreted as follows. CR represents crisis dummy for the crisis period. The impact on the dependent variable during the crisis period is given by the sum of the coefficient associated with the given variable and variable interacted with the crisis dummy. The crisis dummy is interacted with control variables to determine the change in response relative to the pre-crisis period. The coefficient referring to the pre-crisis period is given by the non-interacted variables. CF is the measure of cash flow, GT is the measure of sales growth, and ROA is the measure of firm performance. ***, **, * representing 1%, 5% and 10% levels of significance respectively.

Results from the estimation of model 1 are presented in Table 1. The dependent variable in model 1 is the total debt ratio. It shows that all independent variables have expected signs and are highly significant. As expected, the coefficient on return on assets (ROA) variable is negative and significant at the level of 1% or better in both time periods. This is consistent with the predictions of the pecking order theory. This implies that profitable firms use less debt (Gaud et al., 2007; Aggarwal and Kyaw, 2010; Voutsinas and Werner, 2011) during the crisis period. Similarly, the coefficient of the growth variable is positive in both the pre-crisis and the crisis periods and is significant at the level of 1% or better. This implies that growing firms need more external finance which is consistent with earlier published studies (Michael et al., 1999a; Sogorb-Mira, 2005). We focus on our main variable of interest in the subsequent models.

The main variable of interest is the crisis dummy. The results of Model 1 highlight that the coefficient on the crisis dummy is negative and significant at the level of 1% or better. This implies that the financial crisis has a negative impact on a firm's total debt ratio. In other words, the flow of credit to these firms was reduced during the crisis period. This suggests that supply of credit is an important determinant of firm financing decisions. Since total debt encompasses all forms of debt, which means that aggregate external financing activities of private firms contracted in response to the credit supply shocks. However, from the results of model 1 the impact on the components of the firm financial mix is not clear. To investigate this further, the model 2 is then run on long term debt.

Table 1: Effect of financial Crisis on Leverage Ratio

Variables	Model 1	Model 2	Model 3	Model 4
	Total Debt	Long term debt	Short term debt	Trade credit
ROA	-0.312 (-12.02)***	-0.080 (-4.07)***	-0.174 (-11.01)***	-----
GT	0.026 (4.19)***	0.011 (2.12)**	-0.003 (-0.82)	0.009 (2.31)**
CF				0.046

				(4.08)***
CR*ROA	-0.225 (-7.51)***	-0.112 (-5.22)***	-0.051 (-2.72)***	-----
GT*CR	0.049 (5.04)***	0.004 (0.48)	0.020 (2.91)***	0.040 (6.51)***
CF*CR				-0.027 (-2.13)**
CR	-0.059 (-5.66)***	-0.006 (-0.79)	-0.025 (-3.47)***	-0.043 (-6.59)***
C	0.526 (78.04)***	0.193 (33.78)***	0.172 (36.09)***	0.172 (39.73)***
R-squared	0.853	0.853	0.750	0.909
No of Obs	21559	21979	22039	10041
F-statistics	24.171	24.628	12.695	32.071
Prob(F-statistics)	0.000	0.000	0.000	0.000

Results from the analysis of model 2 are presented in table 1. These results highlight that the sign on the coefficient of the crisis dummy is negative, but statistically insignificant. This implies that the credit crisis had no significant impact on the long term debt ratio.

To investigate the impact on short term debt the fixed effect regression model 3 and associated results are reported in table 1. Results show that coefficient on the crisis dummy is negative and significant at the 1% level or better. This reveals that the flow of short term credit to private firms is squeezed as a result of the credit crisis. This suggests that the financial crisis has impaired the short term financing channel for private firms. As private firms are generally considered risky for the reason discussed above, lenders may have squeezed the availability of credit to these firms because it has been shown that banks only consider safer loan options during tight credit conditions (Lang and Nakamura, 1995).

Finally, the fixed effect regression model 4 is run on trade credit and reported the results in table 1. The dependent variable in model 4 is trade credit scaled by total assets. The use of this measure is motivated by the fact that research suggests that '*...it is a better measure for studying the role of trade credit as a source of finance for firms' assets*' (Atanasova and Wilson, 2003). Since we are interested in the financing motive of trade credit during the crisis period, this measure is the most appropriate in our study. The results highlight that all variables are statistically significant. The significance of the control variables in the equation suggest that model is the best fit. This is also evident from the high R-squared value of 91%.

Interestingly, the coefficient on the crisis dummy variable is negative and significant at the 1% level or better. The negative coefficient reveals that supply of trade credit decreased during the crisis period. The general expectation is an increase in the supply of trade credit during the crisis period, but our result finds the opposite. The reduction of trade credit also shows the lack of substitution towards this short term source of finance during the crisis

period. The results further suggest that the supply of trade credit decreases when the financial crisis reduces the availability of credit, supporting the view that trade credit is a complement for bank credit rather than a substitute.

These results thus contribute to the existing literature by first, suggesting that both the demand and supply factors are crucial in understanding the firm financing decisions. Second, it suggests that the short term financing channel (i.e. short term credit and trade credit) is sensitive to variations in the supply of credit. Third, it suggests that trade credit does not compensate for a reduction in the supply of credit from financial institutions. In the next section, we examine the effect of credit supply shocks on the behaviour of alternative sources of finance.

4.2 *The Use of Alternative Sources of Finance*

To investigate whether private firms substitute alternative sources of finance to offset the reduction of debt in their capital structure, the fixed effect panel regression are run on net debt issued, net equity issued, and internal finance. When we run model 5, the fixed effect panel regression model is run on net debt issued. The results are presented in table 2, which highlights that all the variables are statistically significant. The coefficient of crisis dummy is - 0.26 and is significant at the 1% level. This is evidence that net debt issuance activities of private firms are adversely affected by the credit crisis. This result confirms our earlier findings which suggest that contractions in credit supply have negatively affected the leverage ratios of private firms. Overall, the fixed effect results suggest that net debt issue of private firms was reduced during the crisis period.

Model 6 is then run on net equity issued. The results are also reported in table 2. The coefficient on the crisis dummy is positive and significant at the 1% level or better. These results show that net equity issued by private firms increased following contractions in the supply of credit. This is consistent with the credit supply effect, that is, when there are exogenous shocks to the supply of credit, this reduces credit availability and firms therefore issue more equity to offset the adverse effect of credit contractions. It implies that private firms substitute equity finance to minimize the effect of credit supply contractions.

Next, we examine the cash reserve to see whether private firms increased the use of internal finance or hold cash during the crisis period. From the estimation of model 7 the regression is run on cash reserves and the results are reported in table 2. The results reveal that the coefficient on the crisis dummy variable is positive and significant. This indicates that private firms held more cash during the crisis period. This is consistent with the precautionary saving motive. Since the financial crisis increased uncertainty about the availability of credit, in response to that, private firms held more cash during the crisis period to hedge themselves from the unexpected reduction of credit in the near future. Our result is in line with the findings in Lin and Paravisini (2010). They report that public firms use more equity financing and hold cash in response to credit contractions, consistent with the precautionary saving motive. Our results, however, do not seem to be in line with some of the recent findings in this area (see for example, Leary, 2009; Lemmon and Roberts 2010). Our result adds to this strand of literature first, by providing evidence from the perspective of private firms. Second, the results suggest that private firms hold more cash in response to exogenous credit contractions.

Table 2: Financial Crisis and Alternative Sources of Finance

Variables	Model 5	Model 6	Model 7
	Net Debt Issue	Net Equity Issue	Cash Reserve
ROA	-1.201 (-9.94)***	-0.062 (-2.27)**	----
GT	0.253 (6.38)***	0.033 (3.44)***	5.049 (3.16)***
CF			22.587 (10.79)***
CF*CR	----	----	5.021 (1.46)
CR*ROA	0.269 (2.22)**	0.006 (0.27)	----
GT*CR	0.168 (2.85)***	-0.027 (-1.83)*	-4.524 (-2.77)***
CR	-0.256 (-4.16)***	0.040 (3.21)***	4.390 (2.27)**
C	-0.026 (-0.61)	0.962 (128.01)***	-4.256 (-2.06)***
R-squared	0.220	0.321	0.351
No of Obs	20476	9990	6764
F-statistics	1.111	1.519	1.291
Prob(F-statistics)	0.000	0.000	0.000

5. Conclusion

This paper examines the effects of credit contractions on financial policies of private firms. The results suggest that credit supply shocks have adversely affected the total debt ratio of private firms. The results further highlight that credit contractions have impaired short term financing channels (such as short term debt and trade credit) while the credit crisis has no significant effect on the long term financing channel. As a consequence, private firms hold cash and issue equity to hedge themselves from the negative effect of credit contractions. We, however, do not find any evidence that private firms substitute to net debt issue and trade credit. Overall, our results suggest that financial policies of the private firms are vulnerable to variations in the supply of credit.

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Estimating Community Drug Usage Patterns by the Analysis of Waste Water

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Abstract

Illicit drugs such as cocaine and amphetamine are increasingly finding their way into surface waters mainly due to the discharge of treated and untreated sewage. As a result these drugs are increasingly being detected in such aqueous environments. Developing simple, quick, selective and sensitive analytical methods for their detection would help to estimate their levels of abuse within a particular geographical location.

Mixed drug standards containing up to 31 illicit drugs were analysed prior to and after derivatisation. A *PerkinElmer* gas chromatograph-mass spectrometer (GC-MS) in electron impact (EI) ionisation was used, fitted with a Supelco Equity -5 column.

Various derivatisation agents such as *N,O*-Bis(trimethylsilyl)trifluoroacetamide (BSTFA), *N*-Methyl-*N*-trimethylsilyltrifluoroacetamide (MSTFA) and pentafluoropropionic anhydride (PFPA) were investigated to determine the most suitable for the mixed drugs under investigation. An in-house database of retention times, retention indices, mass spectra, quantifier and qualifier ions for the derivatised drugs has been compiled to aid in the identification of the target drugs in real samples. Autosampler and storage stability of the derivatised mixed standards in methanol has been investigated and drugs such as amphetamine and ecstasy have been shown to be more stable than cannabis and ecgonine methyl ester. Solid phase and liquid-liquid extraction methods for sample clean-up have also been compared for suitability of extraction. Initial findings show comparable results between the two extraction methods regarding sample cleanup and recovery.

Once validated, the method will be applied to waste and surface water samples.

Keywords

GC-MS, illicit drugs, PFPA, sewage, waste water,

1. Introduction

Illicit drugs that have been available on the drug black-market for decades include cocaine, heroin and cannabis as well as stimulants such as amphetamine and ecstasy. As these illicit drugs became legislated against and stiffer penalties for their possession or supply were enforced, 'newer' illicit drugs appeared. Since the late 1990s, these 'newer' illicit drugs have included piperazine-derived compounds such as *l*-benzyl piperazine (Peters, et al., 2003) and in more recent years, the beta-keto amphetamines such as mephedrone and methylone (Measham, et al., 2010 and Meyer, et al., 2010).

Piperazines are synthetic drugs that are chemically and pharmacologically similar to amphetamine type stimulants. Therefore analytical methods used for amphetamines can also be applied to piperazines (Staack, 2007). In addition, piperazines and amphetamines are known to be marketed to and consumed by the same demographic population that also attends clubs, raves and music festivals and they show very similar abuse and dependence potential (*ibid*).

Since 2009, beta-keto amphetamines have increased in popularity amongst the same demographic population that uses piperazines. Beta-keto amphetamines are semi-synthetic analogues of cathinone derived from the leaves of the *Catha edulis* (khat) plant and therefore referred to as designer drugs. However, fully synthetic analogues have also been made in clandestine laboratories (Measham, et al., 2010). Their chemical similarity to amphetamine and the legalisation of illicit drugs such as amphetamine, cocaine and ecstasy has made them popular as alternatives to these types of drugs (*ibid*). This research therefore not only seeks to detect the most commonly abused illicit drugs but also unscheduled piperazines and other novel illicit drugs such as beta-keto amphetamines.

According to the World Drug Report of the United Nations Office on Drugs and Crime (UNODC, 2011), in 2009 approximately 149 - 272 million people worldwide used some form of illicit drug. Therefore it is not surprising that these drugs are finding their way into wastewater through their elimination in urine and faeces (Castiglioni, et al., 2008). As a result illicit drugs, pharmaceuticals and personal care products (PPCPs) have in recent years generated interest within the scientific community for their contribution to water pollution (Kasprzyk-Hordern, et al., 2007 and 2009a&b).

Global consumption data for illicit drugs has traditionally been estimated based on criminal and medical records, drug monitoring, drug seizures and population surveys (González-Mariño, et al., 2010). However these methods tend to be time-consuming in addition to creating a time-lag in detecting changing patterns of abuse within the local community. Since illicit drugs are ultimately excreted as the parent drug and its metabolites in urine and faeces, sewage has also been identified as a relatively new matrix for their detection (van Nuijs, et al., 2010).

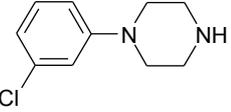
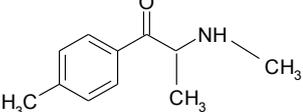
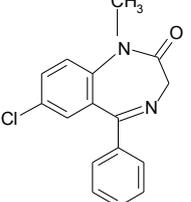
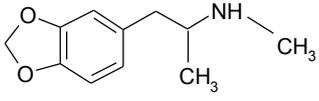
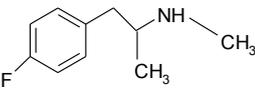
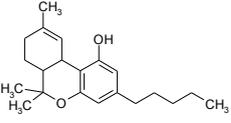
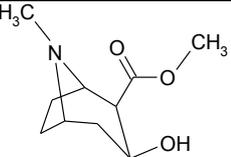
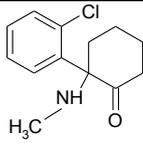
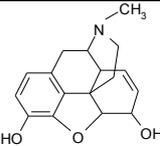
This area of research termed as sewage epidemiology (*ibid*) is relatively new and the majority of studies have only been carried out by a few research groups during the last seven years (*ibid*). This previous research has focused on PPCPs with some illicit drugs tagged on (Nödler, et al., 2010) and very few research groups have specifically looked at the presence of more than 15 illicit drugs in environmental samples such as waste water and surface water (Postigo, et al., 2011).

The more commonly applied extraction and analytical techniques published for the detection of pharmaceuticals and illicit drugs in aqueous environmental samples have primarily been solid phase extraction (SPE) followed by liquid chromatography-coupled to tandem mass spectrometry (LC-MS/MS) (Castiglioni, et al., 2008; van Nuijs, et al., 2010). Liquid-liquid extraction (LLE) and gas chromatography-mass spectrometry (GC-MS) have only been used a few times (Mari, et al., 2009; González-Mariño, et al., 2010).

With regards to illicit drugs, both LC-MS and GC-MS have been used successfully with each technique offering advantages on particular classes of drugs. LC-MS for instance does not rely on the volatility of a compound and is also suitable for thermally labile analytes. In addition, there is rarely a need for pre-column derivatisation. However, the LC-MS interfaces are more expensive compared with GC-MS. This can limit their applicability in less developed countries (Jjemba, 2006). On the other hand, Heath, et al. (2010) have shown GC-MS to be more sensitive in the analysis of acidic drugs in more complex matrices and Fatta, et al. (2007) in their review found GC-MS to have lower limits of detection. In light of this, it was decided to investigate GC-MS as an alternative to popularly used LC-MS in the analysis of 31 piperazines, beta-keto amphetamines and other illicit drugs in waste water and surface water samples. The structures of some of the target drugs investigated are shown in Table 1. The varying pK_a values and functional groups present a challenge in developing one method for the detection and quantification of the target drugs. The initial part of the study involved determining the necessity for derivatisation. Various derivatising agents based on silylation, acylation and alkylation were investigated. For sample cleanup and extraction

efficiency, different types of SPE cartridges and LLE methods were also evaluated. Stability of the mixed drug standards under various conditions was then investigated to determine suitable storage conditions. The findings presented will be used towards further method development.

Table 1: Structures, formulae, molecular weights and pK_a values of some target analytes

 <p>1-(3-Chlorophenyl)Piperazine, C₁₀H₁₃ClN₂, 196.5 g/mol, pK_a 8.64*</p>	 <p>Mephedrone, C₁₁H₁₅NO, 177.24 g/mol, pK_a not known</p>	 <p>Diazepam, C₁₆H₁₃ClN₂O, 284.74 g/mol, pK_a 3.3*</p>
 <p>3,4-Methylenedioxymethamphetamine, (ecstasy) C₁₁H₁₅NO₂, 193.2 g/mol, pK_a 8.69*</p>	 <p>4-Fluoromethamphetamine, C₁₀H₁₄NF, 167.22 g/mol, pK_a not known</p>	 <p>Δ⁹-Tetrahydrocannabinol, (cannabis), C₂₁H₃₀O₂, 314.46 g/mol, pK_a not known</p>
 <p>Ecgonine Methyl Ester, C₁₀H₁₇NO₃, 199.3 g/mol, pK_a not known</p>	 <p>Ketamine, C₁₃H₁₆ClNO, 237.7 g/mol, pK_a 7.5*</p>	 <p>Morphine, C₁₇H₁₉NO₃, 285.14 g/mol, pK_a 8.0 & 9.9*</p>

*Moffat, A.C. et al., 2011

2. Experimental

2.1 Chemicals and Materials

The target analytes, deuterated analogues (used as internal standards), reagents and solvents used are listed in Table 2. All drug standards were of analytical grade (purity ≥97%), except where indicated, and were purchased as powders or as 1mg/ml standard solutions in methanol or acetonitrile. For powders, 1mg/ml solutions in methanol were made and all standards were further diluted to individual or mixed working solutions with concentrations ranging from

0.02 to 0.1mg/ml. All standards were stored at -20°C in the dark. Alkane standards were made at concentrations of 1mg/ml in pentane and further diluted to mixed working standards of 0.1mg/ml.

An Elga Purelab Option (Veolia, UK) was used to obtain deionised water. A Supelco Visiprep™ Vacuum Manifold with 24 ports attached to a pump was used for the SPE extractions. A MiVAC DNA concentrator (Genevac, UK) was used for evaporation of samples of 4ml or less. For larger samples, a rotary evaporator was used. Oasis MCX®, MAX® and HLB® SPE cartridges were obtained from Waters (Ireland).

Table 2: Drug standards, chemicals and suppliers

<u>Drug</u>	<u>Drug</u>	<u>Solvents</u>
6-Acetylmorphine ^a	1-(2-Methoxyphenyl)	Acetone ^h
Amitriptyline Hydrochloride ^a	Piperazine ^b	35% Ammonium Hydroxide ^h
Amphetamine Sulfate ^a	1-(4-Methoxyphenyl)	Chloroform ^h
1-Benzylpiperazine ^b	Piperazine ^a	37% Hydrochloric Acid ^h
Butylone Hydrochloride ^c	Methylbenzodioxolylbutanamine Hydrochloride ^e	Ethanol ^h
Cannabidiol ^a	1-Methyl-4-Benzylpiperazine ^a	Ethyl Acetate ^h
Cannabinol ^a	3,4-Methylenedioxymethamphetamine ^b	Formic Acid ^h
Cocaine- <i>d</i> ₃ ^e	3,4-Methylenedioxymethamphetamine- <i>d</i> ₅ ^e	Methanol ^h
Cocaine Hydrochloride ^a	1-(2-Methylphenyl)Piperazine ^b	Pentane ^h
1-(3-Chlorophenyl)Piperazine ^a	1-(4-Methylphenyl)Piperazine ^a	2-Propanol ^h
Diazepam ^a	Morphine- <i>d</i> ₃ ^e	Sodium Sulfate ⁱ
Ecgonine Methyl Ester Hydrochloride Hydrate ^a	Morphine Sulphate	<u><i>n</i>-Alkanes</u>
2-(Fluorophenyl)Piperazine ^a	Pentahydrate ^a	Decane ^h , general
4-(Fluorophenyl)Piperazine ^a	11-Nor-9-Carboxy- Δ 9-Tetrahydrocannabinol ^a	Docosane ^f
4-Fluoromethamphetamine Hydrochloride ^c	Piperazine ^b	Dodecane ^h , lab reagent
3-Fluoromethcathinone Hydrochloride ^c	Quinoline ^a	Eicosane ⁱ
Heroin ^b	Δ 9-Tetrahydrocannabinol ^a	Hexadecane ^h , general
11-Hydroxy- Δ 9-Tetrahydrocannabinol ^a	1-(3-Trifluoromethylphenyl)Piperazine ^f	Hexacosane ^f
Ketamine ^a	1-(4-Trifluoromethylphenyl)Piperazine ^b	Octadecane ⁱ
Mephedrone Hydrochloride ^d		Octacosane ^f
Methadone ^e	<u>Derivatising agents</u>	Octane ^h , lab reagent
Methamphetamine hydrochloride ^a	Acetic Anhydride ^a	Tetracosane ^f
	<i>N,O</i> -Bis(trimethylsilyl)trifluoroacetamide (BSTFA) with 1% trimethylchlorosilane (TMCS) ^g	Tetradecane ⁱ
	Heptafluorobutyric Anhydride (HFBA) ^a	

	<i>N</i> -Methyl- <i>N</i> -trimethylsilyltrifluoroacetamide (MSTFA) ^a Pentafluoropropionic Anhydride (PFPA) ^a Pyridine ^a Trimethylphenylammonium hydroxide (TMPAH) ^g	
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Sigma^a, Fluka^b, National Measurement Institute, Australia^c, Toronto Research Chemilab, Canada^d, Cerilliant^e, Alfa Aesar^f, Supelco^g, Fisher^h, Acrosⁱ

2.2 Sampling and Spiking

Grab samples of raw and treated waste water (2L each) were collected from a waste water treatment plant in Cambridge. They were stored in polypropylene containers at -20°C until processed. Before analysis samples were vacuum filtered through GF/F (0.7µm) glass microfiber filters (Whatman International Ltd., Maidstone, England). SPE and LLE of raw waste water was conducted by spiking 450ml with 3,4-Methylenedioxymethamphetamine-*d*₅ and cocaine-*d*₃ and subjecting them to extraction methods as detailed in sections 2.3 (a) and (b).

2.3 Sample Preparation

a) Solid phase extraction

Three different types of SPE cartridges (Oasis MCX[®], Oasis MAX[®] and Oasis HLB[®]) were investigated. 2ml of deionised water was spiked with a mixed standard of target analytes ranging in concentration from 0.01 to 0.05mg/ml and extracted following manufacturer's recommendations and previously published methods as cited (Table 3). Adjustment of sample pH was conducted with 37% hydrochloric acid or 35% ammonium hydroxide (NH₄OH) as appropriate. The SPE cartridges were dried under low vacuum before elution.

b) Liquid-liquid extraction

Two different LLE methods were tested using either chloroform:isopropanol (3:1v/v) as described by Tsutsumi, et al. (2005) or chloroform:ethyl acetate:ethanol (3:1:1v/v) as described by Raikos, et al. (2009). A mixed drug standard with individual drugs ranging in concentration from 0.01 to 0.05mg/ml was added to 2ml of deionised water at pH 10 followed by extraction with 5ml of the solvent (2 x 1.5ml and 1 x 2ml portions).

For both SPE and LLE, triplicate extractions of spiked samples were conducted. Blank extractions using unspiked deionised water and unextracted standards for recovery calculations were analysed simultaneously. The eluent were evaporated and derivatised prior to injection into the GC-MS.

c) Derivatisation

For the derivatisation trials the silylating agents *N,O*-Bis(trimethylsilyl)trifluoroacetamide (BSTFA) and *N*-Methyl-*N*-trimethylsilyltrifluoroacetamide (MSTFA) did not require further evaporation. The acylating agents acetic anhydride:pyridine (3:1v/v), heptafluorobutyric anhydride (HFBA) and pentafluoropropionic anhydride (PFPA):ethyl acetate (2:1v/v) needed an additional evaporation and reconstitution step. The alkylating agent trimethylphenylammoniumhydroxide (TMPAH) is an on column derivatising agent and hence required the least preparation.

For the above mentioned derivatising agents, a mixed drug standard (0.1mg/ml) was evaporated followed by the addition of 0.2ml of the derivatising agent. After vortexing for a few seconds, the mixture was heated at 70°C for 60 minutes, with the exception of TMPAH which does not require heating prior to injection.

Table 3: Protocols for solid phase extraction

SPE CARTRIDGE	Oasis MCX [®] (60mg,3mL)	Oasis MAX [®] (60mg,3mL)	Oasis HLB [®] (60mg,3mL) ^b
SAMPLE pH	2 and 7	2 and 7	7
CONDITION	2ml methanol 2ml deionised water	2ml methanol 2ml deionised water	2ml ethyl acetate 2ml acetone 1ml deionised water
SAMPLE LOADING FLOWRATE	10ml/min	10ml/min	10ml/min
RINSE	1ml 2% formic acid 1ml deionised water	2ml 5% NH ₄ OH in methanol	2ml 5% methanol
DRYING TIME	5mins	5mins	5mins
ELUTION	2ml methanol 2ml 5% NH ₄ OH in acetone:ethyl acetate (1:1v/v) ^a	2ml methanol 2ml 2% formic acid.	2ml ethyl acetate 8ml acetone

Bones, et al. (2007)^a, González-Mariño et al., 2010^b

d) Stability studies

For initial stability studies, a derivatised mixed drug standard prepared in methanol with individual drugs ranging in concentration between 0.02 to 0.09 mg/ml was used. Autosampler stability was conducted over a 14 hour period and storage stability was conducted over 6 weeks at -20°C and 4°C.

2.4 Instrumental Parameters

A *PerkinElmer* Clarus 500 Gas Chromatograph Mass Spectrometer (GC-MS) fitted with a Supelco EquityTM-5 capillary column (30m x 0.25 μ m x 0.25mm i.d.) was used. The carrier gas was helium at a flow rate of 1ml/min. The GC oven program was as follows: initial temperature of 80°C, held for 2 minutes, then increased to 280°C at 8°C/min, held for 3 minutes. The GC-MS transfer line and source temperatures were set at 260°C and 230°C, respectively. The injector temperature was set at 250°C. The mass spectrometer was operated in the electron impact ionization mode (+70 eV) and the MS scan was (m/z 40–620). The total run time was 32min. The injection volume was 1 μ l at a split ratio of 20:1.

3. Results & Discussion

3.1 Qualitative aspects

Table 4 depicts the retention times (RT), relative retention times (RRT), retention indices (RI) and diagnostic ions for the underivatized and derivatized target analytes. The analytes were identified by comparing their RT and RRT with those of positive controls. Although these parameters are normally sufficient to positively identify a compound (Levine, 2006) the RI can be further used to confirm the identification of a compound since it is less dependent on instrumental fluctuations as compared with RT & RRT (Babushok, et al., 2007). In addition, identification of the target analytes was attained by monitoring several designated ions and comparing their peak area ratios (PAR) with those from a positive control. When using GC-MS, comparison of full-scan mass spectra with mass spectral library can also aid in identification. However, mass spectral libraries are not exhaustive especially for newer illicit drugs or derivatized analogues. As depicted in Figure 1 all 31 target analytes could be positively identified using the criteria mentioned above.

Table 4: Identification parameters of underivatized and derivatized target analytes. Ions used for quantification are underlined.

Drug Standard & Molecular Weight	Underivatized Diagnostic Ions	PFPFA Derivatized Diagnostic Ions	RT of Derivatized Drug / min	RI*
Quinoline, 129.16 g/mol	75,102, <u>129</u>	75,102, <u>129</u>	9.47	1225
Piperazine, 86.14 g/mol	<u>44,56,57,85,85</u>	216,231, <u>259,359</u>	10.16	1245
Amphetamine, 135.21 g/mol	<u>44,56,65,91</u>	91,118, <u>190</u>	10.53	1256
Methamphetamine, 149.23 g/mol	44, <u>58,91</u>	118,160, <u>204</u>	12.34	1409
4-Fluoromethamphetamine, 167.22 g/mol	<u>58,83,109</u>	136,160, <u>204</u>	12.5	1414
3-Fluoromethcathinone, 181.21 g/mol	56, <u>58,75,95,123</u>	123,160, <u>204</u>	12.76	1423
Ecgonine Methyl Ester, 199.25 g/mol	<u>82,83,96,199</u>	82,94,119, <u>182</u>	13.32	1441
Mephedrone, 177.24 g/mol	<u>58,65,91,119</u>	119,160, <u>204</u>	14.62	1482
1-Benzylpiperazine, 176.26 g/mol	91,119, <u>134,176</u>	146,175,231, <u>322</u>	17.04	1666
4-(Fluorophenyl)Piperazine, 180.22 g/mol	122, <u>138,180</u>	123,150,179, <u>326</u>	17.06	1667
1-(3-Trifluoromethylphenyl) Piperazine, 230 g/mol	145,172, <u>188,230</u>	172, <u>200,229,376</u>	17.2	1672
3,4-Methylenedioxyamphetamine-d ₃ , 198.11 g/mol	<u>62,78,136</u>	136,163, <u>208,344</u>	17.23	1673
3,4-Methylenedioxyamphetamine, 193.2 g/mol	<u>58,77,135</u>	135,162, <u>204,339</u>	17.28	1675
Methylbenzodioxolylbutanamine, 207.27 g/mol	<u>72,89,134</u>	160,176, <u>218,353</u>	18.09	1804
1-(4-Trifluoromethylphenyl) Piperazine, 230.23 g/mol	145,172, <u>188,230</u>	172, <u>200,229,376</u>	18.12	1805
1-(4-Methylphenyl)Piperazine, 176.26 g/mol	91,119, <u>134,176</u>	119,146,175, <u>322</u>	18.27	1811
1-Methyl-4-Benzylpiperazine, 190.28 g/mol	105,148,190	<u>105,189,231,336</u>	18.35	1814
1-(2-Methoxyphenyl) Piperazine, 192.26 g/mol	120,134, <u>150,192</u>	134,162,191, <u>338</u>	18.58	1823
Butylone, 221.3 g/mol	70, <u>72,121,149</u>	121, <u>149,160,218</u>	18.84	1833
1-(3-Chlorophenyl) Piperazine, 196.5 g/mol	139, <u>154,156,196</u>	153,166,195, <u>342</u>	19.99	1878
1-(4-Methoxyphenyl) Piperazine, 192.26 g/mol	120,135, <u>150,192</u>	162,191,323, <u>338</u>	20.04	1880
Ketamine, 237.7 g/mol	<u>180,182,209</u>	<u>160,236,312,320</u>	20.13	1884
Cannabidiol, 314.46 g/mol	193, <u>231,246,299,314</u>	155,305, <u>375,460</u>	22.43	2081
Δ^9 -Tetrahydrocannabinol, 314.46 g/mol	258, <u>271,299,314</u>	389,417,445, <u>460</u>	22.74	2094
Methadone, 309.44 g/mol	<u>72,91,165</u>	<u>72,91,165</u>	22.85	2099
Cannabinol, 310.43 g/mol	165,223,238, <u>295,310</u>	209,238, <u>441</u>	23.25	2218
Amitriptyline, 277.4 g/mol	<u>58,91,115,202</u>	<u>58,91,115,202</u>	23.45	2227
Cocaine-d ₃ , 306.15 g/mol	85, <u>185,275,306</u>	85, <u>185,275,306</u>	23.53	2231
Cocaine, 303.35 g/mol	82, <u>182,272,303</u>	82, <u>182,272,303</u>	23.55	2232
11-Hydroxy- Δ^9 -Tetrahydrocannabinol, 344.45 g/mol	-	295,415,443, <u>458</u>	23.91	2249
Morphine-d ₃ , 288.36 g/mol	115,127,165, <u>288</u>	269,417, <u>580</u>	24.4	2271
Morphine, 285.34 g/mol	115,162, <u>285</u>	266,414, <u>577</u>	24.42	2272
Diazepam, 284.7 g/mol	<u>256,283,284,285</u>	<u>256,283,284,285</u>	26.21	2460
6-Acetylmorphine, 327.37 g/mol	215,268, <u>327</u>	204,361,414,473	27.06	2603
Heroin, 369.4 g/mol	268,310, <u>327,369</u>	268,310, <u>327,369</u>	28.29	2660

*RI calculated using Kovat's retention indices (Babushok, V.I., et al., 2007)

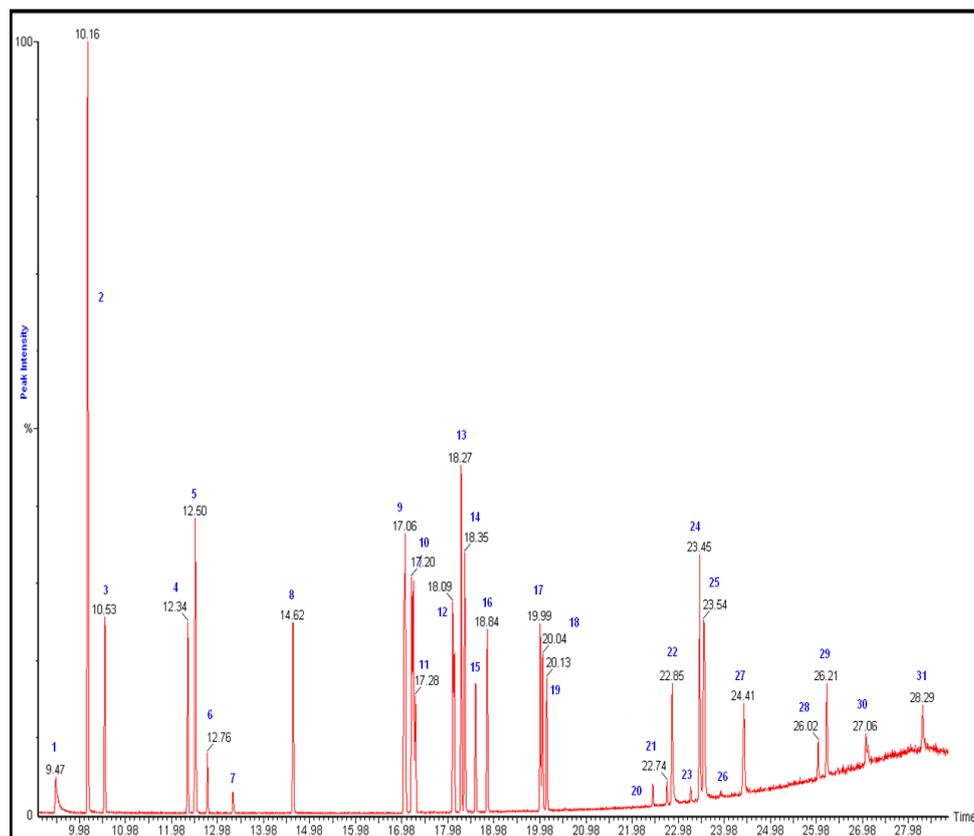


Figure 1: Total ion chromatogram of a derivatised mixed drug standard. (1)Quinoline, (2)Piperazine, (3)Amphetamine (4)Methamphetamine, (5)4-Fluoromethamphetamine, (6)3-Fluoromethcathinone, (7)Ecgonine methyl ester, (8)Mephedrone, (9) 1-Benzylpiperazine & 4-(Fluorophenyl)piperazine, (10) 1-(3-trifluoromethylphenyl) piperazine & 3,4-Methylenedioxymethamphetamine-*d*₅, (11)3,4-Methylenedioxymethamphetamine, (12)Methylbenzodioxolylbutanamine & 1-(4-trifluoromethylphenyl) piperazine, (13)1-(4-Methylphenyl)piperazine, (14) 1-methyl-4-benzylpiperazine, (15) 1-(2-methoxyphenyl) piperazine (16)Butylone, (17) 1-(3-chlorophenyl) piperazine, (18)1-(4-methoxyphenyl) piperazine, (19) Ketamine, (20)Cannabidiol, (21) Δ 9-tetrahydrocannabinol ,(22)Methadone,(23)Cannabinol, (24) Amitriptyline,(25) Cocaine & Cocaine-*d*₃,(26) 11-hydroxy- Δ 9- tetrahydrocannabinol , (27) Morphine & Morphine-*d*₃, (28)unknown (29)Diazepam, (30) 6-monoacetylmorphine (31) Heroin

3.2 Extraction methods (SPE & LLE)

Although a variety of SPE cartridges from various manufacturers have been used to extract drugs from waste water samples, the most popular have been Oasis MCX[®] and Oasis HLB[®] (Boles and Wells, 2010) and hence were adopted for this research project in addition to Oasis MAX[®].

As the aim of SPE is to isolate, concentrate and purify analytes from sample matrices, the different types of cartridges were tested to determine the most efficient in this regard for the target analytes. To determine the effect of sample pH on the recovery of the target analytes, some samples were acidified to pH 2.

Of the 3 cartridges tested on acidified and pH-unmodified samples, acidified samples on MCX[®] gave the best recoveries with regards to the number of drugs detected. HLB[®] gave the worst recoveries as a number of drugs could not be detected.

For LLE, the use of chloroform:isopropanol (3:1v/v) or chloroform:ethyl acetate:ethanol (3:1:1v/v) gave comparable recoveries overall and hence any of those solvent combinations could have been chosen. However, chloroform:ethyl acetate:ethanol had slightly better average recoveries (60%) for piperazines and beta-keto amphetamines compared with

chloroform:isopropanol (53%) and hence was selected for further analysis. Recoveries of the individual drugs are expected to vary due to their different physico-chemical properties such as stability, polarities, pH, and pK_a (Telepchak, et al., 2004). Practically all studies in this field have used SPE for sample cleanup (van Nuijs, et al, 2010) so there was no benchmark for comparison. However, LLE has been successfully used for extraction of drugs within forensic toxicology (Staack & Maurer, 2004; Tsutsumi et al, 2008).

The preliminary investigation was conducted with 2ml deionised water spiked with relatively high concentrations of drugs. Further work with higher volumes of deionised water (≥ 100 ml) and much lower concentrations of drugs will still need to be evaluated for both SPE and LLE before definitive conclusions can be made.

During method development, it is advisable to use a reference matrix with a similar composition to the material to be analysed in order to take into account possible interferences and complications (Lavagnini, et al., 2006). For this research, the extraction efficiency of SPE and LLE methods was tested first on deionised water. This was followed by a trial run to determine whether deuterated internal standards could be detected in spiked untreated waste water using the selected SPE and LLE methods.

The deuterated standards, 3,4-methylenedioxyamphetamine- d_5 (MDMA- d_5) and cocaine- d_3 , were detected in the samples extracted from spiked sewage (Figure 2). High concentrations at levels not normally found in waste water samples (0.05 – 0.25mg/ml) were added to minimize signal suppression by other compounds within the waste water. By using deuterated internal standards, the possibility of interference from non-target analytes and contribution from pre-existing drug levels was minimized.

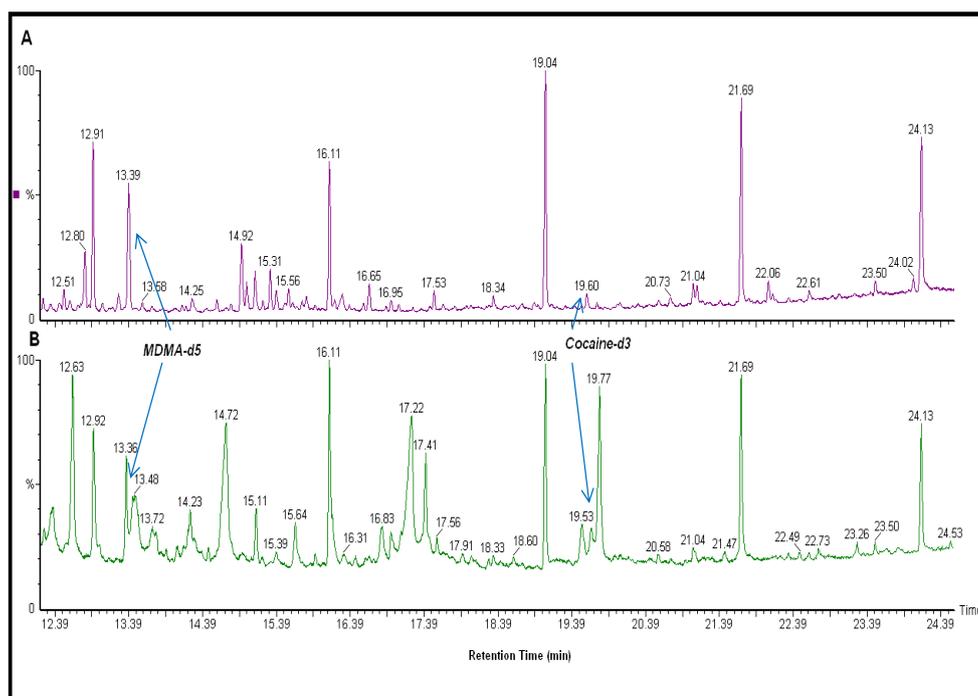


Figure 2: Total ion chromatograms of the LLE (A) and SPE (B) extracts from spiked untreated waste water.

3.3 Derivatisation

a) Derivatisation of positive controls

In order to determine whether derivatisation was necessary, positive controls of the drug standards were analysed individually and as a mixed standard at concentrations of 0.1mg/ml. This approach was adopted for both derivatised and underderivatised forms of the drugs. For illustrative purposes, Figure 3 compares the chromatogram and mass spectrum of underderivatised and PFPA-derivatised 4-fluoromethamphetamine. Improved peak shape and more abundant ions with a higher mass-to-charge ratio (m/z) are observed upon derivatisation. This trend was observed for all drug standards with some changes showing a greater improvement than others e.g. amphetamine and methamphetamine had greater improvements in peak shape, detection and more distinct mass spectral patterns. Some drugs such as morphine and 11-hydroxy- Δ^9 -tetrahydrocannabinol could not be detected in their underderivatised forms.

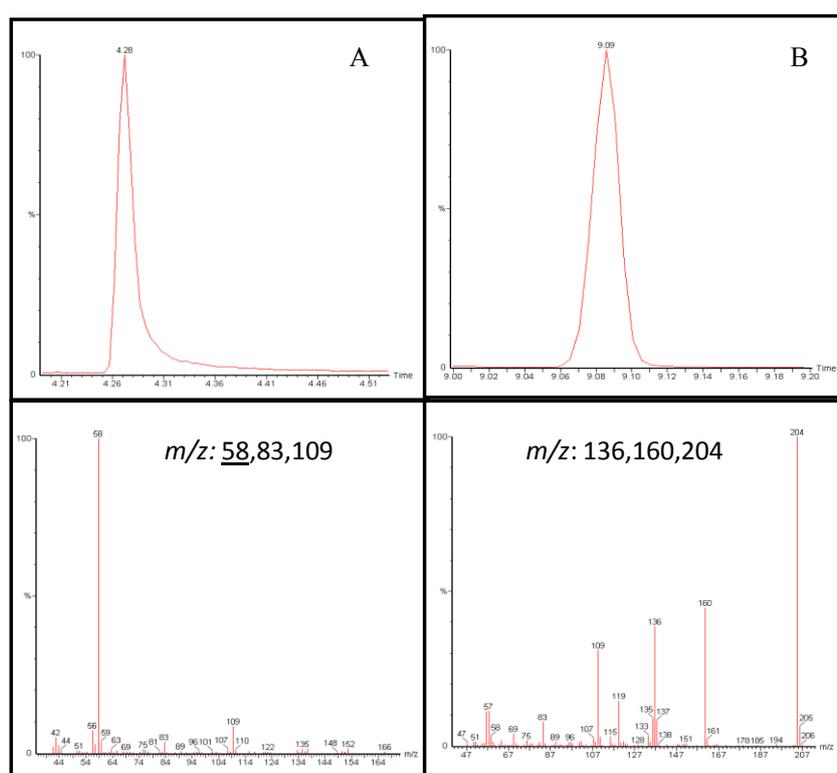


Figure 3: Underderivatised (A) and PFPA-derivatised (B) 4-Fluoromethamphetamine.

b) Selection of derivatising reagent

To establish which derivatisation agent would be most suitable for the target analytes, various reagents based on silylation, acylation and alkylation were investigated. These were selected based on their popularity in derivatising various types of drugs (Telepchak, et al., 2004; Blau and Halket, 1993). To determine which of the derivatising agents investigated (BSTFA, MSTFA, HFBA, acetic anhydride:pyridine (3:1v/v), PFPA:ethyl acetate (2:1v/v), TMPAH) was most suitable for the target analytes, various parameters were compared. Using the criteria of peak shape, derivatisation products and peak area, the acylating agents produced more reliable results than the silylation and alkylation reagents. Single peaks were obtained for each drug with the acylating reagents while silylation and alkylation chromatograms

showed several extra unknown peaks. Among the silylating agents, BSTFA had higher peak areas and completely derivatised compounds. However, the chromatogram had extra unknown peaks and hence was eliminated from selection. Among the acylation agents, PFPA gave the highest peak areas and mass spectra with higher atomic mass units. TMPAH gave the lowest peak areas and had extra peaks from unknown products as well as underivatised products. It was therefore decided to proceed with PFPA as the derivatising agent.

The majority of published studies in this field have used LC-MS/MS and therefore have had no need for derivatisation. The few that have used GC-MS have primarily used silylation (González-Mariño, et al., 2010; Sebok et al., 2009) and alkylation (Verenitech, et al., 2006) agents for derivatisation.

c) Optimization of derivatising reagent

As most derivatising agents require heat to be effective, the reaction time, temperature and volume of reagent used needed to be optimized for the target analytes. 0.1ml of PFPA:ethyl acetate (2:1v/v) was added to mixed drug standard (0.03mg/ml) and vortexed for a few seconds. Derivatisation was conducted at 70°C for 15, 25, 35 and 45 minutes. Evaporation of the derivatising agent was followed by reconstitution in 0.1ml methanol.

Mass spectra obtained from the derivatised individual and mixed drug standards were compared with published literature or the National Institute of Standards and Technology (NIST) mass spectral search program [Version 2.0(2)]. For those target analytes with no known pre-existing mass spectra for comparison, deductions were made based on the expected mass fragmentation pattern as determined from the molecular structure of the compound and molar mass. Comparisons were also made against mass spectra of the underivatised analogue and shift in retention time.

Based on the examination of peak area ratios (area of drug standard/area of internal standard) across the various time points, it would appear that the majority of drugs were fully derivatised at 15 minutes. There was no increase in peak area ratios at higher time points. However, for a few drugs, namely 6-acetylmorphine, morphine and cannabinal, derivatisation was incomplete at 45 minutes. Further comparison between the use of 0.1ml and 0.2ml PFPA:ethyl acetate (2:1v/v) at 70°C for 60 minutes showed no increase in peak areas for the target analytes with the exception of mephedrone. In addition 6-acetylmorphine, morphine and cannabinal still exhibited incomplete derivatisation even with a higher volume of derivatising agent and longer reaction time. Subsequently, derivatisation was performed with 0.1ml PFPA:ethyl acetate (2:1v/v) at 80°C for 45 minutes at which 6-acetylmorphine, morphine and cannabinal were completely derivatised. In their research, Gonzalez, et al. (2010) found that the volume of derivatising agent had the most impact on the completion of the silylation reaction. In this research, reaction temperature contributed the most to the completion of the acylation reaction.

Figure 1 depicts the total ion chromatogram of the PFPA-derivatised target analytes while the retention time (RT), retention index (RI) and diagnostic ions for the underivatised and PFPA-derivatised analytes are listed in Table 4. Some drugs such as 1-benzylpiperazine and 4-fluorophenylpiperazine co-elute but their diagnostic ions are sufficiently different to enable individual identification and future quantification. To improve the detection of the target analytes within a complex matrix such as untreated waste water, the use of selected ion monitoring (SIM) will be incorporated into the method development.

4. Stability Trials

A mixed drug standard was derivatised and reconstituted in methanol. A portion of this was used for a 14 hour autosampler stability study and another portion was used for storage stability studies at -20°C and 4°C over 6 weeks. Initial observed trends indicate that the amphetamine type stimulants and their analogues are stable under these conditions of testing. This follows a trend observed for silylated illicit drugs which were found to be stable for at least 1 week at -20°C (González-Mariño, et al., 2010).

In Figure 4, methylenedioxymethamphetamine (MDMA), methylbenzodioxolylbutanamine (MBDB), 1-(4-Trifluoromethylphenyl) piperazine (4-TFMPP) and 1-(4-Methoxyphenyl) piperazine (4-MPP) show stability over the 14 hour period. The peak area ratio for these analytes did not vary over time. On the other hand, ecgonine methyl ester, cannabinalol & Δ^9 -Tetrahydrocannabinol showed degradation over the 14 hour period evidenced by the reduction in height and peak area ratio of the respective peaks with time. However, further autosampler stability studies over a longer time period (24 hours) will be conducted for further evaluation. Full data is available on request.

In Figure 5, MDMA, MBDB, 4-TFMPP & 4-MPP show stability over a 6 week period at 5°C and -20°C as indicated by their PARs. The results from the stability studies indicate the importance of storing samples at temperatures between -20°C and 5°C . This has been collaborated by published studies which all utilize storage of positive controls or waste water samples at the above temperatures (Kasprzyk-Hordern, et al., 2007; Postigo, et al., 2011)

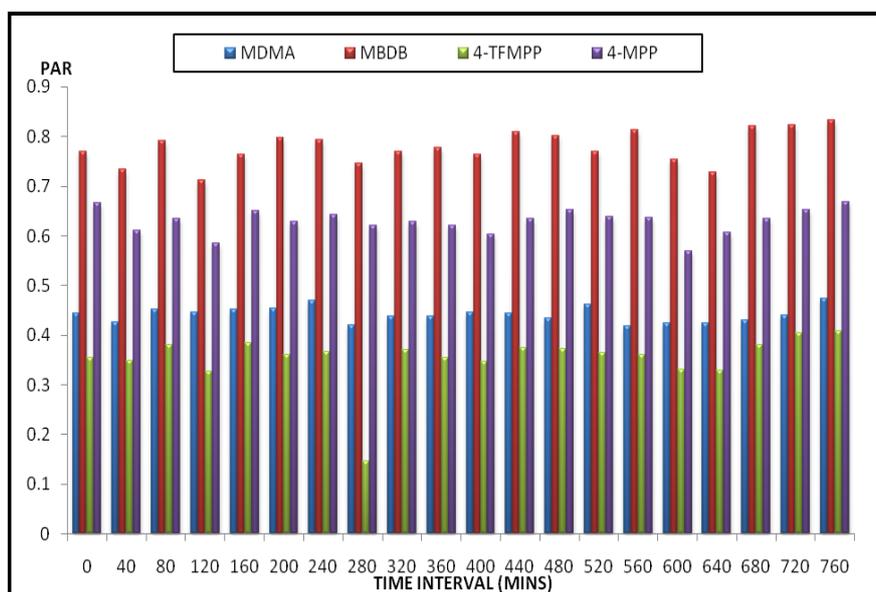


Figure 4: 14 hour autosampler stability of MDMA, MBDB, 4-TFMPP, and 4-MPP

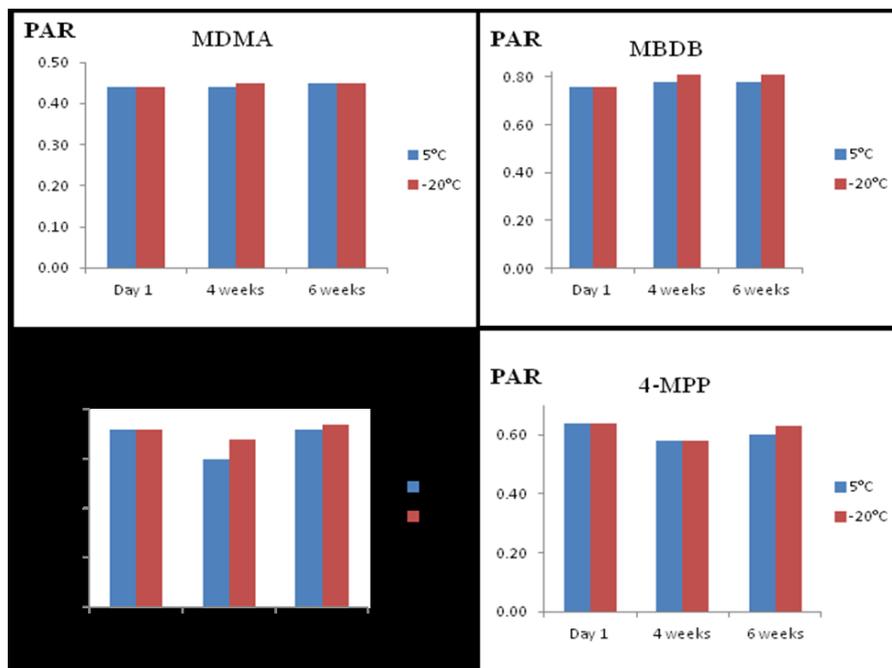


Figure 5: Storage stability of MDMA, MBDB, 4-TFMP, and 4-MPP at 5°C and -20°C.

5. Conclusion

From the preliminary investigations, a GC-MS method capable of simultaneously detecting 31 drugs from different classes in a mixed standard as well as from spiked water samples has been developed. This combination of target analytes with geographical location for sampling has not been investigated before. In addition, the use of LLE and GC-MS as analytical tools for the extraction and detection of the investigated illicit drugs in waste water samples has not been reported before.

For improved chromatographic and spectrometric parameters, acylation with PFPA:ethyl acetate was selected over silylation and alkylation. The combination of parameters such as peak shape, retention times, retention indices, and an increase in the number of diagnostic ions with a higher m/z indicate the method is suitable for simultaneous detection of the studied drugs of abuse. Although complete derivatisation was achieved at 80°C for 45 minutes, further optimization to reduce analysis time will need to be conducted.

LLE and SPE methods have been compared to evaluate suitability for the target drugs. For SPE, the method based on strong cationic exchange, Oasis MCX[®], has been selected for further optimization studies due to higher recoveries and detection of target analytes over other SPE cartridges. For LLE, the method based on chloroform:ethyl acetate:ethanol has been selected for further optimization studies. Initial indications show better recoveries, repeatability & speed of analysis with LLE over SPE. All internal standards spiked into untreated waste water were detected as a further indication of the suitability of the tested SPE and LLE methods.

Autosampler studies have shown certain drugs to be more stable than others over a 14 hour period. Amphetamine type stimulants such as MDMA, MBDB, 4-TFMP and 4-MPP, are more stable than drugs such as ecgonine methyl ester and Δ^9 -Tetrahydrocannabinol. Storage stability studies of the PFPA-derivatised mixed drug standard over a 6 week period have shown stability for the majority of drugs. Hence samples can be safely stored in derivatised form for upto 6 weeks before analysis. A point to note is that analysis after derivatisation is

normally done immediately after or within 1 week at the most. However, knowing that the derivatised drugs are stable for a much longer period is of an advantage due to the lack of breakdown products which can interfere with detection especially if the samples need to be re-analysed. There was little observable difference in the PARs between storage at 5°C and -20°C. Once extraction methods are optimized, stability of the mixed drug standards in untreated waste water will be evaluated to determine storage conditions of the unprocessed sample.

Further work towards method development will include optimization of derivatisation conditions, optimization of SPE and LLE methods using untreated waste water, optimization of instrumental parameters using SIM and splitless injection, and linearity. Upon validation, the analytical method will be applied to raw untreated waste water in order to determine the usage pattern of drugs within a particular community.

Acknowledgements

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Are Chorionic Arteries a Good Experimental Model to Study Myometrial Spiral Arteries Remodelling?

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Abstract

During pregnancy, spiral arteries and extracellular matrix (ECM) in the decidua and upper segments of the myometrium are remodelled. This vascular remodelling (VR) involves losing their vascular smooth muscle cells (VSMC) and their endothelium; and becoming wider, so the increased amount of blood flow can pass gently to the fetus. Uterine natural killer (uNK) cells were proved to play an important part in initiating VR by disrupting and breaking the VSMC and ECM. This study is done to investigate if uNK cells can have any effect on other arteries such as chorionic arteries so they can be proposed as a good experimental model to study VR as they are readily more accessible and easier to be isolated. Chorionic arteries taken from term placentas and myometrial arteries from non-pregnant pre-menopausal women were incubated for 72 hours with factors secreted by first trimester uNK cells. Immunoperoxidase and immunofluorescence staining of the arterial sections by using SMC marker (α -SMA), elastin, collagen-IV and laminin were done. Then, microscopy and image analysis were performed. The preliminary results showed that uNK medium can slightly affect the vascular wall of chorionic arteries in contrast with the severe disorganization it can cause in the myometrial spiral arteries wall. This suggested that uNK medium can not affect chorionic arteries.

Keywords:

Chorionic, myometrial, remodelling and spiral.

1. Introduction

In pregnancy, vascular remodelling (VR) of spiral arteries and extracellular matrix (ECM) in the decidua and upper segments of the myometrium happens. It involves disappearing in their vascular smooth muscle cells (VSMC) and their endothelium; and becoming wider [(Harris, 1966), (Pijnenborg, 2006) and (Pijnenborg, 1998)]. In some pregnancy complications such as intrauterine growth restriction (IUGR) and pre-eclampsia the vascular remodelling is incomplete (Moffett, 2006) (Fig.1). We believe the understanding the mechanism of that will help us to find prevention or cure from these life-threatening illnesses. Uterine natural killer (uNK) cells were suggested to play an important part in initiating VR by disrupting and breaking the VSMC and ECM [(Smith, 2009) and (Harris, 2010)]. This study is done to investigate if uNK cells can have any effect on other arteries such as the chorionic arteries so they can be proposed as a good experimental model to study vascular remodelling as they are more available and easier to be isolated than the spiral arteries.

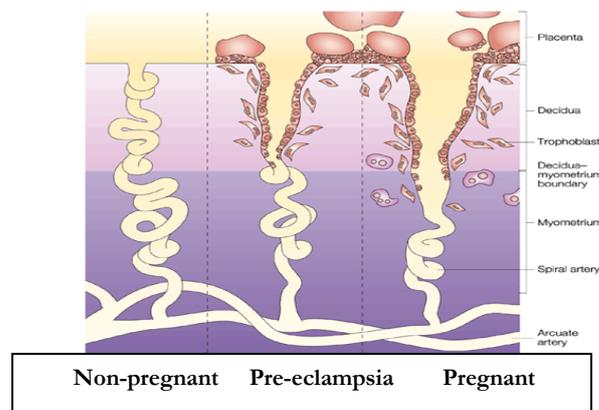


Fig. 1: Vascular remodelling in normal and complicated pregnancies. The remodelling is restricted to the decidua and incomplete in pre-eclampsia. (Moffett, 2006)

2. Methods

Chorionic arteries taken from term placentas and myometrial arteries from non-pregnant pre-menopausal women were incubated for 72 hours with factors secreted by first trimester uNK cells. Immunoperoxidase and immunofluorescence staining of the arterial sections by using SMC marker (α -SMA), elastin, collagen-IV and laminin were performed. Then, microscopy and image analysis were made.

2.1. *Tissue collection and ethical approval*

Normal term placenta (n=2), first trimester decidua (n=3) obtained at pregnancy termination, myometrium (n=3) obtained from non-pregnant, pre-menopausal women undergoing hysterectomy (for medical or social reasons) were collected with North West Research Ethics Committee approval (term placenta: 08/H1010/55, first trimester decidua: 08/H1010/28, non-pregnant myometrium: 08/H1011/71) and written informed consent. Tissue was transported in sterile phosphate buffered saline (PBS) and used within 30 min of collection.

2.2. *uNK cell isolation and culture: method development*

uNK cells were isolated at Newcastle University at the beginning of the project (Vassiliadou, 1998), and later we tried to establish a similar protocol in the University of Manchester. Briefly, decidual tissue was digested with collagenase (1 ml), DNAase I (0.1 mg/ml) and BSA (1 mg/ml). Immunomagnetic beads were used to isolate the uNK cells which were cultured for 48 h in RPMI 1640 with 10% fetal bovine serum (Vassiliadou, 1998) (Sigma, UK). To isolate uNK cell conditioned medium, cells were cultured for 24 h; medium was collected, centrifuged at 1500 rpm for 5 min to remove cell debris and stored at -20°C until future use. preparing uNK cells at Newcastle University generated cells which are 80-90% viable (by trypan blue exclusion) after 48 hours culture (Lash, 2010). We modified the published protocol, adding ammonium chloride to lyse the significant numbers of contaminating erythrocytes, exposing only 10^7 cells to the magnetic beads rather than using the whole cells, and leaving the cells to adhere for only 1 hour rather than overnight. Both of the uNK cells (either prepared in Manchester or in Newcastle) were used in the experiments and gave the same results as showing later on the section of the results.

2.3. *Isolating chorionic plate arteries and exposing them to the uNK cells*

Chorionic plate arteries from term placentas (n=2) were dissected and cultured with uNK cells for 72 hours.

2.4. *Myometrial spiral artery culture and exposing them to the uNK cells*

Spiral arteries were dissected from myometrial biopsies (n=3) under sterile conditions and cultured in a 1:1 ratio of DMEM/Ham's F12 containing 10% fetal bovine serum at 37 °C and in 5% CO₂/95% air. Following dissection, some arteries were cultured with control medium (20% (v/v); CA), the rest of the arteries were cultured with uNK cell -conditioned medium (20% (v/v); UA). After 72 h, the arteries were placed in a frozen embedding matrix (OCT) (Raymond A Lamb/UK) and stored at -20° C. Arterial sections (10µm) were prepared using LEICA CM3050 cryostat, mounted on coated slides (Thermo/CA) and stored at -80°C.

2.5. *Fluorescent staining of frozen sections*

Tissue sections were removed from the freezer (- 80°C) and left for 15 min at room temperature to warm up. Then, the sections were fixed with paraformaldehyde (4% (v/v) in PBS) for 15 min and washed with PBS. For permeabilisation Triton-X solution (0.1% in PBS) was applied for 10 min. After washing the sections, 30 µl of primary antibody diluted in PBS was added to each tissue section for one hour. After three 5 min PBS washes, 30 µl of diluted secondary antibody was added and the slides incubated in a dark place for one hour in room temperature. Three 5 min washes with PBS were done then sections were mounted with vectashield mounting medium containing propidium iodide (Vector/CA).

2.6. *Immunohistochemistry of frozen tissue sections*

Frozen sections were warmed up to room temperature, fixed and permeabilised as described in the fluorescent staining protocol. Before blocking non-specific binding sites with 5% BSA, slides were incubated with 3% hydrogen peroxide for 10 min to quench endogenous peroxidase activity. Primary antibodies diluted to the required concentrations with TBS, were added to the tissue sections and stored overnight at 4° C. On the following day, the sections were washed with TBS for 3 X 5 min; the secondary antibodies were applied and left for 30 min at room temperature. Following 3X5 min washes in TBS; avidin-peroxidase was used at a concentration of 1:200 in TBS and left for 30 min at room temperature. After more TBS washes (3X5 min) the tissue sections were stained and mounted.

2.7. *Microscopy and image analysis*

2.7.1. *Immunohistochemistry images*

A Q Imaging Qicam FAST 1394 camera connected to a Leitz Dialux 22 microscope was used to take images of the tissue sections and digital image capture: Image-Pro Plus 6.0 programme was used for the image analysis.

2.7.2. Immunofluorescence images

A Q Imaging FAST 1394 camera linked to Olympus 1X70 microscope was used to capture the images of the tissue sections and digital image capture: Q Capture Pro 6.0 software was used for image analysis.

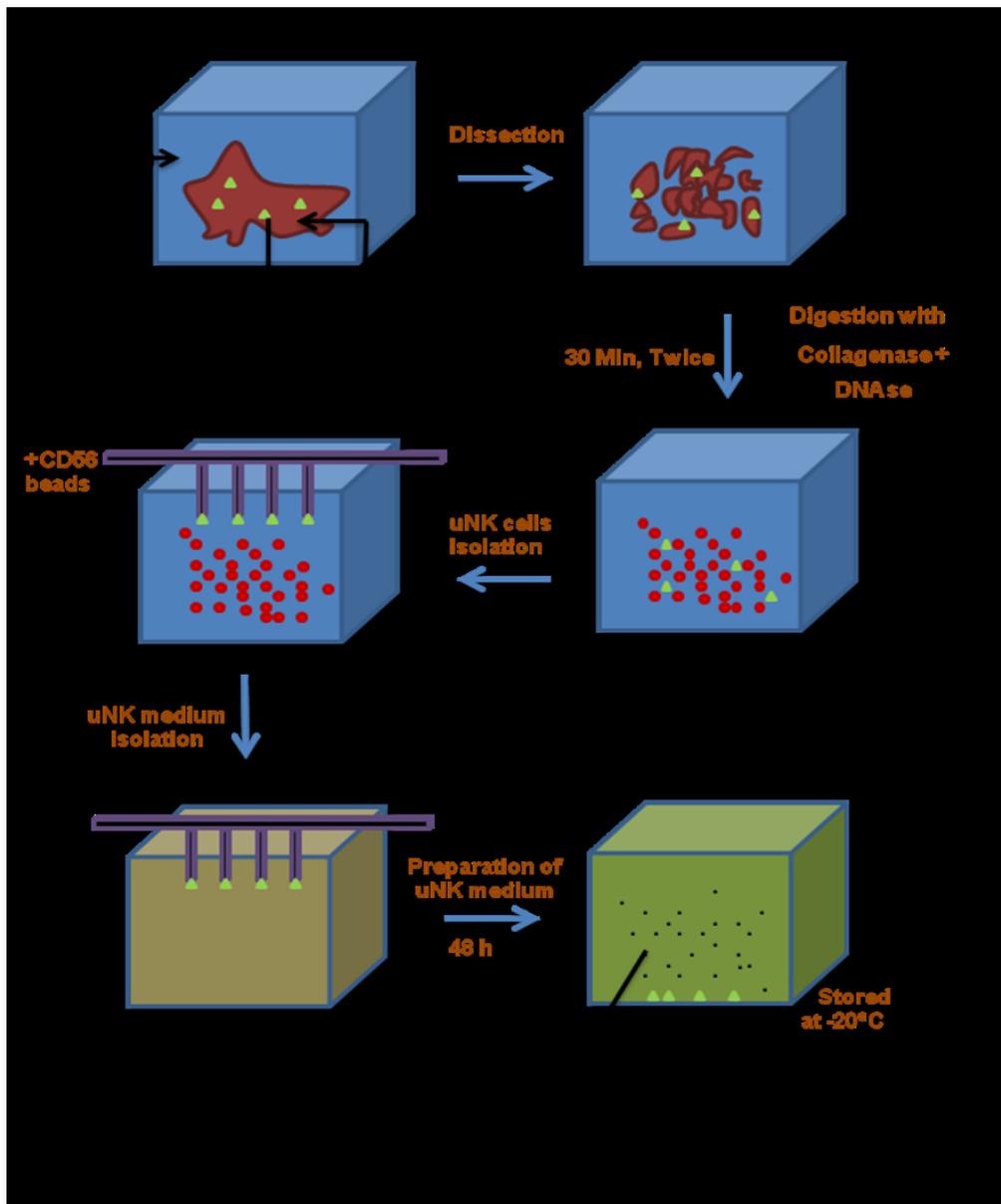


Fig. 2: Isolation of uNK cells and preparation of uNK medium. A and B: Decidual tissue was minced into fine pieces about 1 mm³ under sterile conditions in RPMI 1640 medium containing 100 U/ml penicillin, 1 mg/ml streptomycin and 2 mM L-glutamine (Sigma, UK). C: tissue was digested twice for 30 min with 1 mg/ml type II collagenase and 0.1 mg/ml DNase. D: The resulting uNK cells were selected using immunomagnetic beads coated with anti-CD56 antibodies. E: uNK cells were transferred to fresh RPMI 1640 with 10% fetal bovine serum cultured for 48 h at 37°C in 5% co₂. F: The cell-free conditioned medium which contains secreted substances from the uNK cells was centrifuged to remove contaminating cells and stored at -20°C until use.

3. Results

Secreted substances from uNK cells (uNK medium) had little effect on the vascular wall of chorionic arteries (Fig. 3) in contrast with the severe disorganization it caused in the myometrial spiral arteries wall (Fig. 4).

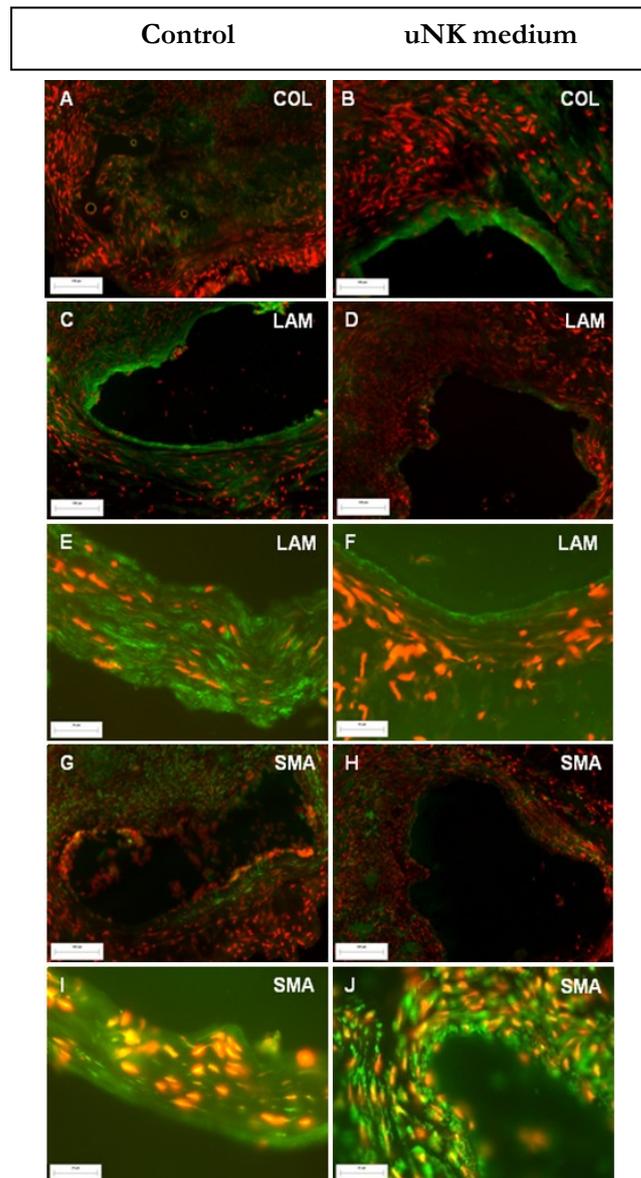


Fig. 3: chorionic arteries were exposed to the uNK medium for 72 h showed no important changes in the vascular wall after staining the tissue sections for collagen IV (COL), laminin (LAM) and α -smooth muscle actin (α -SMA). Scale bars: A-D, G and H: 100 μ m. E, F, I and J: 25 μ m.

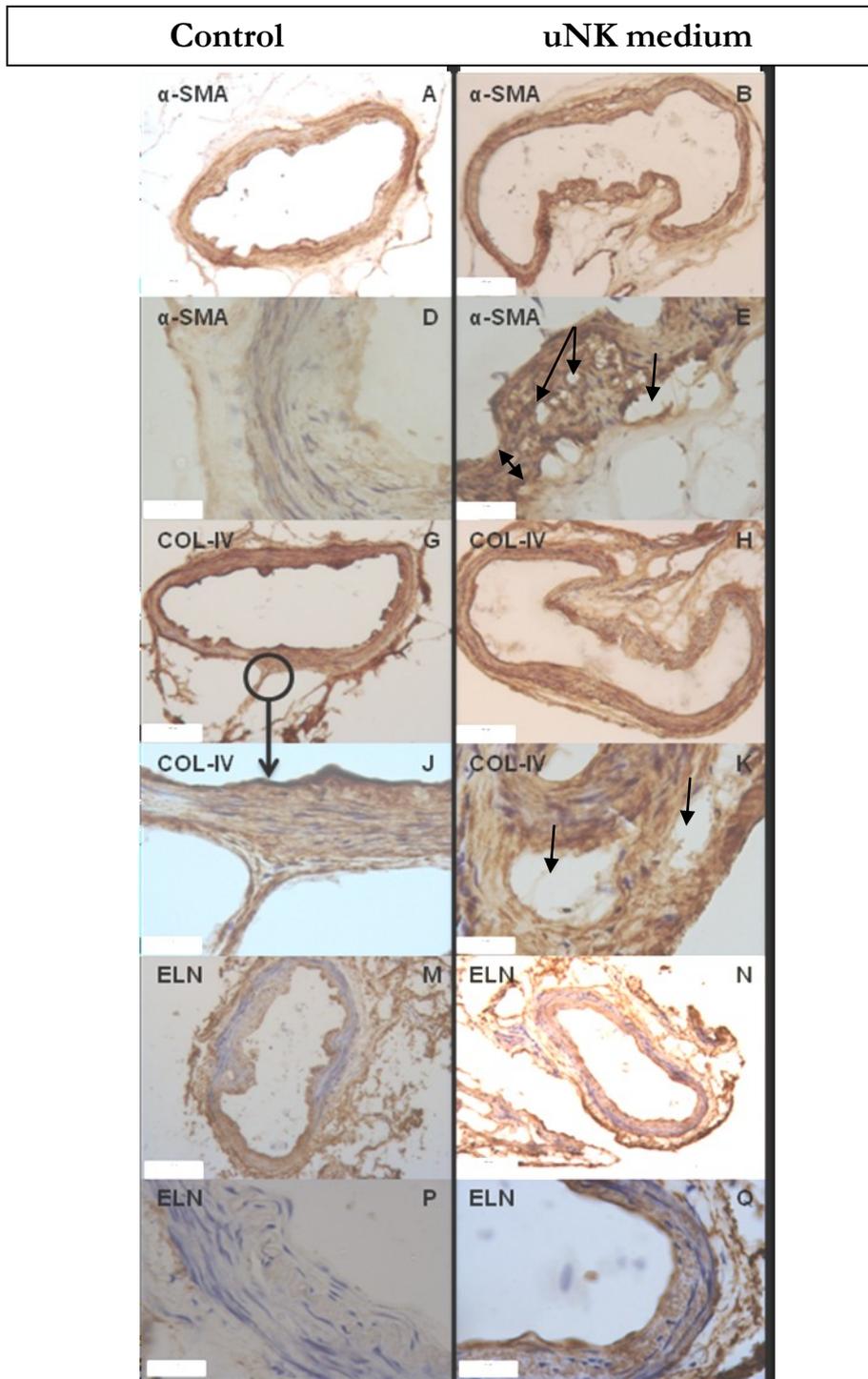


Fig. 4: myometrial arteries were exposed to the uNK medium for 72 h showed disorganization and breaks in the vascular wall after staining the tissue sections for collagen IV (COL), laminin (LAM) and α -smooth muscle actin (α -SMA). Arrows are showing the breaks and the double arrows are showing the decrease in the thickness of the vascular wall. Scale bars: A, B, G, H, M and N: 100 μ m. D, E, J, K, P and Q: 25 μ m.

4. Discussion

Our preliminary findings suggest that uNK medium can not affect chorionic arteries. The reason of that might be the difference in the structure of chorionic arteries and myometrial arteries. In the former the smooth muscle cells are disorganized while they are organized in the later (Sweeney, 2006). However, using smaller chorionic arteries, as small as myometrial

arteries, is needed and trying other arteries such as omental arteries is a second option. These omental arteries can be obtained during an open abdominal surgery.

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Towards the Simulation of Ramp Weaving Sections

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Abstract

Motorway weaving sections entail intensive lane changes which lead to high turbulence within such sections. Different methods, such as mathematical modelling, have been adopted to analyse traffic behaviour and to determine weaving section capacity. However, simulation methods have proved to be more effective than other mathematical methods. Therefore, a simulation model has been developed for this purpose and this model has been calibrated and validated with field data from normal and weaving sites. Different configurations of weaving sections are in use, such as “major weave” which occurs between two major roads and “ramp weave” that occurs between minor road (i.e. on-ramp) and major road (i.e. motorway). This study focuses on ramp weave only since the data available from sites represent this configuration. Field data was used to calibrate and validate the newly developed simulation model. The results from the newly developed model showed good fit with the field data in terms of calibration and validation. The model has been applied to assess the effect of weaving length under different number of lanes for ramp weave sections, the percentage of heavy goods vehicle and the different volume ratios. The results showed that weaving length has an effect on capacity up to a certain limit, after which its effect dissipates. The presence of heavy goods vehicles also causes a high reduction in the capacity of the weaving section and this reduction has been estimated. Other factors, such as volume ratio, have a significant effect on the capacity of weaving section.

Keywords weaving section capacity, ramp weave, HGVs effect

1. Introduction

More attentions have been directed towards microscopic simulation models in the last two decades because of several merits of using this approach. These are ability of simulation to provide visual environment and managing many problems, such as congestion and signal control optimisation, which cannot be solved by traditional tools because of the complexity of the road transport system. In addition, these microscopic models help more in applying different scenarios without disrupting the traffic and using expensive sources (Hidas, 2005). Paramics, AIMSUN and VISSIM are examples of well-known micro-simulation models used in practice.

The existing simulation models suffer from several limitations especially when trying to represent weaving areas. For example, the AIMSUN model allows vehicles to go in the wrong direction if it could not find a suitable gap to change lanes after a maximum time called “lost vehicle” which indicates a failure in the model (Hidas, 2005). Prevedouros and Wang (1999) reported that the INTEGRATION model has several limitations such as waiting at the divergence point and making long queue which do not occur in reality. Questionable capacity and gap acceptance have been reported in the CORSIM simulation model for weaving sections (Zhang and Rakha, 2005). Moreover, under heavy flow, VISSIM is unable to model weaving sections (Gomes *et al.*, 2004). Similarly, AIMSUN, CORSIM and

Paramics also have the same problem under heavy flow in the weaving area as reported by Sarvi *et al.* (2011).

To overcome these limitations which affect the accuracy of estimating the weaving capacity using existing simulation models, there is a need for developing a new simulation model. Therefore, this study is devoted to the development of a simulation model to evaluate the capacity of weaving section and to applying different scenarios to improve weaving section performance.

2. Weaving section

Weaving can be defined as the crossing of two or more traffic streams while travelling in the same general direction along a specific section of a highway without the aid of traffic control devices such as traffic signals and traffic signs (HCM 2000). The HCM classifies weaving into three types, namely: Types A, B and C. This classification is based on the minimum number of lane changes that are expected by weaving vehicles.

A few studies were found in the literatures that relate to this study. For example, Zarean and Nemeth (1988) adopted the WEAVSIM microscopic simulation model to investigate the effect of the different arrival speeds on the operation of weaving sections. Subsequently, the researchers suggested a regression model for the modelling of weaving sections based on the results from simulation. However, this model does not include the cooperative behaviour in its algorithm which is predominately observed in weaving sections.

Cassidy and May (1991) compared the speed of weaving and non-weaving vehicles results from six procedures; the 1985 HCM, Leisch method (Leisch, 1979), JHK method (Leisch, 1984), Fazio method and Polytechnic Institute of New York (PINY) (Pignataro *et al.*, 1975, Zhang, 2005), with field data. The results show that no one of these procedures was adequate because the speed was insensitive to flow. In addition, the HCM (2000) has proved to be inaccurate because it estimates weaving capacity based on the assumption that density at capacity is equivalent to 27pcphpl without giving reasons behind the selection of this value. This was reflected by other studies using simulation models such as Skabardonis *et al.* (1989), Zhang (2005) and Lee and Cassidy (2009).

These simulation models mainly depend on field data to represent the behaviour of drivers through the calibration and validation processes. Moreover, most weaving data suffer from either limited samples or incomprehensive data (Lee and Cassidy, 2009).

Here in the UK, there is an obvious lack of field data for weaving sections. Developing a simulation model for a specific case depending on data from other environmental conditions or different rules and systems of driving may lead to inaccurate results. Therefore, in this study and in order to overcome these problems, seven weaving sections were adopted and used in the calibration and validation processes of the simulation model which was developed to study such sections.

3. Developed model

The developed model consists of sub-models such as car-following, gap acceptance, lane changing and weaving processes. The algorithms of these processes were programmed using Visual Compact Fortran as bed test.

3.1 Car –following rules

The developed car following model governs the longitudinal movement of vehicles in a lane by selecting a suitable acceleration/deceleration (Al-Jameel, 2009). If a driver has no obstruction, s/he will drive to reach the desired speed or choose the maximum deceleration in the case of an emergency when her/his leader suddenly stops. In addition, a driver will use her/his normal acceleration/deceleration when s/he exceeds the desired speed or speed limit. These different accelerations have been included in this model.

The selection of a suitable car-following model is a crucial task in developing a simulation model. Therefore, different car-following models were developed and tested. These models were GHR, CARSIM, WEAVSIM and Paramics (Al-Jameel, 2009 and 2010). The assumptions of the GHR, CARSIM and WEAVSIM were developed using Visual Compact Fortran as the test-bed. Then, these models were tested under different sets of data including different traffic conditions. The results of these tests showed that CARSIM was the most reasonable model in replicating reality amongst others in representing different traffic conditions (Al-Jameel, 2009 and 2010). Therefore, most of the CARSIM assumptions were adopted to develop this car-following model. Accordingly, a new car-following model was developed to represent the weaving section. High interactions and stop and go conditions need considerable attention to be correctly represented. This was done by selecting suitable limits of reaction time, buffer spacing, start-up delay and other characteristics in order to test this model with field data as discussed below.

The model was compared with field data reported by Panwia and Dia (2005) as shown in Figure 1. Root mean square error (RMSE) and error metric (EM) have been used as good indication to test the accuracy of the developed model (Panwia and Dia, 2005). The results show that the developed model gave the lowest error than other models which have been compared under the same set of data as indicated in Table 1.

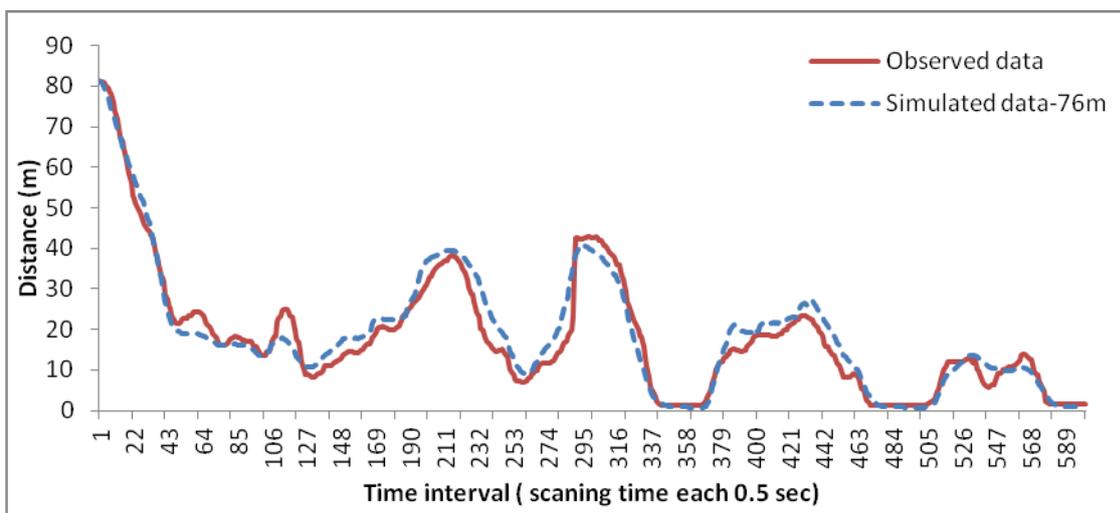


Fig.1. Calibration of simulation with observation data using different effective distances

Table 1 Performance of car-following rule for selected simulation models (Panwai and Dia, 2005).

<i>Simulator</i>	<i>The developed model</i>	<i>AIMSUN (4.15)</i>	<i>VISSIM (v3.70)</i>		<i>Paramics (v4.1)</i>
			<i>Wiedemann74</i>	<i>Wiedemann99</i>	
<i>EM</i>	<i>2.01</i>	<i>2.55</i>	<i>4.78</i>	<i>4.50</i>	<i>4.68</i>
<i>RMSE</i>	<i>3.49</i>	<i>4.99</i>	<i>5.72</i>	<i>5.05</i>	<i>10.43</i>

3.2 Lane changing rules

Lane changing represents transferring vehicle from the subject lane to an adjacent lane under different conditions. Two types of lane changing have been adopted in this study, namely discretionary and mandatory. The discretionary lane changes are implemented when a driver has a desire to increase her/his speed or to avoid being locked behind slower vehicles (Sultan and McDonald, 2001). Whereas, mandatory lane changes are achieved in order to reach the destination, i.e. a driver has to change lanes to be in the right direction such as weaving process.

The field data collected by Yousif (1993) and Sparman (1979) were used for the purpose of comparison with the simulated data for two lane normal sections as shown in Figure 2. The results demonstrate that the trend from simulation approximately matches reality in terms of frequency of lane changes (FLC). This behaviour can be represented by an increase in the FLC with an increase in flow up to 2000 veh/hr followed by a decrease in FLC as shown in the Figure. The main factors that have been adjusted during this calibration process are the gap acceptance parameters ($\beta_1=0.5$, $\beta_2=0.6$, $\beta_3=0.5$, $\beta_4=0.8$) as used in the following equations for lead and lag parts of the gap. Note that for both equations, the first term (i.e. LD and LG) should be equal or more than zero.

$$LD = \beta_1 \left[\frac{VL^2}{MPL} - \frac{VC^2}{MC} \right] + \beta_2 * RT * VC \quad (1)$$

$$LG = \beta_3 \left[\frac{VC^2}{MC} - \frac{VF^2}{MF} \right] + \beta_4 * RT * VF \quad (2)$$

Where;

LD is the minimum lead gap (m).

LG is the minimum lag gap (m).

β_1 , β_2 , β_3 & β_4 are calibration parameters.

VL is the speed of leading vehicle (m/sec).

VC is speed of lane changing vehicle (m/sec).

VF is speed of following vehicle (m/sec).

MPL is the maximum deceleration of the leading vehicle in the target lane ($\frac{m}{sec^2}$).

MC is the maximum deceleration of the lane changing vehicle ($\frac{m}{sec^2}$).

MF is the maximum deceleration of the following vehicle ($\frac{m}{sec^2}$).

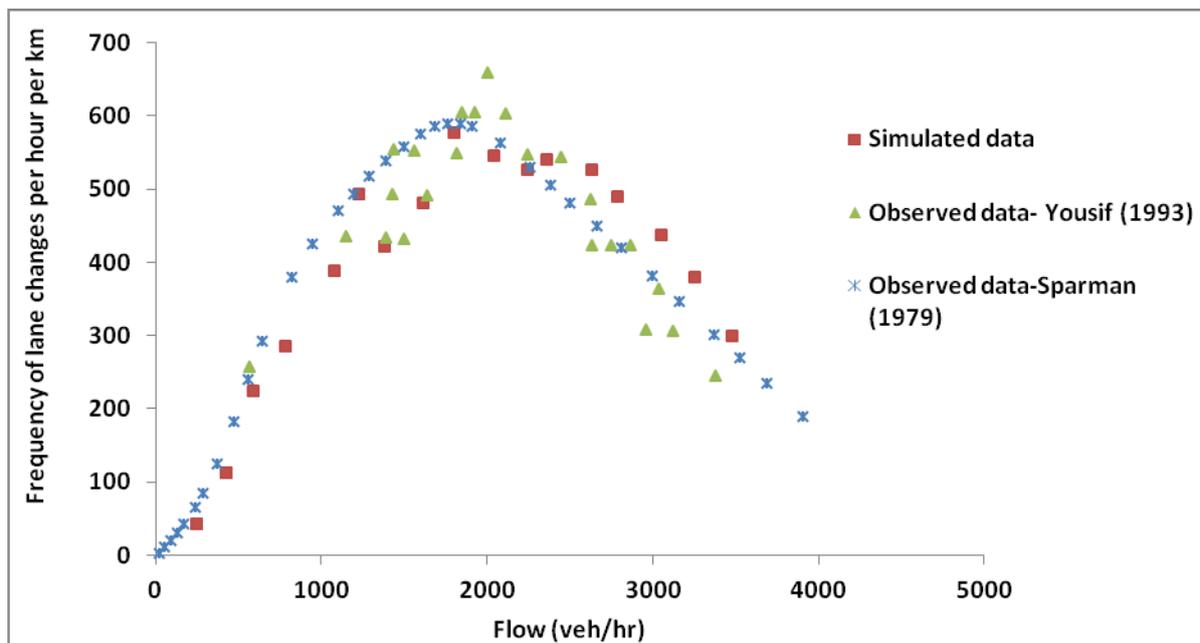


Fig.2. Frequency of lane changes from simulation compared with different sets of observed data for two-lane normal sections

4. Weaving rules

The main processes of weaving section can be summarised by the interaction between traffic streams coming from the on-ramp with that coming from the motorway. For normal motorway sections, the interaction includes the cooperative behaviour (i.e. shifting to adjacent lanes or staying in the same lane but with applying deceleration). For the case of sections with on-ramps, the same behaviour applies but without shifting to adjacent lane (in the case of one auxiliary lane).

Close following behaviour, which represents accepting small spacing between the changing vehicle and its leader as reported by Wang (2006), was also applied. After the close following behaviour, the changing vehicle returns to the normal case (i.e. the spacing gap increases to be as in the normal case). This process is called relaxation behaviour (Laval and Leclercq, 2008 and Cohen, 2004). In this study, the duration of close following behaviour for weaving vehicles, was adopted as 20 sec (Cohen, 2004).

4.1 Weaving behaviour

The weaving process consists of several complicated processes to reach the destination such as reducing and increasing the speed of vehicles involved in the weaving process among merging and diverging vehicles as shown in Figure 3. Based on real data from weaving sections as investigated by this study, it was found that the percentage of courtesy yielding exceeds 90%. On the other hand, the cooperative lane changing has been assumed for non-weaving vehicles when their decelerations are less or equal to -3 m/sec^2 . This value has been identified as the maximum deceleration value which could be applied to drivers under normal conditions as reported by (ITE, 2010).

Al-Jameel (2011) introduced the effective length which is the length at which most weaving vehicles completed their manoeuvres. This length is influenced by the geometric design such as weaving type and weaving length. According to Al-Jameel (2011), the effective length was about 200m for ramp weaving sections when the weaving length was more than 300m, whereas this length represented the whole of the weaving length for sections with lengths less than 150m for the same type. In this study, the effective length used instead of total weaving length to make a driver accepting high risk in terms of maximum deceleration. Other characteristics were also investigated such as volume ratio (VR) and weaving ratio (R).

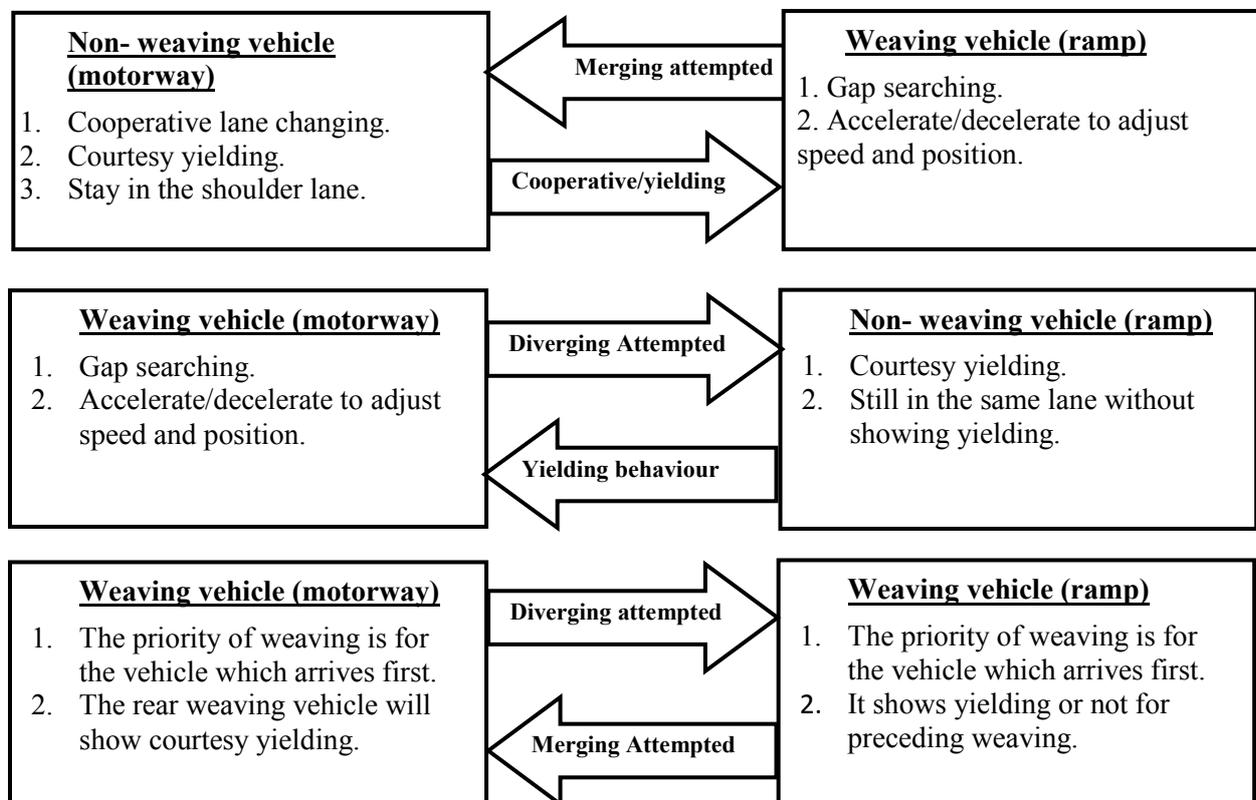


Fig.3. Interaction behaviours for weaving vehicles (motorway and ramp)

4.2 Testing the developed model with field data

The developed model was tested with field data collected from video recordings and data from the Motorway Incident Detection and Automatic Signalling (MIDAS). Figure 4

indicates the location of loop detectors at the weaving section on the M60 J2. The upstream loop detector was used as input for the simulation model and other loops were used for comparison with field data.

The type of this weaving section is Type A (ramp weave) with four lanes (i.e. the motorway consists of three lanes and one lane for the on-ramp). The length of the section is 400m with four lane weaving section. This set represented 130 minutes of data for both speed and flow and was used to calibrate the developed model.

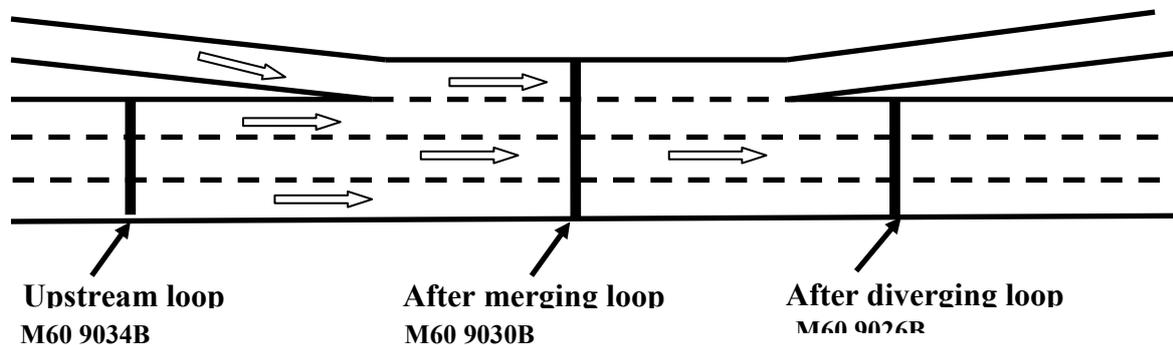
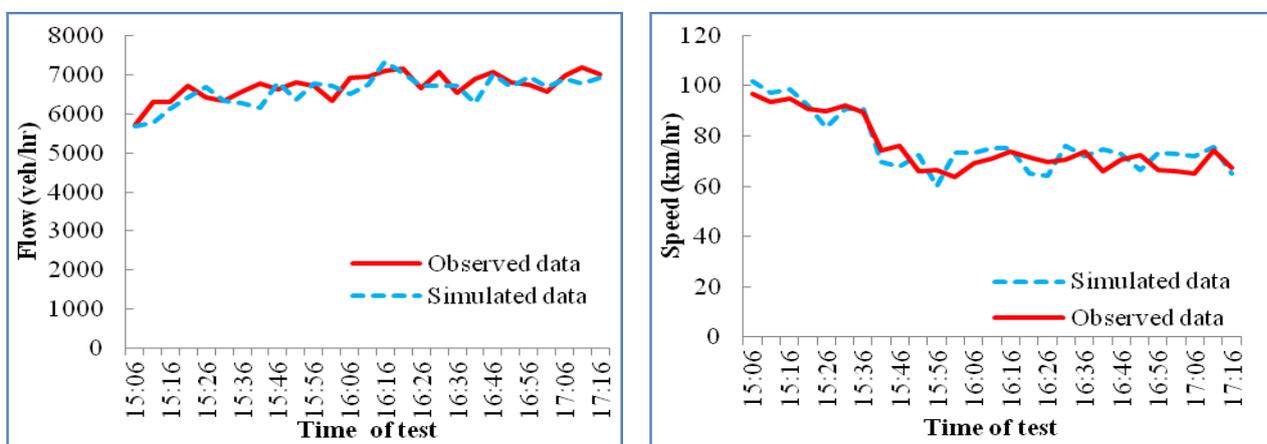


Fig.4. Data collected from different loop detectors for the M60 J2 weaving section.

For this weaving section, there are three loop detectors, as follows:

- the upstream detector (M609034B) at 200m from the entrance point,
- the merging detector (M609030B) at 200m after the entrance point, and
- the diverging detector (M609026B) at 90m after the exit point.

To select the optimum parameters for Equations 1 and 2, it was found that ($\beta_3=0.3$ and $\beta_4=0.4$). Fig.5 shows the comparison between observed and simulated data, whereas Table 3 demonstrates the statistical tests for this comparison. The tests used here are the coefficient of correlation (r), root mean square percent (RMSP), Theil's inequality coefficient (U), Theil's mean difference (U_m) and Theil's standard deviation (U_s). These tests have been used in different traffic simulation models, for example, Hourdakis *et al.* (2003) and Wang (2006). The results of the comparison show that these values are within acceptable limits. Therefore, the developed model reasonable represents the reality as shown in Table 3.



A. Observed and simulated flow (veh/hr)

B. Observed and simulated speed (km/hr)

Fig.5. Comparison between field and simulated data: (A) Flow and (B) Speed.

Another set of field data from the M60 - J2 was used to validate the developed model as indicated in Table 4. The results also show good agreement with field data since they are within acceptable limits.

Table 3 Comparison between simulated and observed data-M60-J2 on 29-10-2010

<i>Loop location</i>	<i>After merging section</i>		<i>After diverging section</i>	
<i>Parameters</i>	<i>Flow</i>	<i>speed</i>	<i>Flow</i>	<i>Speed</i>
<i>R</i>	0.88	0.91	0.88	0.83
<i>U</i>	0.017	0.034	0.0169	0.034
<i>Um</i>	0.276	0.039	0.299	0.409
<i>Us</i>	0.029	0.0081	0.0463	0.09
<i>RMSP%</i>	3.5	1.51	3.6	7.0

Table 4 Comparison between simulated and field data from the M60–J2 on 8-10-2010

<i>Location</i>	<i>After merging section</i>		<i>After diverging section</i>	
<i>Parameters</i>	<i>Flow</i>	<i>Speed</i>	<i>Flow</i>	<i>Speed</i>
<i>RMSP%</i>	4.9	0.11	2.6	1.7
<i>R</i>	0.93	0.89	0.975	0.90
<i>U</i>	0.029	0.046	0.048	0.038
<i>Um</i>	0.086	0.007	0.826	0.009
<i>Us</i>	0.0116	0.0045	0.006	0.193

5. The applications of the developed model

After the calibration and validation processes which show reasonable results, the developed model was used to investigate different impacts of some characteristics such as the percentage of heavy goods vehicles (HGVs), the volume ratio (VR) and the length of weaving section.

5.1 Impact of HGVs

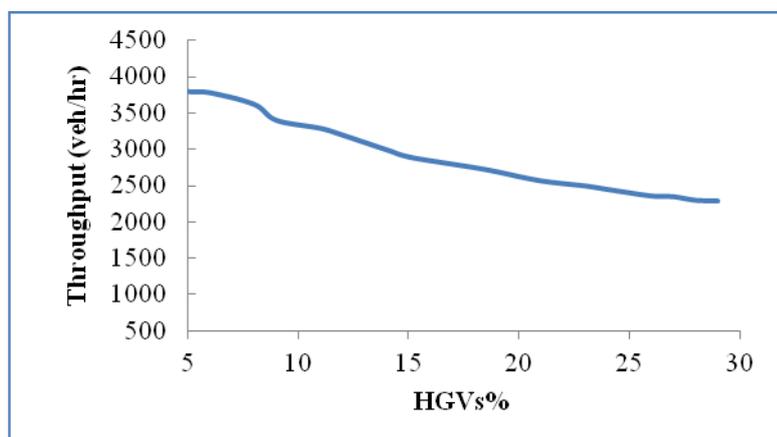
The effect of HGVs was investigated using the developed model. In order to test the effect of varying the percentages of HGVs, other parameters were fixed in the model. These

parameters include the length of weaving section (300m), the VR (0.25), R (0.4). Three types of weaving sections were used in this test: two-lane, three-lane and four-lane sections.

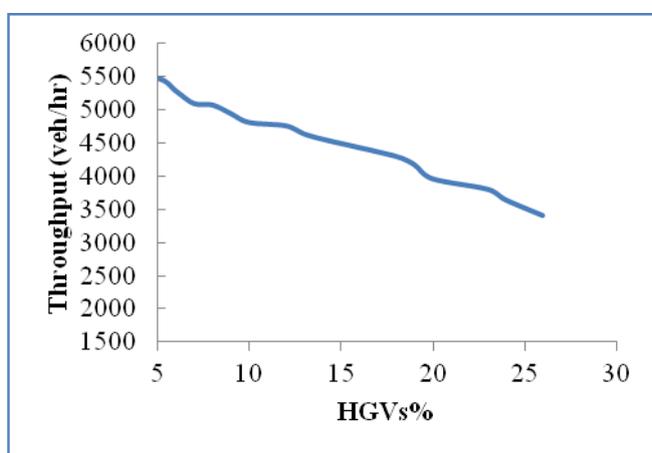
Figure 6-a shows the effect of different percentages of HGVs on the throughput for a two-lane weaving section. As the percentage of HGVs increases, the throughput decreases from approximately 3800 veh/hr to less than 2300 veh/hr.

For a three-lane weaving section, the effect of the percentage of the HGVs has also been investigated as shown in Figure 6-b. As the percentage of the HGVs increases, the throughput decreases from approximately 5500 veh/hr to 3400 veh/hr. This reduction in the throughput is higher than that for the two-lane weaving section. On other hand, the effect of the HGVs for the weaving section with four lanes has also been investigated as shown in Figure 6-c. The reduction in the throughput reaches up to 2200 veh/hr due to the effect of increasing the percentage of HGVs.

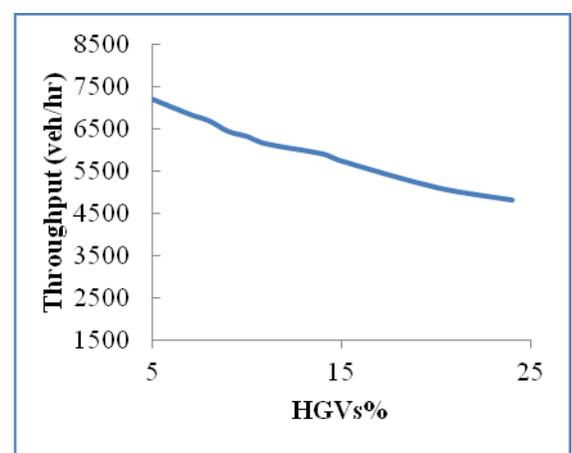
In light of the above, the percentage of HGVs has a strong effect in reduction the throughput from weaving sections. However, this effect differs according to the number of lanes in the weaving section.



a. Two lane section



b. Three-lane section.



c. Four-lane section.

Fig.6. Impact of HGVs on the capacity of weaving section

5.2 Impact of weaving length

As discussed in the previous sections, other characteristics of weaving section have been fixed such as the percentage of HGVs (15%), the ratio of VR (0.3) and R (0.4). Here, the weaving length has been changed from 100m to 700m to study its effect on the capacity of weaving section.

The impact of the weaving length on throughput for two, three and four lane sections is as shown in Figure 7. For all sections, the effect of the first 300m has large influence on the throughput of weaving section. Beyond this 300m, there is no significant effect. For example, the as the weaving length increases from 100m to 300m, the throughput increases from approximately 5800 to 6700 veh/hr for the four lane section. Similarly, for the two and three lane sections, the increase is from 2200 to 3100 veh/hr and 3800 to 4700 veh/hr, respectively.

In the light of the above, the effect of weaving length differs according to the geometric design of a weaving section. The effect of a two lane section is higher than the others. This could be attributed to the direct effect of weaving vehicles on the non-weaving vehicles due to restriction in the geometric design. In another words, the non-weaving vehicles have to follow the weaving vehicles. Therefore, the four lane weaving section has less effect than the three-lane and the later is less than the two lane section because of possibility of non-weaving vehicles to select other options such as cooperative lane changes

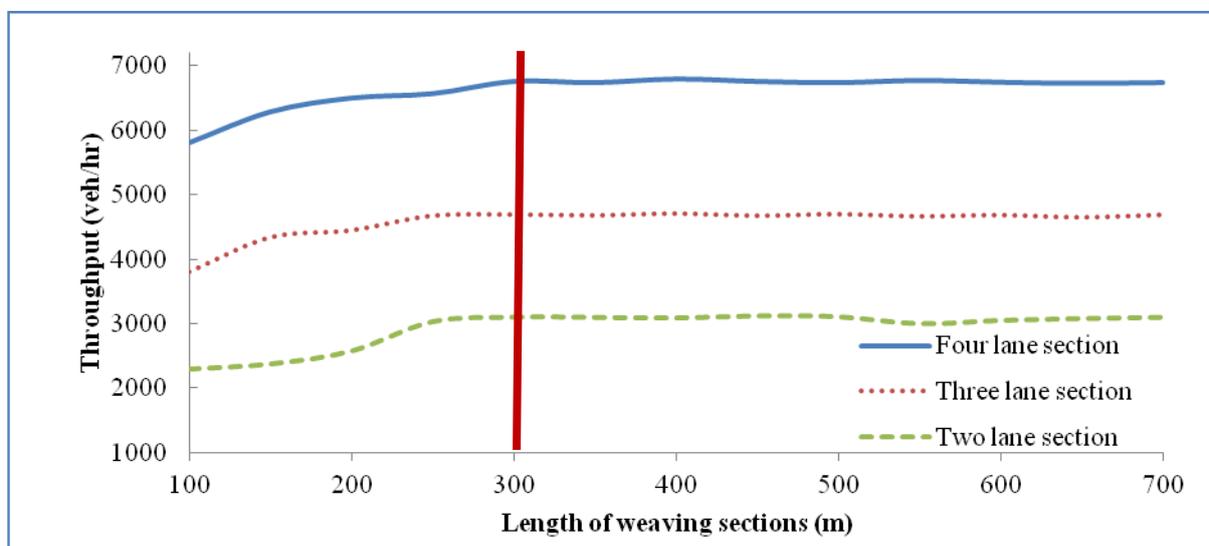


Fig.7. Effect of weaving length on throughput for two, three and four lanes weaving sections

5.3 Impact of VR

The effect of VR, which is the ratio of weaving vehicles to the total vehicles entering a weaving section, was investigated as shown in Figure 8. The conditions used here are similar to the ones used by the HCM and the INTEGRATION simulation package as reported by Zhang and Rakha (2005) to allow comparison.

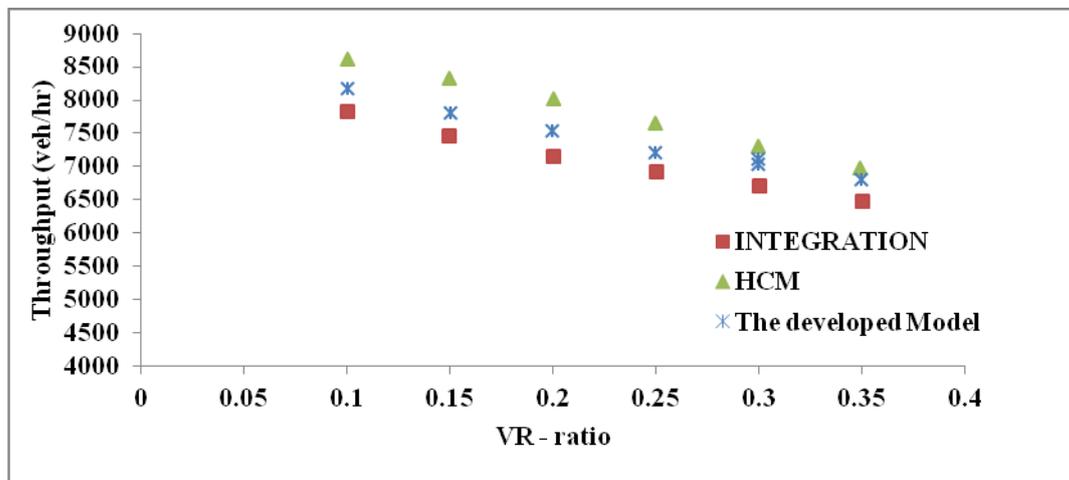


Fig.8. Comparison the developed model with HCM and INTEGRATION

The figure demonstrates that the developed model is slightly higher than the predicted values from the INTEGRATION model under different values of VR. However, it is lower than the HCM predicted values up to 0.25 and then they become approximately the same.

6. Conclusions

The main points of this study can be summarised as follows:

- The developed model has proved to be better than other simulation models such as Paramics, AIMSUN and VISSIM in terms of car-following behaviour. In addition, its lane changing behaviour shows reasonable representation of the observed data.
- The developed model shows good fit with field data used in the calibration and validation processes both graphically and statistically.
- Effects on throughput of HGVs, VR and weaving lengths were investigated using the developed model. It was found that the effect of HGVs was higher than the effect of other factors such as VR and weaving length on the maximum throughput of weaving sections.
- The effect of weaving length on throughput is up to a certain limit of weaving length, namely “effective length”. In this study, beyond 300m there is no influence of weaving length on throughput for two, three and four lane weaving sections.
- When testing the effect of VR on throughput, the developed model gave similar trend to those obtained from the INTEGRATION and the HCM (2000). However, the throughput was higher than that from the INTEGRATION and lower than the HCM (2000).

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Solar-Powered Wireless Network Control System Based on “True-Time” Simulator

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Abstract

Solar wireless networked control systems (SWNCS) are a form of distributed control systems where the information concerning control modules is substituted through communication networks. Due to the Significant benefits of WNCS such as reduced system wiring, low weight, and simplicity of system identification and conservation, the research on WNCSs has established greatly in last five years or so. In this paper investigate robust controllers will able to estimate and remove the effect of the delays time and a packet dropout occurs in the SWNCS. This can be achieved by designing and optimization a suitable Robust Model Predictive Controller (RMPC) with specific communications and control parameters using “true-time” co-simulation tools. The controller will able to enhancement the SWNCS performance by removing the effect of the delay occurs in the forward and feedback channel of the SWNCS. The delay time will be modeled as Markovian chain, the form regular of Linear Matrix Inequalities (LMIs) with unbounded limitations is assumed to obtain the RMPC. The “true-time” provides apparatuses for confirming the performance of the established Robust Model Predictive Controller RMPC approaches and instructions in an accurate SWNCS situation with actual methods. Furthermore, development of this true-time simulator tools according to adding the IEEE802.16e standard to wireless network on SIMULINK library in “true-time” and insert the RMPC parameters on the “true-time”.

Keywords

Linear Matrix Inequality, Model Predictive Control, Robust Control, true time, Wireless Network.

1. Introduction

The SWNCS offers a sustainable, multi-service infrastructure for the developing world, supplying wireless controlled allowed LED street lighting combined with a wireless communications network (WI-FI/WIMAX), all powered by solar energy. A SWNCS propose the following features and benefits, Safety and security, increased economic activity, wireless internet, VOIP telephony, CCTV surveillance, education, environmental monitoring, remote diagnostics and remote control. The SWNCS infrastructure comprises the nodes (pylon with solar panel, smart LED lamp-heads and integrated solar switched/mesh wireless devices), software tools to manage and control the system, communication backhaul links (wireless, wired or satellite) to the Robust Model Predictive Controller (RMPC) itself. Numerous infrastructures and employment systems of the current civilization can obviously be defined as networks of an enormous quantity of simple cooperating components. Samples approaching from the technical arenas comprise of transport networks, water distribution networks, power grids, telephone networks, mobile networks, and internet. However, additional actual related samples can be created in additional zones such as the global economic networks, the genetic look networks, the biological networks, and community

networks (Ghada, 2008). Actually, the main fetching characteristics of networked organized systems approached from their little cost, due to flexibility and simple re-configurability, due to normal reliability and robustness to uncertain parameters and signals, and due to modification ability. Certain features, however fairly obviously identifiable from normal networked system samples registered above, are continuous but not tacit and consequently their engineering applications are to originate. This is mostly because of the detail that it is continuous and not totally understood how the instructions defining the native connections and the network construction affect the belongings of the worldwide developing system. For this purpose it is a continuous hard job to design these native instructions and the network construction so as to obtain certain set universal performance. However, it is strong mutually in the manufacturing and academic world that this model will show a dominant character in the following emerging. At present the applied scientists and the control engineers in specific, have to manage with several new difficulties growing from networked systems when scheming multifaceted systems (L. Lin, 2005). Actually, due to the little price and the flexibility of communication networks (WIMAX, WI-FI, Ethernet, Internet, CAN), these are extensively utilized in manufacturing control systems (embedded systems, wireless sensors, cooperative systems, remote control). For example, the mesh knowledge on the internet now seems by way of a usual, cheap method to guarantee the communication connection in remote measured systems. In contrast, at the instant the applied scientist has insufficient instruments, which permit person to effort this construction, and they are mostly interested to decrease the undesirable influence produced by the actual environment of the communication networks (delays, packet dropout, sampling and data quantization). For these details we suppose that the influence of networks in control is leaving to be extra related in the emerging than in the existing. Furthermore, the difficulties growing in this background are slightly original, particularly of their disciplined environment. The author of reference Hnat (2009) Identified networked control in manufacturing submissions and the likelihood to simulate the network control systems by “true-time”. Provided an overview to the true-time tools and then contributes some cases in what way “true-time” can be employed to simulate networked control systems Anton Cervin (2007). While in reference Åkesson (2009) demonstrated the true-time network library for Modelica, established within the ITEA2 scheme EUROSYSLIB. A simulation environment that enables simulation of processor nodes and communication networks interrelating with the continuous-time dynamics of the actual world has introduced in Henriksson (2005). In contrast, this paper designed SWNCS with specific communications and control parameters using “true-time” simulator tools. Furthermore, adding the IEEE802.16e standard to wireless network on SIMULINK library in true time. Investigated robust controllers will able to estimate and remove the effect of the delays time and a packet dropout occurs in the SWNCS. This can be achieved by designing and optimization a suitable RMPC. The controller will able to enhancement the SWNCS Quality-of-Service (QoS) by removing the effect of the delay occurs in the forward and feedback channel of the SWNCS, the delay time will be modeled as Markovian chain, the form regular of Linear Matrix Inequalities LMIs with unbounded limitations is assumed to obtain the RMPC. Further work will be carried out to adding IEEE802.16e as another wireless network in the true-time SIMULINK library.

2. True-Time Tools

“True-Time” is a MATLAB/SIMULINK-constructed platform which was considered to simulate the chronological performance of multi-tasking real-time kernels comprising controller errands. The true-time model setting provides two-model blocks. A computer block and a network block as shown in the Figure 1. The blocks are adjustable stage, MATLAB S-functions written in C++ and discrete function. The true-time computer (Kernel) block

implements manipulator defined errands and interrupts processors. The true-time network block broadcasts information between computer nodes according to a selected network model. Computer and network blocks are event-driven with the implementation determined together by external and internal measures. The blocks inputs are supposed to be discrete-time signals, except the signals linked to the Analogue-to-Digital Converters (ADC) of the computer block, which can be continuous-time signals. The timetable and observers signals specify the distribution of shared resources throughout the simulation *Anton Cervin (2009)*.

2.1. The Computer (Kernel) Block

The True-Time computer block simulates a processor node using a broad actual kernel, Analogue-to-digital (A/D) and Digital-to-Analogue (D/A) converters, furthermore network interfaces. The block is organized through an initialization scenario. The scenario may be parameterized, allowing the similar scenario to be employed for numerous nodes. The True-Time computer block provides diverse preventive scheduling systems for instance static-priority scheduling and initial-target-major scheduling. It is as well executable to identify a custom scheduling strategy. The true-time computer block can be shown in Figure 2.

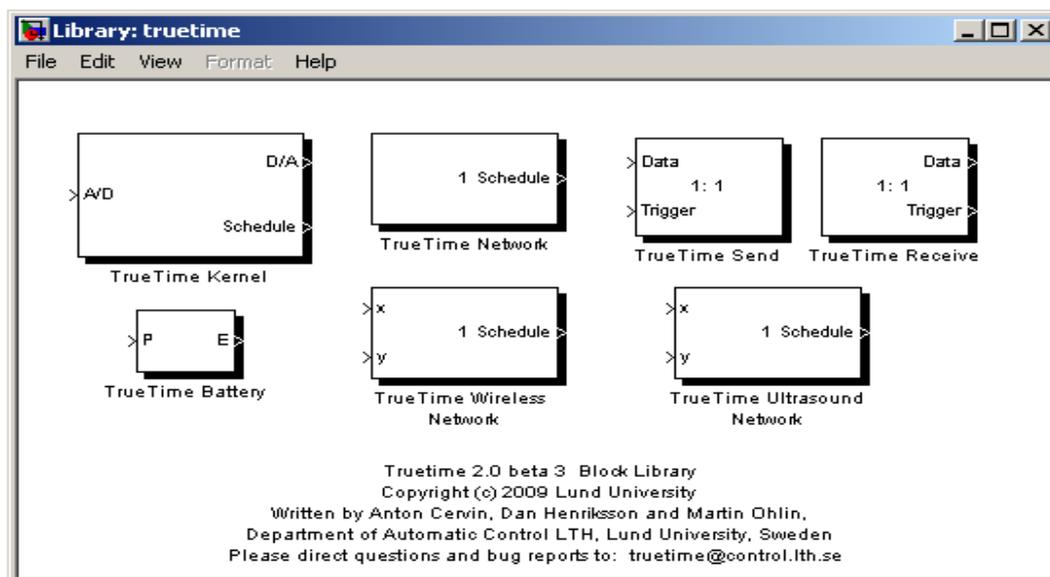


Fig.1. The true-time block library

2.2. Network Block

The True-Time network block simulates the physical layer and the Medium Access Control (MAC) layer of different local-area networks. The brands of networks provided are Carrier Sense Multiple Access with Collision Avoidance (CSMA/CD) (Ethernet), Carrier Sense Multiple Access with Arbitration on Message Priority (CSMA/AMP) Controller-area network (CAN), Frequency Division Multiple Access (FDMA), Time division multiple access (TDMA), Switched Ethernet, Round Robin. While, true-time wireless network block are supported WLAN (WI-FI), ZigBee (802.15.4), and WMAN (WI-MAX). The blocks simply simulate the scheduling, probable collisions or disturbance, and the point-to-point/propagate transmissions. As shown in Figure 3. The network blocks are mostly constructed

through their block information flow. Shared factors to all kinds of networks are the data rate, the minimum frame size, and the network interface delay. For wireless network there are amounts of additional factors that can be identified. Such as, for the wireless networks it is probable to identify the transmit power, the receiver signal threshold, the path loss exponent (or a distinct path loss function), the ACK timeout, the retry limit, and the error coding threshold *Song (2009)*.

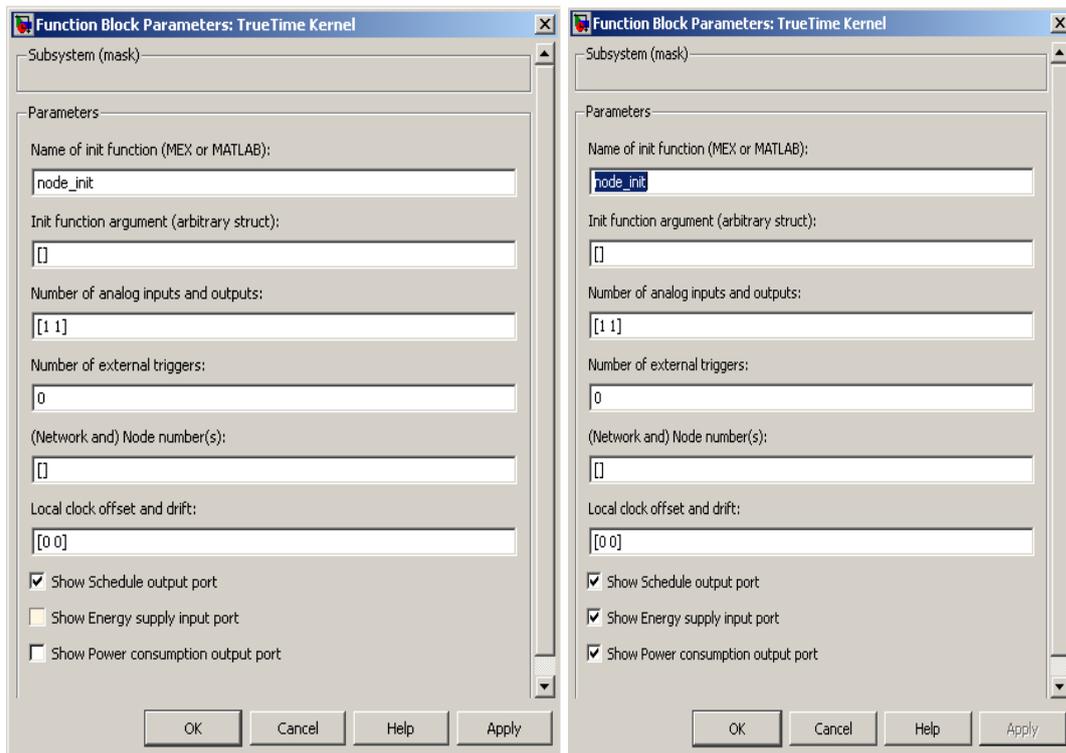


Fig.2. The Computer (Kernel) Block

3. Research Methodology

The research approach can be organized in the following foremost tasks associated to the estimated series of work desires:

3.1. Modeling and Process Identification

Modeling is a very significant measure of every engineering preparation. Currently with the employ of processors and influential software very difficult systems can be simulated and their execution can be anticipated and observed.

A. Solar Cell (photovoltaic) Model

A photovoltaic (pv) system may be used in this work to involve the solar panel and storage elements (battery). Figure 8 demonstrations the recognized single diode equivalent circuit

model of a solar cell. Neglecting the parallel resistance R_p , a mathematical model of a solar cell in single diode model, can be introduced as an exponential calculation *Ragusa (2009)*.

$$I = I_s - I_o \left(e^{\frac{V+IR_s}{V_T}} - 1 \right)$$

Where, I -solar cell current, v -solar cell voltage, I_s -source current, V_T -thermal voltage, I_o -reverse saturation current, and R_s -inherent resistance of solar cell, furthermore,

$$V_T = \frac{AKT}{q}$$

B. IEEE802.11b (WI_FI) Model

In the WI-FI simulation model, a packet broadcast is demonstrated in the following approach. The node that has requirements to transmit a packet verifies to realize if the intermediate is idle. The broadcast may continue, if the intermediate is established to be idle, and has remained consequently for 50 μ s. If, in contrast, the intermediate is established to be occupied, a stochastic back-off period is selected and decremented in the similar method such as when clashing. When a node begins to transmit, its comparative location to all additional nodes in the similar network is measured, and the signal stage in all additional nodes are measured in relation to the route failure expression $\frac{1}{r^2}$. The signal is supposed to be conceivable to discover if the signal stage in the receiving node is greater than the receiver signal verge. If this is the situation, then the Signal to Noise Ratio (SNR) is measured and employed to discover the block error rate. Observe that all additional broadcasts add to the related disturbance when computing the SNR. The proportion of number of incorrect blocks to overall number of blocks received on digital circuit is called the Block Error Rate (BLER) *Javvin (2009)*. BLER collected with the amount of the message, is employed to measure the quantity of bit errors in the message and if the fraction of bit errors is smaller than the error encrypting threshold, then it is supposed that the channel encrypting structure is capable to completely restructure the message. If there are already continuous broadcasts from additional nodes to the receiving node and their various SNRs are smaller than the recent one, then completely those messages are striking as clashed. Similarly, if there are additional continuous broadcasts which the presently transport node arrives with its broadcast, and then those messages may be striking as clashed also. Remark that a transport node does not distinguish if its message is clashing, therefore ACK messages are transmitted on the Medium Access Control (MAC) protocol layer. From the viewpoint of the transport node, missing messages and message crashes are the similar, that is, certainly not ACK is received. If certainly not ACK is received throughout ACK timeout, the message is retransferred subsequently waiting a stochastic back-off period within an argument space. The argument space amount is twice for each re-transferred of a definite message. The back-off regulator is block-off if the intermediate is occupied, otherwise if it has not been idle for at smallest 50 μ s *Anton Cervin (2009)*. The physical layer parameters simulation identify as in the *Rob Flickengen (2003)*. Figures 5,6 illustrative a IEEE802.11b SIMULINK model and SIMULINK library. Additionally, Figure 7 demonstrated the simulation of IEEE802.11b.

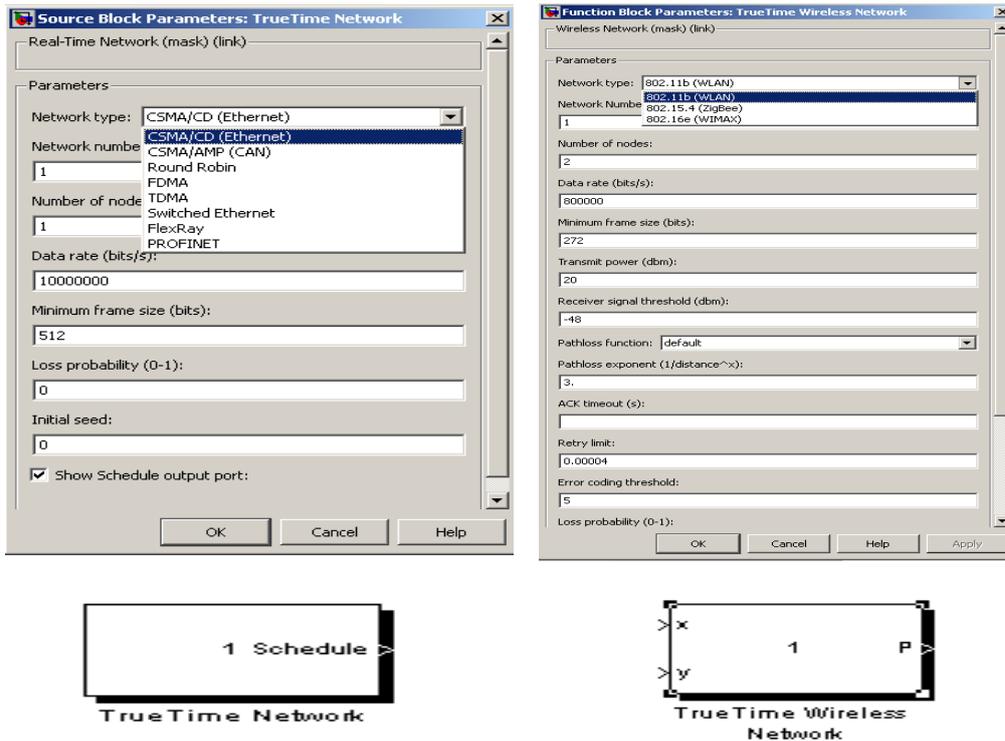


Fig.3. The true-time network block and true-time wireless network block

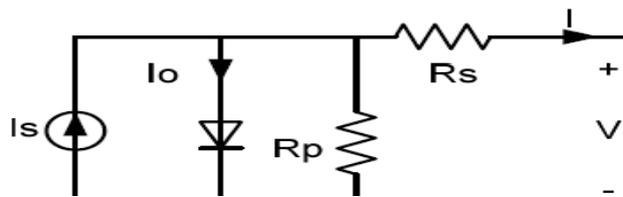


Fig.4. Solar cell circuit diagram

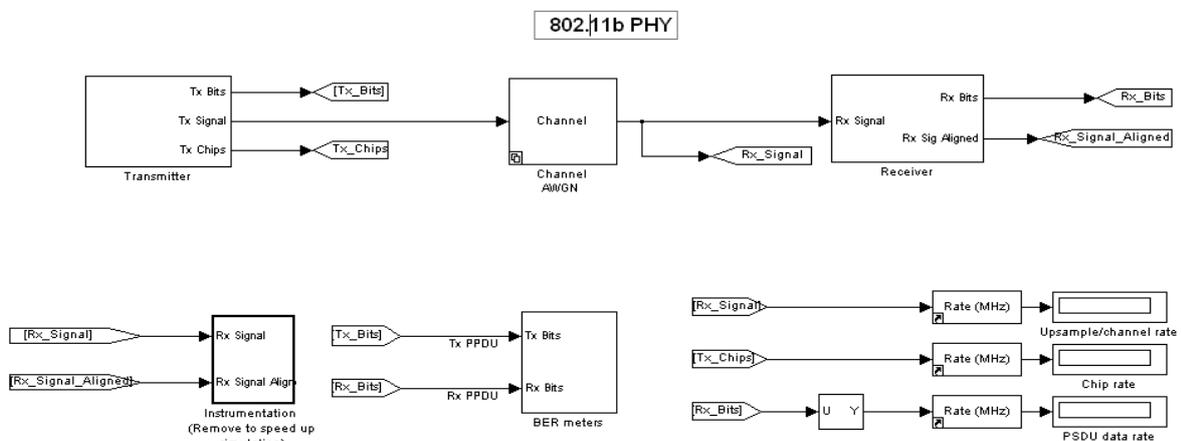


Fig.5. SIMULINK model for IEEE802.11b

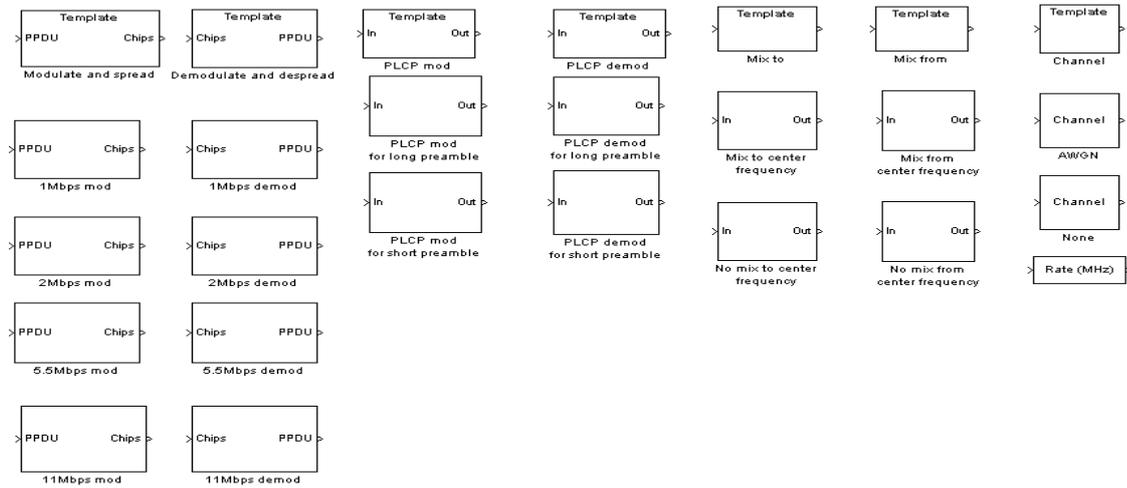


Fig.6. SIMULINK library for IEEE802.11b

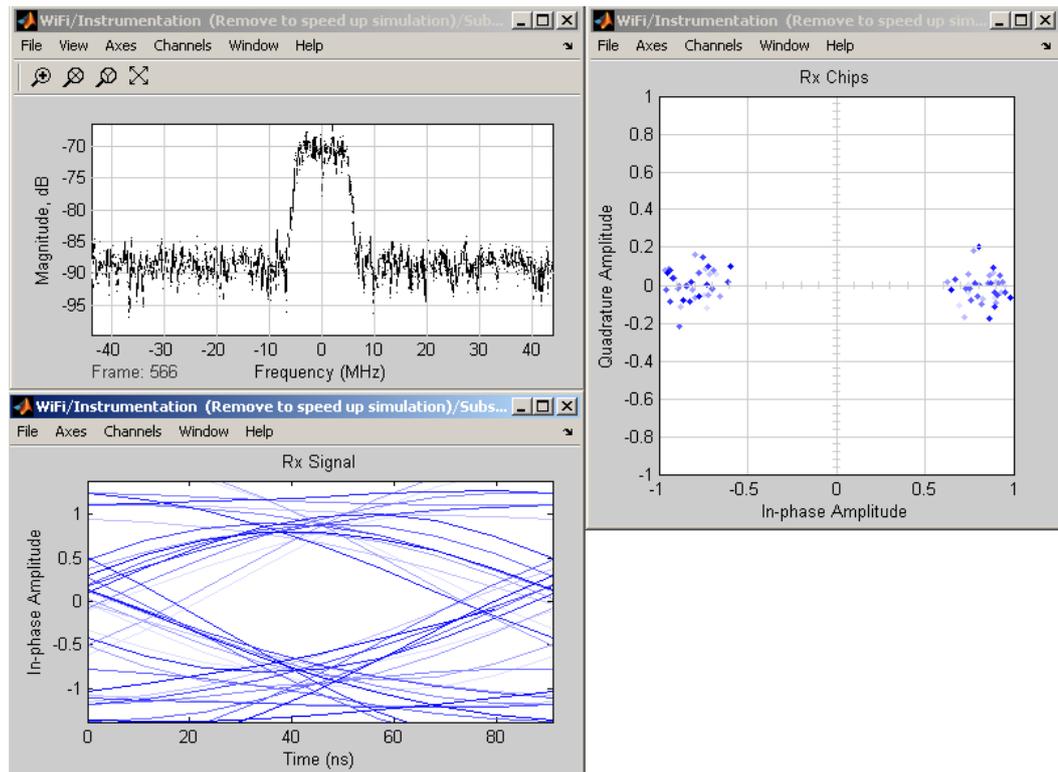


Fig.7. On-line simulation for IEEE802.11b

C. IEEE802.16e (WiMAX) Model

WiMAX has three elementary components, a transmitter, a channel through which the data is sent, and a receiver. The main elements of a WiMAX communication scheme are presented in Figure 8. The practical blocks that constitute the transmitter of the WiMAX emulator is described in Figure 9. While interactive through a wireless radio set channel the received signal cannot be just demonstrated as a transcript of the communicated signal degraded by

Additive Gaussian Noise (AGN). Alternatively, signal attenuation, though produced by the variant-time appearances of the broadcast setting seems, like this, small period oscillations produced by signal sprinkling of matters in the broadcast setting cause a phenomenon identified as multipath broadcast. The period scattering in a multipath setting produces the signal to experience either flat or frequency-choosy attenuation. Moreover, the period scattering is established by the scattering in time of the controlled codes directing to Inter Symbol Interference (ISI). So as to evade (ISI) in Orthogonal Frequency Division Multiplexing (OFDM) schemes, the recurring preface period has to be selected greater than the extreme delay feast of the channel. Furthermore, Root Raised Cosine (RRC) filters, typically employed for band bounding the communicated signal, are used as extrapolation filters in the trainer. The receiver fundamentally achieves the inverse process as the transmitter in addition to channel estimation essential to uncover the unidentified channel factors as demonstrated in Figure 10 *Amalia Roca (2007)*. The physical layer parameters simulation identify as in the appendix *Rob Flickenger (2003)*. The WiMAX SIMULINK model and SIMULINK library illustrative in Figure 11, and Figure 12 demonstrated the simulation of WiMAX.



Fig.8. WiMAX basic communication system

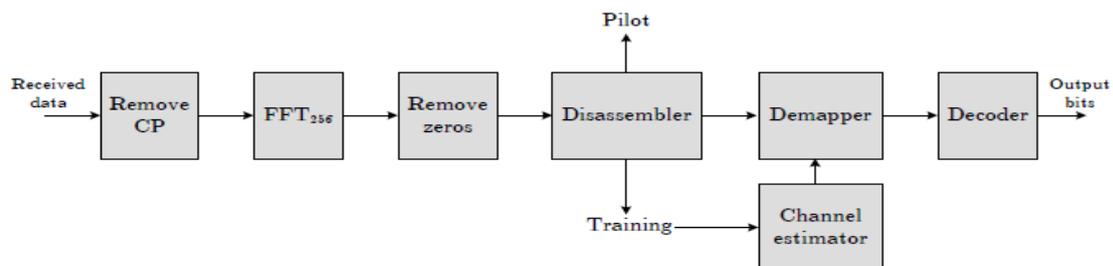


Fig.9. Transmitter structure of WiMAX for 256 subcarriers

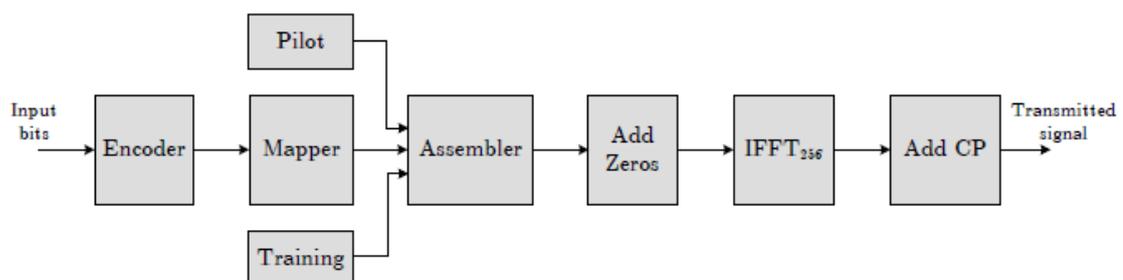


Fig.10. Receiver structure of WiMAX

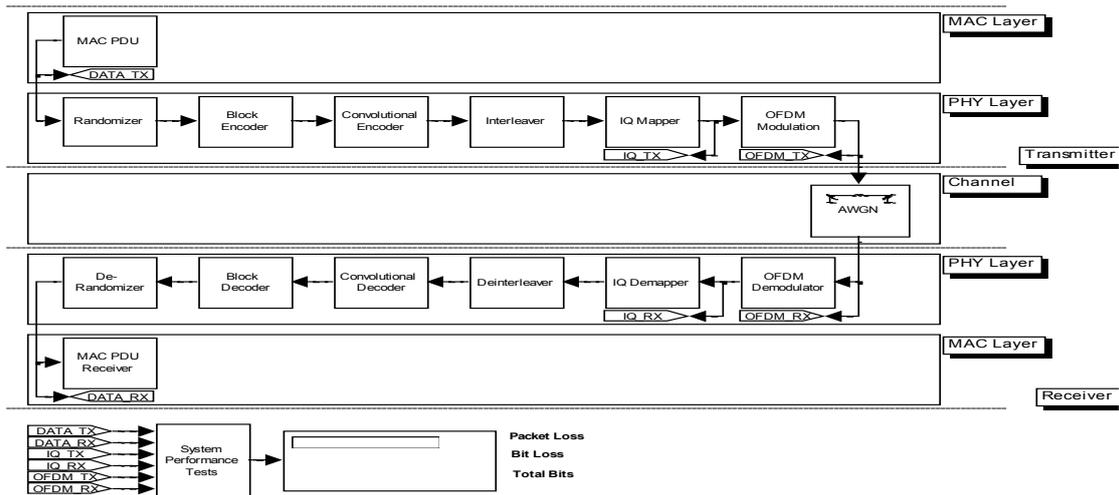


Fig.11. SIMULINK model for WiMAX

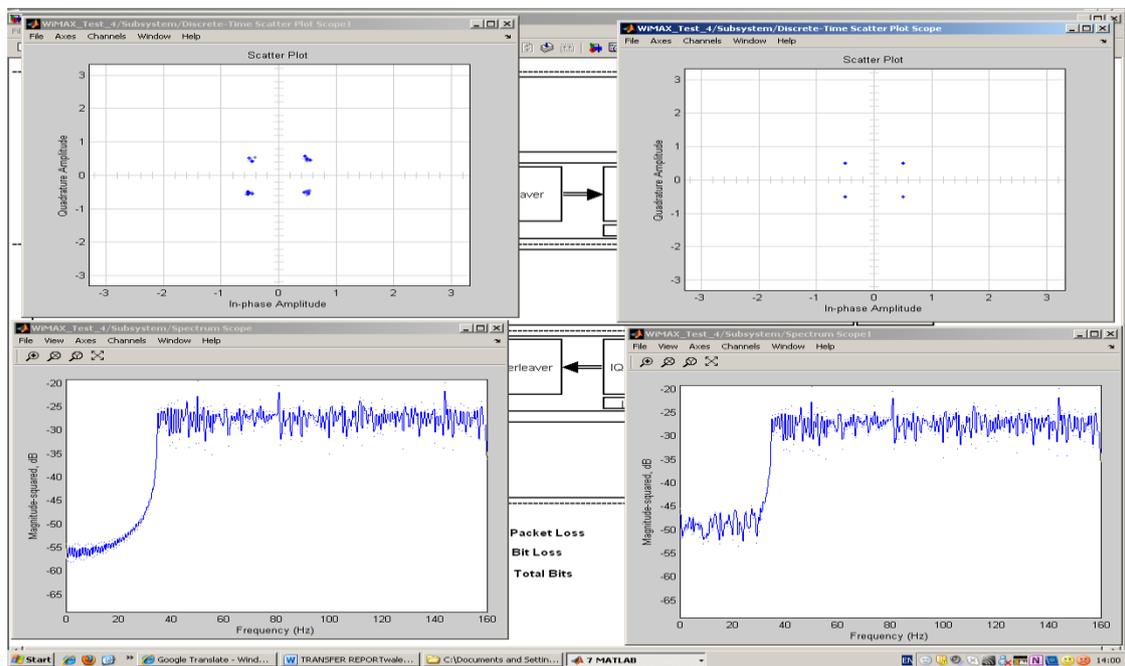


Fig.12. On-line simulation of WiMAX

4. RMPC Modeling and Assumption

Consider the WNCS in Figure 13, where the process is a linear time-invariant system, τ_k^{sc} is stochastic delay from sensor-to-controller, τ_k^{ca} is stochastic delay from controller-to-actuator, τ_k^c is time delay in controller. For determination purpose the all stochastic delays taken collected as $\tau_k = \tau_k^{sc} + \tau_k^{ca}$. The suppositions around the control system are defined. The controller and actuator are event driven. Furthermore, the sensor is time-driven, and the

wireless network delay time is unbounded, the overall delay is smaller than one sampling time, specifically, $\tau_k < k$. Consider a linear continuous-time-invariant process model in the WNCSs *Sun (2007)*:

$$\dot{x}(t) = A\dot{x}(t) + Bu(t) \dots \dots \dots (1a)$$

$$y(t) = Cx(t) + Du(t) \dots \dots \dots (1b)$$

Where $x(t)$ -state of the system $\in \mathfrak{R}^n$, $u(t)$ -control signal $\in \mathfrak{R}^m$, matrices A, B, C and D matrices with suitable dimensions. Discretise the system (1) at the sampling times k as:

$$x(k+1) = Ax(k) + Bu(k - \tau_k) \dots \dots \dots (2a)$$

$$y(k) = Cx(k) + Du(k - \tau_k) \dots \dots \dots (2b)$$

The main aim is to design a state feedback controller. In order to the output y of the feedback WNCS able to track a predictive signal y_p to achieve the wanted tracking performance. We assume that the predictive signal y_p is created by the subsequent system:

$$x_p = A_p x_p(k) + B_p R(k) \dots \dots \dots (3a)$$

$$y_p(k) = C_p x_p(k) \dots \dots \dots (3b)$$

Where $x_p(k)$ -is the predictive state vector, $R(k)$ -is the predictive input signal, $y_p(k)$ - is the predictive system output and matrices A_p , B_p and C_p matrices with suitable dimensions. It is supposed that both $x(k)$ and $x_p(k)$ are on-line determinate, and the computations of $x(k)$ and $x_p(k)$ are communicated with a single data packet. Furthermore, τ_k^{sc} and τ_k^{ca} are modeled as dual standardized Markov chains that receipts values in $M = \{0, 1, \dots, \tau_k^{sc}\}$ and $N = \{0, 1, \dots, \tau_k^{ca}\}$, and their transition probability matrices are $\Lambda = [\lambda_{ij}]$ and $\pi = [\pi_{rs}]$. That means τ_k^{sc} jump from mode i to j and τ_k^{ca} jump from mode r to s with probabilities λ_{ij} and π_{rs} , which are outlined by

$$\lambda_{ij} = Pr(\tau_{k+1}^{sc} = j | \tau_k^{sc} = i)$$

$$\pi_{rs} = Pr(\tau_{k+1}^{ca} = s | \tau_k^{ca} = r)$$

Through the limitations $\lambda_{ij}, \pi_{rs} \geq 0$ and

$$\sum_{j=0}^{\tau_k^{sc}} \lambda_{ij} = 1 \qquad \sum_{s=0}^{\tau_k^{ca}} \pi_{rs} = 1$$

For all $i, j \in M$ and $r, s \in N$.

It is well-known that the Markov chain structure has comprised the delay time and packet losses procedures in wireless networks instantaneously. It is observed that while the controller is calculated at present sampling time k , τ_k^{sc} can be achieved employing the sampling technique and the embedded processor can estimate the past τ_{k-1}^{ca} . Additionally, by seeing the stochastic delays time in the Sensor-to-controller channel $\tau_{k-\tau_k^{sc}-1}^{ca}$ can be achieved by the controller at present sampling time k certainly *Yu (2009) and Longhua Ma (2008)*. The state feedback controller can be calculated in the subsequent method:

$$u(k) = K_1 \left(\tau_k^{sc}, \tau_{k-\tau_k^{sc}-1}^{ca} \right) x_p(k - \tau_k^{sc}) + K_2 \left(\tau_k^{sc}, \tau_{k-\tau_k^{sc}-1}^{ca} \right) x(k - \tau_k^{sc}) \dots \dots \dots (4)$$

From systems (1) & (2), assuming the τ_k^{ca} , delays time we can get the subsequent improved system:

$$x(k+1) = \tilde{A}X(k) + \tilde{B}u(k - \tau_k^{ca}) + \tilde{J}R(k) \dots \dots \dots (5a)$$

$$E(k) = \tilde{C}X(k) \dots \dots \dots (5b)$$

$$\text{Where } X(k) = \begin{bmatrix} x_p^T(k) & x(k)^T \end{bmatrix}^T \quad \bar{C} = [-C_p \quad C]$$

$$\bar{A} = \begin{bmatrix} A_p & 0 \\ 0 & A \end{bmatrix}, \quad \bar{B} = \begin{bmatrix} 0 \\ B \end{bmatrix}, \quad \bar{J} = \begin{bmatrix} B_p \\ 0 \end{bmatrix}$$

The subsequent feedback control system is achieved

$$\xi(k+1) = \bar{A}(\tau_k^{sc}, \tau_{k-\tau_k^{ca}-1}^{ca}, \tau_k^{ca}) + \bar{J}R(k) \dots \dots \dots (6a)$$

$$E(k) = \bar{C}\xi(k) \dots \dots \dots (6b)$$

$$\xi(k) = \begin{bmatrix} x(k)^T & x(k-1)^T \dots & x(k-\tau_k^{sc})^T \\ u(k-1)^T & u(k-2)^T \dots & u(k-\tau_k^{ca})^T \end{bmatrix}^T \dots \dots \dots (7)$$

$$\text{Where } \bar{A} = \begin{bmatrix} A & [0 & \bar{B}K & 0] & 0 & 0 \dots & 0 \\ \vdots & & \ddots & & & & \vdots \\ 0 & & \dots & & & & 0 \end{bmatrix}$$

\bar{B} -is at $(1 + \tau_k^{sc} + \tau_k^{ca})^{th}$ block of the first row if $\tau_k^{ca} > 0$

$$K = [K_1(\tau_k^{sc}, \tau_{k-\tau_k^{ca}-1}^{ca}) \quad K_2(\tau_k^{sc}, \tau_{k-\tau_k^{ca}-1}^{ca})]$$

$$\bar{J} = [J^T \quad 0 \dots 0 \quad 0 \dots 0]^T$$

$$\bar{C} = [C \quad 0 \dots 0 \quad 0 \dots 0]$$

The main purposes of this demonstration can be continued as design of the full state feedback controller in the method of system (4), so as to achieved the feedback control system (6) as a robust stability and the norm of equation (6) is minimized.

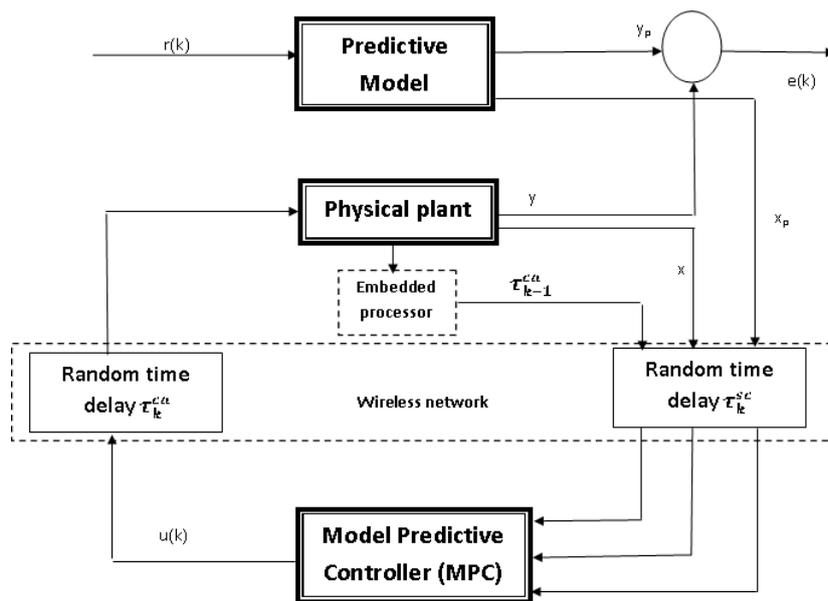


Fig.13. SWNCS diagram

5. Implementation of SWNCS in “true time” Simulator

The stages required to construct a wireless networked control application in “true-time” will be study in the model on Figure 13. In which two nodes are linked to a wireless network. The sampler (sensor) node samples the process output periodically and transmits the measurement values to the RMPC node over the wireless network. The reaching of sensor information data to the RMPC node generates a task that calculates a new control action. The control action is then transmitted to the Zero-order-hold ZOH (actuator) node, where it is sent to the process. The subsequent management and control demonstration and network schedule using Wi-Fi and WiMAX is presented in Figure 14 and Figure 15 respectively. The process output is maintained near to zero in spite of the uncertain parameters such as process disturbance, network induced delays and packet dropout. The schedule demonstrates that the network load is very high. Figure 16 illustrated the output response of the SWNCS when employed Wi-Fi and WiMAX as wireless network furthermore Figure 17 shows the schedule at computer node when used Wi-Fi and WiMAX, furthermore schedule at wireless networks to each Wi-Fi and WIMAX shown in Figure 18.

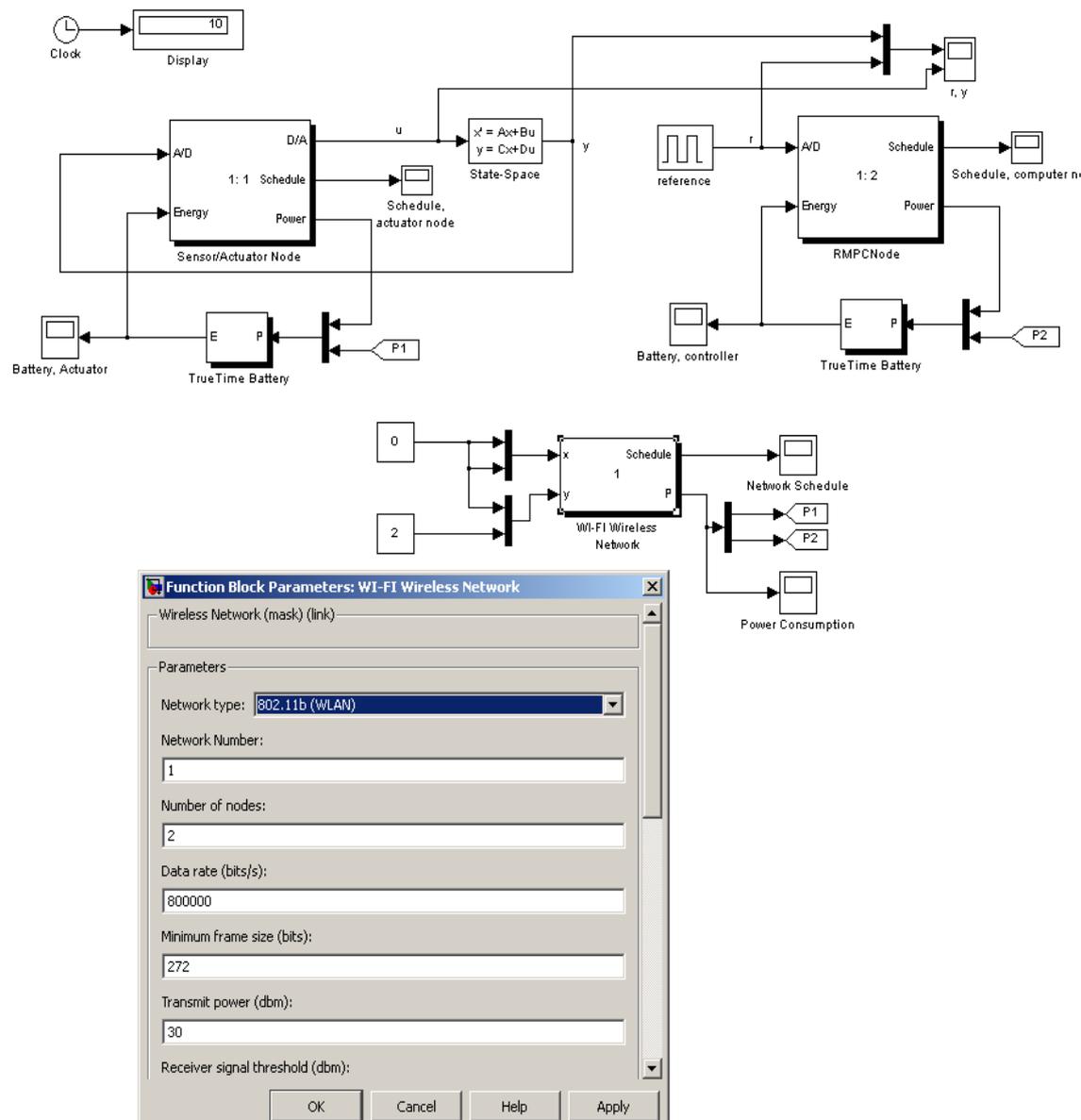


Fig.14. SWNCS with Computer nodes and Wi-Fi wireless network node

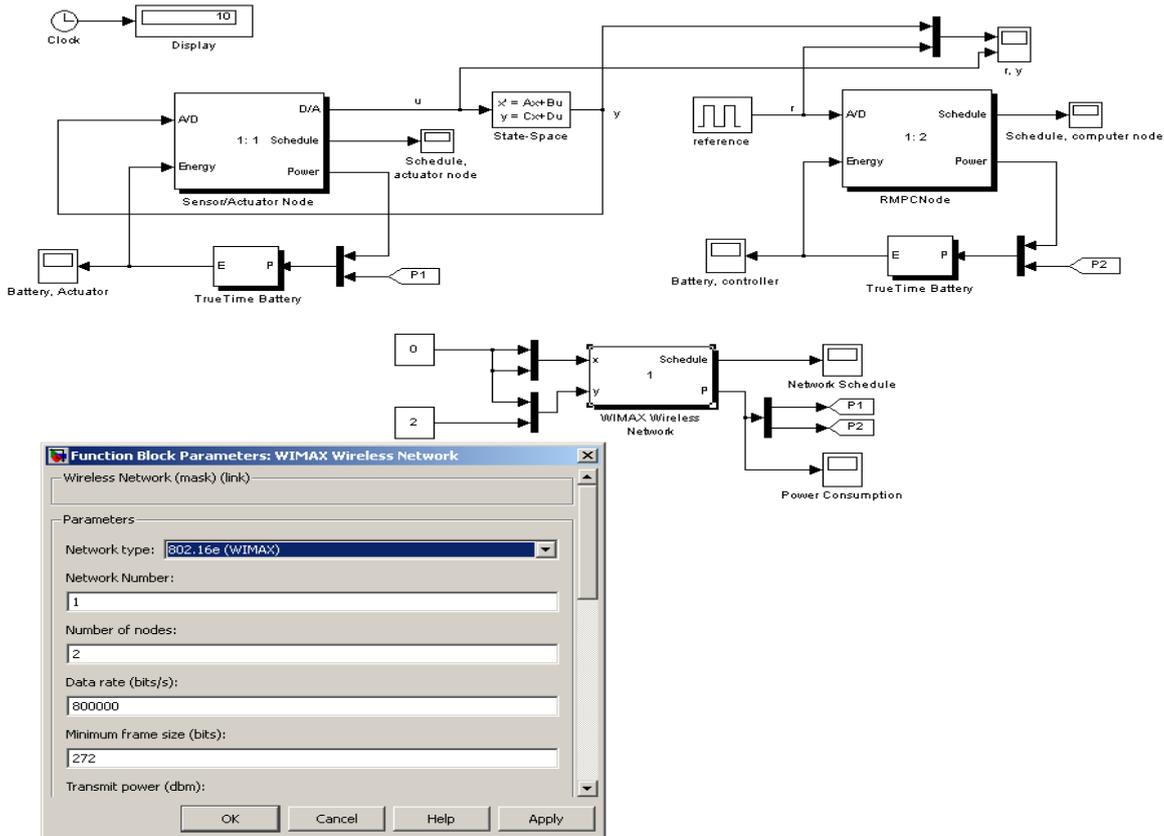
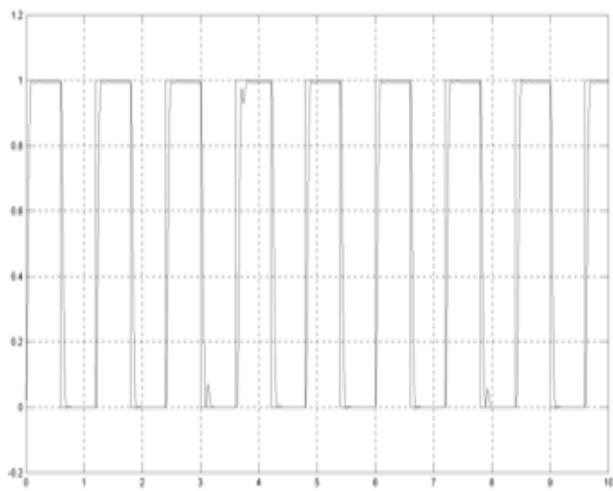
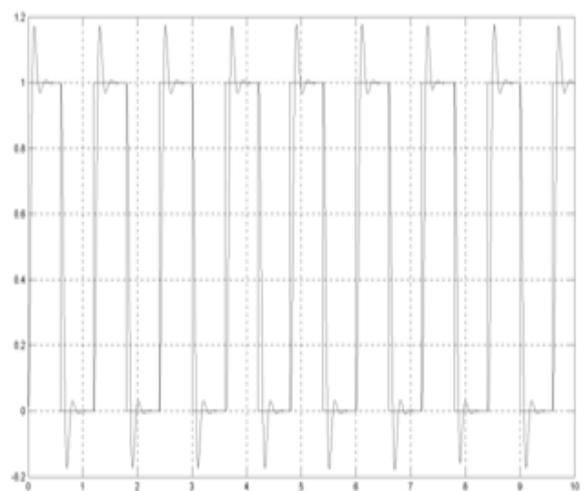


Fig.15. SWNCS with Computer nodes and WiMAX wireless network node

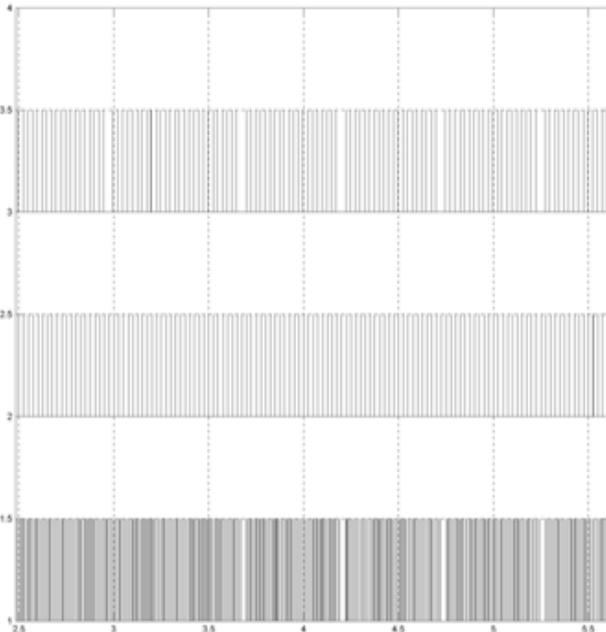


Wi-Fi wireless Network

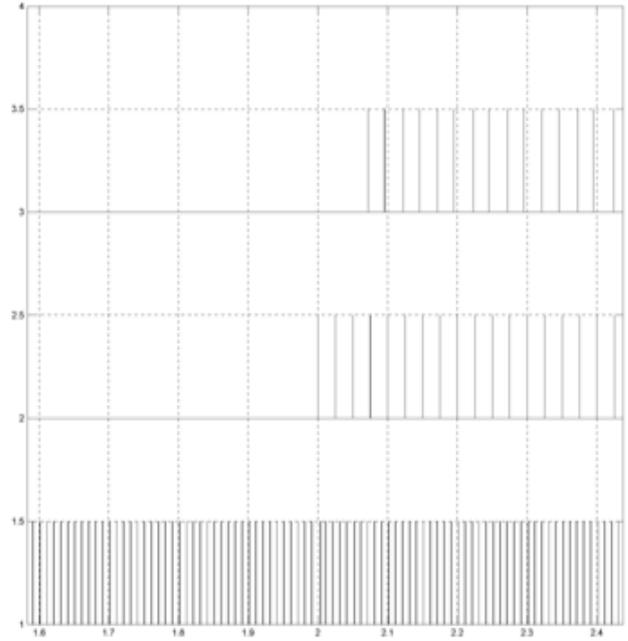


WiMAX wireless network

Fig.16. The output response for the SWNCS

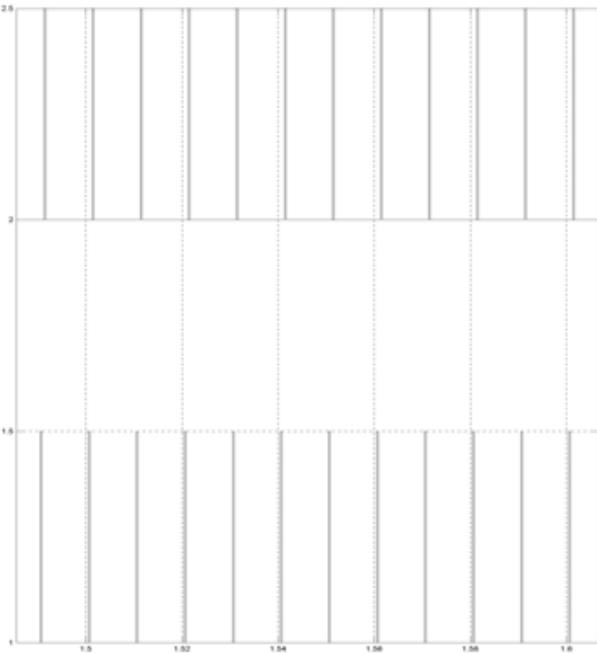


Wi-Fi wireless Network

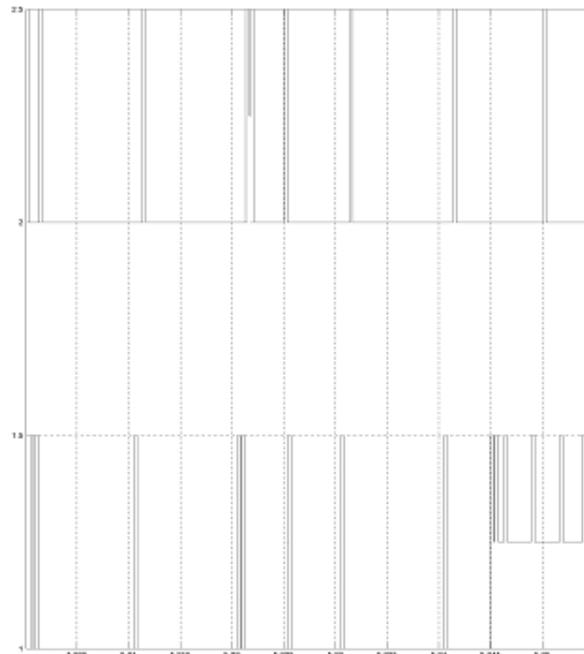


WiMAX wireless network

Fig.17. The schedule at computer node



Wi-Fi wireless Network



WiMAX wireless network

Fig.18. The schedule at wireless network node

6. Conclusion

This paper has demonstrated the SWNCS, their diagnostics and options. In this work we have investigated the RMPC design for SWNCS in order to control, manage and monitoring. Recently, this type of system can be very effective in many applications fields such as,

broadband service, security and surveillance, street lighting, furthermore wireless sensor for measurement of the weather all powered by the solar energy, and design SWNCS with specific communications and control parameters using true-time simulation tools.

The “true-time” provides apparatuses for confirming the performance of the established RMPC approaches and instructions in an accurate SWNCS situation with actual methods. Furthermore, development of this true-time simulation tools according to adding the IEEE802.16e standard to wireless network on SIMULINK library in “true-time” and insert the RMPC parameters on the true time co-simulation tools. As of the simulation consequences we can realize, that the (sensors, actuators) blocks are suitable for sending/receiving information without extra management and the RMPC blocks are suitable for simulating processors with a general actual kernel.

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Appendix

Wi-Fi/WIMAX PHYSICAL LAYER PARAMETERS

The physical layer parameters simulation identification for Wi-Fi

- The data rate selected from (1, 2, 5.5, or 11) Mbps.
- Packet size (1024)bytes
- Employ small introduction selection for (2, 5.5, or 11) Mbps.
- Channels type (none, or Additive White Gaussian Noise (AWGN))
- Channels number from (1-11).
- Channel noise power for (AWGN) selection.

The physical layer parameters simulation identification for WIMAX

- Spectrum (10-66) GHz.
- Data rate (32-134) Mbps.
- Cannel band-width (20, 25, and 28) MHz
- Modulation (2-PAM, 4-QAM, 16-QAM, and 64-QAM).

Vertical Earthquake Motion: A Review of its Effect on Structures

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Abstract

Civil engineering structures are generally subjected to three dimensional (3D) earthquake effects, namely vertical and horizontal earthquake in the three translational X, Y, and Z axes. So far, among these forces, horizontal earthquake has been acknowledged as the most dangerous structural damage. Experts generally suggested that vertical ground motion is of minor importance for the earthquake resistant design of structures. This kind of earthquake loading has been ignored in many codes of structural design. Meanwhile, many facts and field experience have proved that vertical ground motion plays a quite significant role in structure failures. Several large events, such as the Northridge earthquake in 1994, have provided valuable lessons since structural failures due to those earthquakes was mainly caused by vertical motion.

In this paper, a brief explanation about vertical earthquake motion characteristics will be discussed. Its influences upon structures are also clearly described, and recent research will be also presented.

Keywords: Earthquake, vertical ground motion, Seismic.

1. Introduction

An earthquake is a shaking of the earth's surface which is caused by energy transformation from its inner sphere. Generally more than one hundred and fifty thousand earthquakes occur each year across the globe. A seismic event is a series of sudden transient motions of the earth's crust due to a subterranean disturbance which then spreads in all directions. For thousands of years earthquakes have been noted as a dangerous cause of building and other structural failures.

1.1. Effect of earthquake upon structures

Energy from the seismic event impacts upon structures and potentially causes damage and debris which may be harmful to human beings. A comparison of energy released from earthquakes and various natural and man-made explosions is presented in figure 1. The largest recorded earthquake happened in Chile in 1960, reached 9.5 on the Richter Scale, and was determined to have released energy equal to around 50 billion kilograms of explosive. However, the energy transmitted through the materials of the earth and kinetic energy was reduced before reaching structures at the earth's surface.

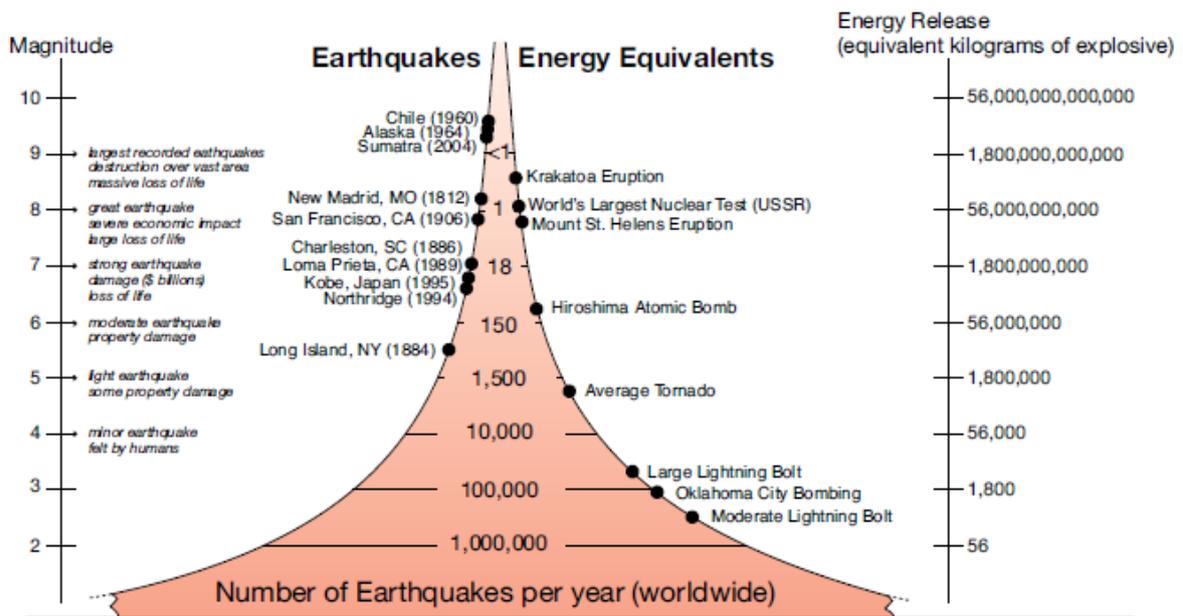


Figure 1 – Comparison between earthquakes and energy released by explosive material
<http://www.iris.edu/edu/onepagere/no4.pdf> [accessed on 7th June 2010]

Chopra (1995) said that when a structure is subject to an earthquake load, it receives energy from that loading which has been transferred first into the ground and produces ground motion. Earthquake motion may therefore be considered as the release of stored potential energy, converted into kinetic energy of motion. Shaking reduces with distance from the seismic epicentre.

Most earthquakes occur at the areas which lie along the tectonic plate boundary zones, mid ocean ridges or faults, as shown in figure 2. Earthquake epicentres from 1975 to 1995 are described in this figure and the depth of earthquake focus is signified by various colours. It can be seen that around ninety percent of earthquakes occur at depths between 0 to 100 kilometres.

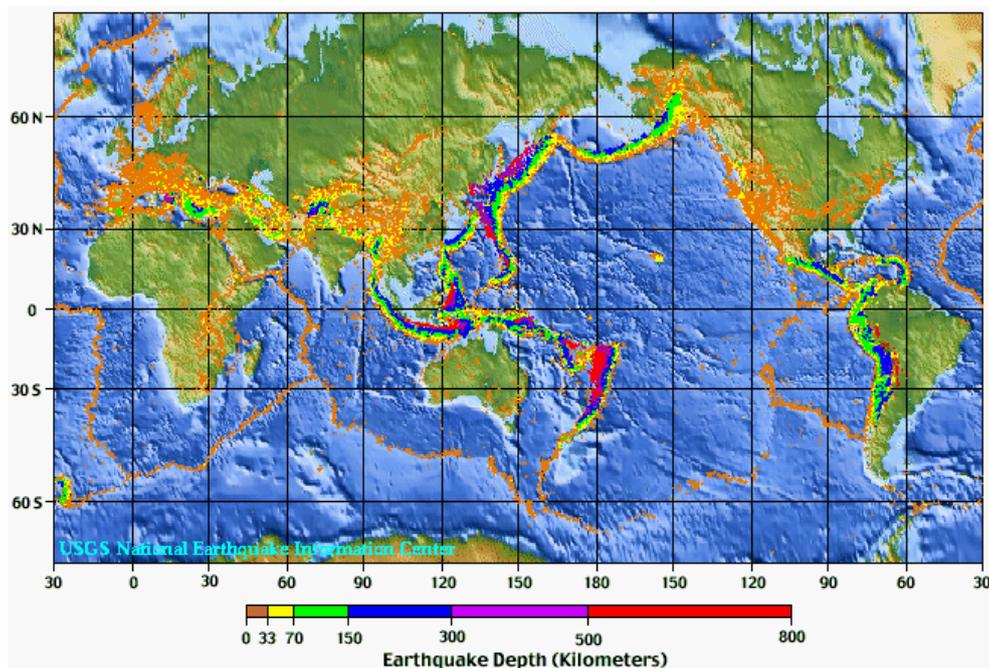


Figure 2 – Distribution of earthquake epicentres from 1975 to 1995. Source:
<http://www.physicalgeography.net/fundamentals/10m.html>

As the released energy travels through bedrock in a similar fashion to sound waves, the energy dissipates with distance in all directions starting from the earthquake focus becoming motion at the earth's surface, as shown in figure 3. The point directly above the focus, at the surface is the epicentre.

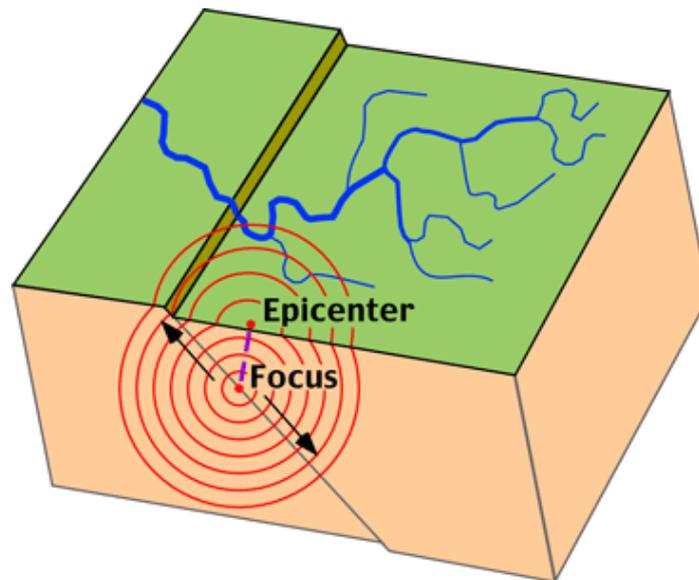


Figure 3 – Distribution of body wave of earthquake from its focus.
<http://www.physicalgeography.net/fundamentals/10m.html>

Beresnev (2002) stated that geologists describe two different seismic waves, namely body waves and surface waves. The former are the waves which travel through the lithosphere whereas the latter are the waves which run over the surface of earth. Body waves may be subdivided into P waves and S waves. P waves or Primary waves are caused by alternate expansion and contraction of bedrock. These waves can change the volume of material they travel through which could be solid, liquid, or gaseous materials. Conversely, S waves or Secondary waves can only travel through solid materials. This wave is slower than S waves and produced by shear stresses. S waves run through the materials in a perpendicular direction. Surface waves spread near the earth's crust. Swaying motions which people feel on the earth's surface are caused by these waves because they produce a rolling or swaying motion. Algorio (1990) noted although the speed of these waves are slower than body waves, they are more dangerous because they generate destructive ground movement, as shown in figure 4.

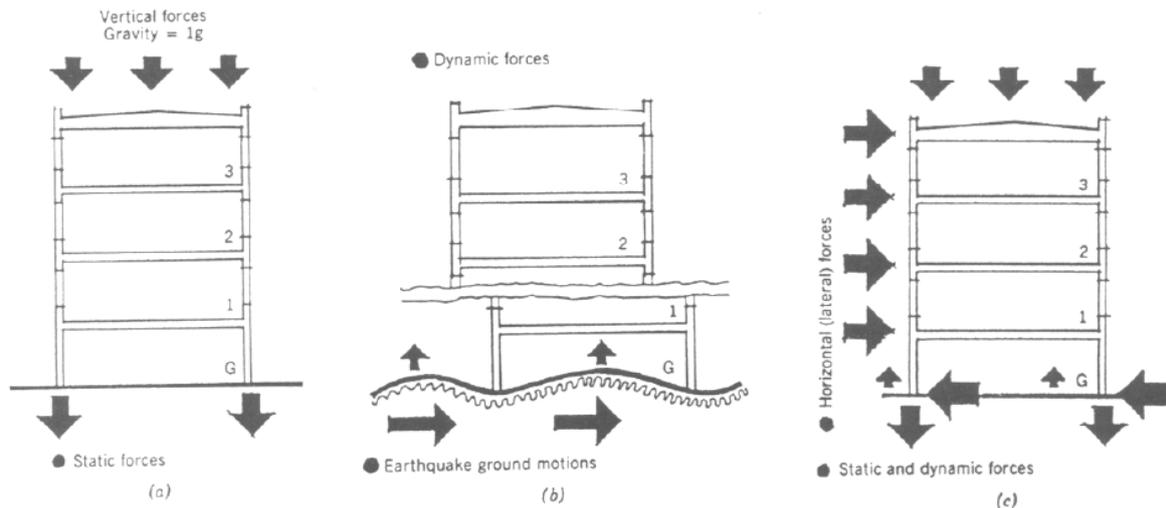


Figure 4 – Sway motion of structure under earthquake loads.

Source: Lagorio. Earthquakes: An Architect's Guide to Nonstructural Seismic Hazards, 1990

1.2. Effects of vertical earthquake ground motion

Elnashai and Collier (2001) stated that the vertical component of ground motion is mainly associated with the arrival of vertically propagating compressive P-waves, meanwhile secondary, shear S-waves are the main cause of horizontal components. The wavelength of P-waves is shorter than that of S-waves, which means that the former are associated with higher frequencies. Near the source of an earthquake, ground motion is characterised mainly by source spectra but modified by rupture dynamics. The P-wave spectrum has a higher cut of frequency than that of S-waves. P and S corner frequencies gradually shift to lower frequencies as waves propagate away from the source due to the differentially stronger attenuation of higher frequencies. Consequently, the vertical motion will be modified more rapidly. The behaviour of these two components of ground motion is often characterised by the V : H peak ground acceleration ratio.

Silva (1997) wrote that variation of vibrational properties of the structure has caused some influences to response analysis of the structures. Three of them are:

1. Amplitude and spectral content of earthquake motion vary with the magnitude and distance of the earthquake. However, relative amplitude of vertical motion is higher compared to horizontal motion for sites in an epicentral region.
2. When analyzing the response to vertical motion, variation of the amplitude and frequency content is to be considered.
3. For vertical members, axial force commonly becomes the cause of vertical vibration while for horizontal response is from shear and bending.

Response in vertical direction also would be expected to be rigid since the axial stiffness and strength in this direction are greater than flexure and shear. On the other side, response for flexure may be larger due to resonance.

Commonly a structure which is designed to high stress levels induced by vertical loads tends to be influenced by vertical ground motions; some examples are long span bridges and high rise buildings.

2. The development of research into vertical earthquake resistance

The need for definable levels of reliability in building structures increases with time, as society becomes increasingly dependant upon infrastructure. This is exacerbated in safety critical structures such as nuclear installations, particularly those constructed in seismic regions of the world. For this reason there is international interest and participation in the production and dissemination of research regarding earthquake resistant structures. Consideration of vertical earthquake motion has often been neglected in the past, however nowadays it has begun to take priority amongst the engineering community.

Saadeghvariri and Foutch (1990) stated measurements of ground motions during past earthquakes indicate that the vertical acceleration can reach, or even exceed values comparable to horizontal accelerations. Furthermore, measurements of structural response show the possibility of significant amplification in the response of bridges in the vertical direction that can be attributed to the vertical component of ground motion. Analyses of actual bridges indicate that in general, the vertical motion will increase the level of response and the amount of damage sustained by a highway bridge. Vertical motion generates fluctuating axial forces in the columns, which cause instability of the hysteresis loops and increase the ductility demand.

Kim *et al* (2000) presented a paper concerning analytical assessment of the effect of vertical earthquake ground motion on reinforced concrete (RC) bridge piers. A bridge structure damaged during the Northridge earthquake and a Federal Highway concept bridge design were examined. The effects of a suite of earthquake ground motion records with different vertical-to-horizontal peak acceleration ratios on the two bridges are presented and the results are compared with the case of horizontal-only excitation. The effects of arrival time interval between horizontal and vertical acceleration peaks are also reported and compared to the case of coincident motion. It is observed that the inclusion of the vertical component of ground motion has an important effect on the response at all levels and components. It is therefore concluded that vertical motion should be included in analysis for assessment and design, especially that there are no particular challenges impeding its inclusion.

Elnashai and Collier (2001) report a method to combine vertical and horizontal earthquake ground motion. In their paper, simple procedures are suggested for assessing the significance of vertical ground motion, indicating when it should be included in the determination of seismic actions on buildings. Simplified analysis may then be used to evaluate realistic vertical forces by employing the vertical period of vibration with pertinent spectra without resorting to inelastic dynamic analysis.

They explained the procedure as follow:

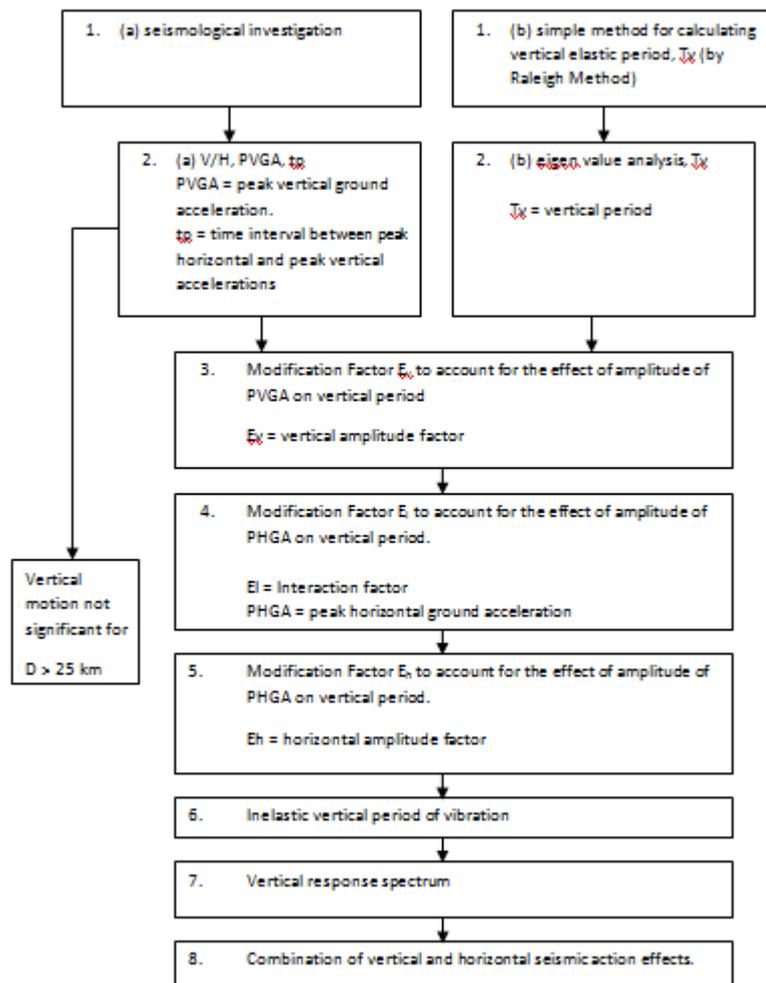


Figure 5 – Procedure for combining the vertical and horizontal action (Elnashai, 2001)

Legeron and Sheikh (2009) presented a theoretical approach to calculate support reactions of bridges under vertical earthquake ground motion. Based on this theoretical approach, an efficient method has been developed that enables the calculation of support reactions with less computational effort. The method can be easily adopted in the seismic design of highway bridges. They said that generally, three methods are used in practice for the calculation of support reactions:

1. Rayleigh method: This method has been recommended by American and Canadian bridge design codes for irregular ordinary multi span bridges and regular essential or emergency-route bridges. The Rayleigh method is generally not recommended for vertical ground motion since the choice of deflection shape for a complex system is not straightforward and does not provide results close to the exact calculation in most cases.
2. Modal analysis: This method is most suitable for structures with irregular geometry, mass and stiffness. This method does not take into account the nonlinear effects. However, nonlinear effect is not considered significant for vertical earthquake ground motion, as mentioned earlier. Moreover, ductility of bridge piers under vertical earthquake ground motion is not well known and usually considered to be low.

3. Time history analysis: This method is very complex and time consuming and is usually carried out only for critical structures in high seismic zones. Moreover, the choice of representative ground motion may add complexity in applying this method. Hence, elastic modal analysis has been considered sufficient for the calculation of support reactions under vertical earthquake ground motion in this study.

Most typical short and medium span bridges are very stiff in the vertical direction. Therefore, the first modes which contribute most to the seismic response have periods below the period at which design acceleration response spectrum starts to ascend. Hence, S_a can be considered as the maximum response spectral acceleration ($S_{a,max}$) for rigid bridges. This will provide a slightly conservative estimate of the support reactions, as some of the contributing higher modes, though not significant, may fall in the initial ascending branch of the response spectrum (period < 0.05 s) when such an ascending branch exists in code. It is noted that $S_{a,max}$ has been designated as a (in terms of g) for rigid bridges herein. Then the support reaction can be written as:

$$R_i = \sqrt{\sum_{n=1...4n} R_i^{n^2}} = \mu g L a \sqrt{\sum_{n=1...4r} \Gamma_i^{n^2}}.$$

- μ = superstructure unit mass
- g = response spectral acceleration at the effective period of supports
- L = main span length
- a = response spectral acceleration at the effective period of supports (for rigid bridge: maximum responses spectral acceleration)
- Γ = unit modal super reaction of mode n

3. Field experience of vertical earthquake motion

Much evidence has now been published stating that vertical earthquake motion has a detrimental effect upon structures. Papazoglou and Elnashai (1996) stated that the Greek earthquake of 1986 and the Northridge earthquake both generated serious failures attributed to high vertical horizontal ratios of ground motion.

3.1. *Response of substructure to vertical earthquake motion*

Vertical earthquake motion may have a significant energy content which is very dangerous to substructures e.g. retaining walls. Siddharthan *et al* (1992) found that vertical accelerations can have a significant effect on the displacement of gravity walls, considering both sliding and overturning. They assessed likely displacements using records from five earthquakes, considering both vertical and horizontal accelerations. They found that the displacements varied considerably even though the horizontal accelerations were all scaled to $0.3g$, and attributed this to the frequency content of the records but this could also be due to different levels of concurrency between vertical and horizontal motions.

Furthermore, Cai and Bathurst (1996) assessed modular block faced geosynthetic-reinforced soil retaining walls and showed that high vertical accelerations would give a lower critical horizontal acceleration, which would imply a larger displacement. Ling and Leshchinsky (1998) used pseudo-static limit equilibrium analyses to carry out a parametric study and suggested that vertical accelerations would be significant where the horizontal acceleration is greater than $0.2g$. They also presented a case study of a 6.0 m high geosynthetic-reinforced

wall that displaced 100 mm at the base during the 1995 Hyogoken-Nanbu earthquake, and attributed the displacement to the vertical ground shaking recorded in the area.

3.2. Response of superstructure to vertical earthquake motion

Kunnath and Zhao (2010), Khunnath (2008), and Karantzakis (2000) stated that superstructures can also suffer unduly due to vertical earthquake motion. Many severe failures during the Northridge earthquake in 1994 are attributed to vertical motion. In 2003, Rahai presented a model of an existing four span RC bridge, analyzed using the finite element method. A dynamic linear and nonlinear analysis of the model was carried out using different accelerograms and time-history analysis to study the longitudinal displacements, axial and shear forces in the piers. Results show the important variation of axial force values, which could produce circumferential cracks in the RC piers.

4. Recommendation regarding vertical earthquake motion

Many researchers in the field of earthquake engineering are now recommending further study regarding vertical earthquake ground motion.

Saadeghvariri and Foutch (1990) described that vertical motion can produce high magnitude forces in abutments and foundations that are not accounted for by the current seismic design guidelines. Therefore, it is important to consider this ground motion component in the design of highway bridges, especially for those located in regions near seismic faults where the effect is greatest.

Collier and Elnashai (2001) stated that the vertical component of earthquake ground motion has generally been neglected in the earthquake-resistant design of structures. Elnashai and Papazoglou (1996) described some field evidence and results from dynamic analysis on possible structural effects of strong vertical ground motion. These collectively confirm that structural failure may ensue due to direct tension or compression as well as due to the effect of vertical motion on shear and flexural response.

Shrestha (2009) also stated that in many earthquakes cases, the vertical component of the ground motion was found to exceed the horizontal component, which directly contradicts the current general code provision that assumes the value of the vertical ground motion to be between one and two thirds of the horizontal component. After almost every destructive earthquake some engineers postulate that structural damage was due to strong vertical ground motion. Therefore, seismic design of the structure without the consideration of the vertical ground motion component may result in unquantifiable risk of collapse, especially those constructed in the close proximity of the fault. However there seems to be little consensus as to the methods of quantifying the contribution of vertical motions in overall damage caused. Moreover, little has been learned from the recent earthquakes in Loma-Prieta, Northridge or Kobe which indicates conclusively that damage to structures was predominantly caused by vertical motions.

5. Conclusion

Vertical earthquake motion has often caused severe damage or failures in civil engineering structures. The consideration of vertical motion components has traditionally been overlooked in favour of dealing with the more obvious horizontal component. Seismic design of the structure without the consideration of the vertical ground motion component may result in unquantifiable risk of collapse, especially those constructed in the close

proximity of a fault. Therefore, further research is currently needed on the topic to allow expansion and updating of the European design standard EN 1998.

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The Effect of Adding Stiffeners and Lips to Cold-Formed Steel C Sections

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Abstract

This study is concerned with the use of cold formed steel channel sections as purlins in metal roofed buildings. This section type represents the mono-symmetric case. Uniformly distributed loads both in the downward as well as the upward direction will be considered. In all cases beams will be considered as simply supported.

Connection of roof sheeting to purlins provides lateral and rotational restraints to purlins.

The restraints to purlins may restrict buckling by increasing critical moment or the strength of the sections. In this study the effect of lateral and rotational restraints is investigated taking into consideration local, distortional, and lateral torsional buckling for detached and connected purlins as well as changing of geometry of the sections. Buckling is considered a critical phenomenon in various cold formed cross-sections for the majority of load cases before reaching yield point.

The results obtained from theoretical equations will be compared with those obtained from finite element analysis using ANSYS (release 12) for various dimensions of the purlins. The boundary conditions, which are used for the finite element members, need special consideration, particularly the shell type. ANSYS is used to simulate a real case of the structure.

The purlins have been analysed using the Simple Engineers Theory of Bending and ANSYS to predict the values of pure bending stresses and the combination of bending and warping torsion stresses as well as displacements.

Lips may play an important role to reduce the buckling phenomenon and the increase of the web depth should be limited to avoid buckling.

Keywords:

Channels Cold-formed lips steel stiffeners.

1. Introduction

This study is concerned with using some cold-formed cross-section for purlins. Cold-formed channel sections are widely used as structural members, such as purlins to support roof sheeting. Cold-formed steel sections have wide flexibility of cross-sectional profiles and sizes available to designers (Tran & Li, 2006). Some cold-formed members are simple to manufacture. However, more complex sections are required to fulfil many structural requirements. Some requirements are reduction of the weight and cost of constructions and to provide stability. Purlins are structural elements which link roof sheeting to structural frames or trusses, and transfer the loads from the roof to the main structure. Purlins are usually connected to the structural frame at the web using bolts and a support angle welded or bolted to the frame. Connecting of roof sheeting to purlins provides restraints to purlins laterally and rotationally (Chu, et al., 2004 & 2005; Katnam, et al., 2006 & 2007; Vieira, et al., 2010).

Buckling is considered a critical phenomenon in various cold formed cross-sections for the majority of load cases before achieving yield point (Cherry 1996; Chu, et al., 2004; Kankanamge, and Mahendran, 2009; Kolcu, et al., 2010)

This study considers the analysis of a cold formed steel section loaded in bending about its major axis (Al Nageim and MacGinley, 2005; Ambrose, 1997; Feng and Wang, 2004 & 2005).

The purlins have been analysed using Simple Engineers Theory of Bending and ANSYS to predict the values of pure bending stresses and the combination of bending and warping torsion stresses as well as displacements (Gotluru, et al., 2000). The results from a finite element analysis are compared to the results predicted by Simple Engineers theory of Bending (Ballio and Mazolani, 1983; Beale, et al, 2001; Gere & Timoshenko, 1987).

The concentration was on adding lips and stiffeners to the plain channel (Grey and Moen 2011)

The implementation of non-linearity has been found to be essential in the simulation in order to obtain good agreement with the real behavior of the structural members.

2. Calculation of Deflection and Stresses

2.1 Plane channel sections

The Analysis of a Simple Cold Formed Channel Section Loaded at the Shear Centre using ANSYS Software is conducted.

The section considered is a plain, unlippped channel with the following dimensions

Length 3000 mm

Web depth 150 mm

Flange width 65 mm

Thickness 1.5 mm,

The load applied is uniformly distributed along the length. The load is applied such as to introduce no torsion into the section.

2.1.1 Finite Element Analysis

The analysis is conducted using ANSYS software using the shell element type elastic shell43.

In order to prevent torsion, the load must be applied through the shear centre of the section (Gere & Timoshenko, 1987; Gotluru, et al 2000). For the section under consideration, the shear centre is outside the section, as illustrated below.

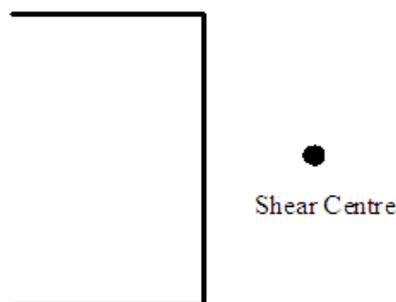


Fig. 3. The imagination position of the shear centre

The position of the shear centre can be calculated theoretically to be 22.426 mm from the centre of the web or obtained from ANSYS.

In order to simulate this load in ANSYS, the following idealization was used:

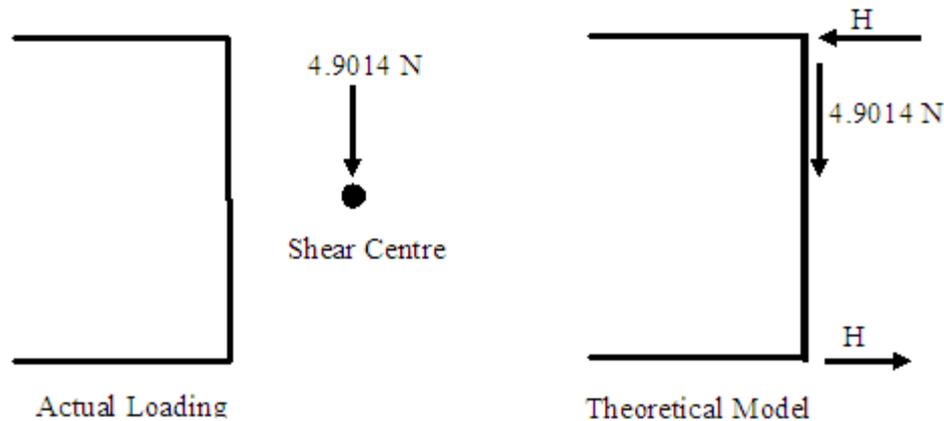


Fig. 4. Actual and theoretical loads

The section could be considered to be loaded by vertical load equal to 4.9014 N at the middle point of the web and together with two equal and opposite loads applied to the top and bottom flanges to counteract the torsion caused by the eccentricity from the shear centre of the vertical load.

The value of these horizontal loads can be calculated theoretically using the eccentricity from the shear centre.

$$i.e. \quad H = \frac{\text{Vertical Load} \times \text{Eccentricity from Shear Centre}}{\text{Section Depth}}$$

$$H = \frac{4.9014 \times 22.426}{150} = 0.733 \text{ N}$$

Alternatively the value of the horizontal force can be evaluated using ANSYS by initially restraining the flanges from horizontal movement as below.

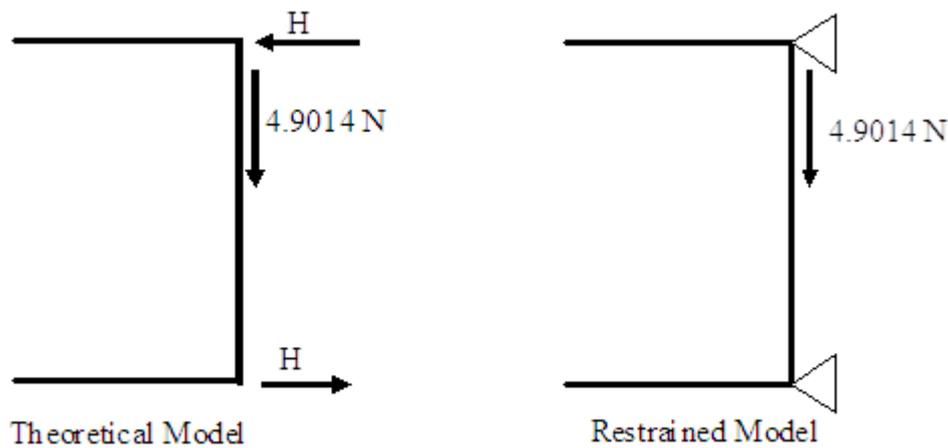


Fig. 5. Theoretical and Ansys model

The reactions at the horizontal ‘supports’ can be output from ANSYS. Ignoring a slight discrepancy at the ends, the value of these ‘reactions’ is 0.76692 N. These reactions could therefore be replaced by horizontal loads of 0.76692 N.

This compares with the value calculated above of 0.733 N.

These two methods of calculating the required horizontal loads that must be applied to prevent torsion therefore give agreement within 4.5%.

Applying the above loads the stresses and displacements at the seven points on the element can be calculated as illustrated in figure 4. These are shown in Tables 1 and 2.

It has been found that for using shell 181 the percentage of error of the displacements are less than when use shell 43, however, for stresses is vice-versa. the supports for shell43 is U_x , U_y , U_z at one end and U_y , U_z at the second end. And $Rot X$ at all the ends

The results when the loads above applied on the nodes mentioned with supports (U_x , U_y , U_z , $Rot X$, fixed at one end, and U_y , U_z , $Rot X$, fixed at the second end) at the mid-length of the web and vertical load at the same node but along the member, it has been found that the displacement and the stresses approximately the same as the same those obtained from theoretical equations. The equations used to calculate the stresses and deflections are based on Simple Engineers Theory of Bending.

2.1.2 Results

The stresses and displacements calculated at mid span by both methods are compared in the table below:

Table 1: Comparison of deflection and stresses plane channel section

Element	load	Nodes	δ	δ	Error %	σ	σ	Error %
			Theory	Ansys		Theory	Ansys	
E_1 3000*150 *65*1.5	q_1	1				-5.617	-5.48	2.43
		2				-5.617	-5.49	2.26
		3				-5.617	-5.51	1.9
		4	0.35	0.3483	0.29	0	0	0
		5				5.617	5.51	1.9
		6				5.617	5.49	2.26
		7				5.617	5.48	2.43

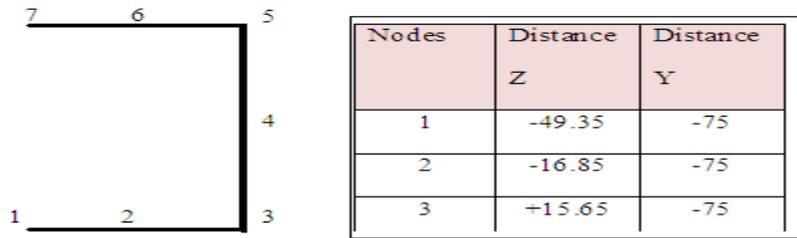


Fig. 6. Nodal Location

The ANSYS analysis used for the above table used the Shell 43 element, with a mesh spacing of at flanges (16.25 mm* 50 mm) and at web (15 mm * 50 mm)

2.1.3 Mesh Sensitivity Study

The investigation of the mesh sensitivity show that the size of the elements affects the results in somehow, but the percentage of the error does not exceed 0.4 %. Supports UX and UY fixed at one end and UY fixed at the second end. Uz is fixed at the nodes (where the web and flange are connected) along the member.

It has been found, the element is not very sensitive to the mesh element, that the percentage of the difference does not exceed 0.4 %, also for the distributions of stresses for the same element and the same cases of loading is shown in figure 5. It has been found, the element is not very sensitive to the mesh element, that the percentage of the difference does not exceed 0.3 %.

Table 2: Division of section parts to elements

Plane channel L = 3000 b = 150 b _f = 65 t = 1.5 in mm	case	Flange		web		Element along the length
		size, mm	elemnt	size, mm	element	
	a	65*100	1	75*100	2	30
	b	16.25*50	4	15*50	10	60
	c	8.125*50	8	7.5*50	20	60
	d	8.125*25	8	7.5*25	20	120

Table 3: Displacements of the three cases

case	δ_1	δ_2	δ_3	δ_4	δ_5	δ_6	δ_7	δ_8	δ_9
a	0.34727	0.34704	-	-	0.34735	-	-	0.34704	0.34727
b	0.34958	0.34941	0.34935	0.34955	0.34966	0.34955	0.34935	0.34941	0.34958
c	0.34819	0.34801	0.34795	0.34819	0.34827	0.34819	0.34795	0.34801	0.34819
d	0.34837	0.34825	0.34820	0.34839	0.34851	0.34839	0.34820	0.34825	0.34837

Table 4: Stresses on the cross-section of the mid-span of the member

case	σ_1	σ_2	σ_3	σ_4	σ_5	σ_6	σ_7	σ_8	σ_9
a	-5.4703	-5.4999	-	-	0	-	-	5.4999	5.4703
b	-5.501	-5.5086	-5.5211	-3.2773	0	3.2773	5.521	5.5086	5.501
c	-5.4852	-5.4934	-5.5122	-3.2683	0	3.2683	5.512	5.4934	5.4852
d	-5.4874	-5.4981	-5.5133	-3.2689	0	3.2689	5.513	5.4981	5.4874

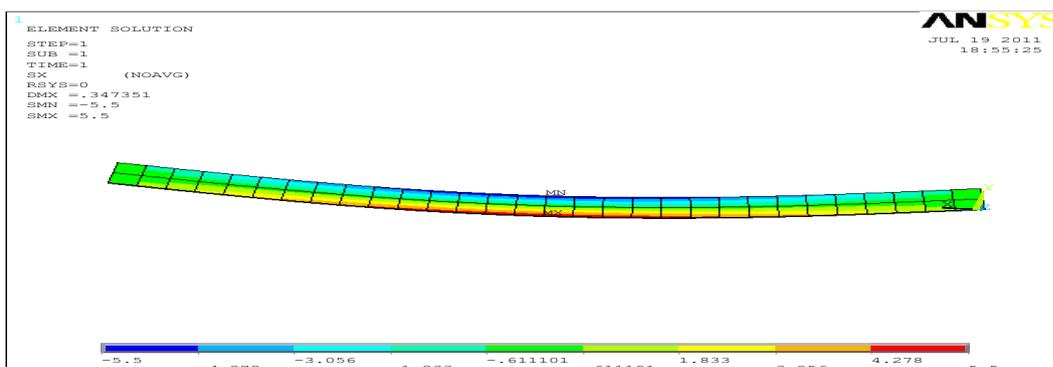


Fig. 7. Distribution of stresses using Ansys model

It can be shown that the deflection and stresses have quite a similar values when using simple engineering theory of bending, but the percentage varies according to the position of point. It should be noticed that the deflections and stresses increase whenever the loads increase. It has been noticed from tables 5, 6 and 7 that the increase of thickness from 1.5 mm to 2.5 mm of the section 150-65-1.5 reduces the deflection with 40% and also increases the flange width to 100 mm decrease the deflection to 46%. Whereas, increase the web depth from 150 mm to 250 mm decrease the deflection with 67% with reasonable cross section area.

Comparing the three elements, the values of stresses of the element 250-65-1.5 are less than others with 58% to the element 150-65-1.5 that indicates, the increase of web depth is better than increasing of thickness and flange width. However, the increase of the web depth should be limited to avoid buckling.

Element	load	Nodes	Distance Z	Distance Y	δ_{uu} Theo.	δ_{vv} Theo.	δ_{usum} ANSYS	Error %	σ Theo.	σ ANSYS	Error %
Zed L=3000 b=150 Bf=65 t=1.5	q ₁	1	+65	-75					6.14	6.07	1
		2	+32.5	-75					-3.049	-3.1	1.6
		3	0	-75					-12.24	-12.11	1.1
		4	0	0	0.30	1.54	1.49	3	0	0	0
		5	0	+75					12.24	12.11	1.1
		6	-32.5	+75					3.049	3.1	1.6
		7	-65	+75					-6.14	-6.07	1
	q ₂	1	+65	-75					14.29	14.11	1.3
		2	+32.5	-75					-7.09	-7.2	1.5
		3	0	-75					-28.48	-28.17	1.1
		4	0	0	0.7	3.58	3.46	3.4	0	0	0
		5	0	+75					28.48	28.17	1.1
		6	-32.5	+75					7.09	7.2	1.5
		7	-65	+75					-14.29	-14.11	1.3

Table 5: Displacement and stresses of Channel section.

Table 6: Displacement and stresses of Zed section.

Element	load	Nodes	Distance Z	Distance Y	δ Theory	δ Ansys	Error %	σ Theory	σ Ansys	Error %
Channel 3000*150*65 *1.5	q ₁	1	-49.35	-75				-5.617	-5.51	1.9
		2	-16.85	-75				-5.617	-5.53	1.55
		3	+15.65	-75				-5.617	-5.53	1.55
		4	0	0	0.35	0.349	0.29	0	0	0
		5	+15.65	+75				5.617	5.53	1.55
		6	-16.85	+75				5.617	5.53	1.55
		7	-49.35	+75				5.617	5.51	1.9
	q ₂	1	-49.35	-75				-13.07	-12.81	1.97
		2	-16.85	-75				-13.07	-12.86	1.59
		3	+15.65	-75				-13.07	-12.86	1.59
		4	0	0	0.817	0.814	0.37	0	0	0
		5	+15.65	+75				13.07	-12.86	1.59
		6	-16.85	+75				13.07	-12.86	1.59
		7	-49.35	+75				13.07	-12.81	1.97

2.2 Lipped channels

Table 7: Displacement and stresses of lipped channel section.

load	Element	Nodes	Distance Z	Distance Y	δ Theo.	δ_{usum} Ansys		σ Theo.	σ Ansys	%
Lip L=3000 b=150 Bf=65 t=1.5 c=20	q ₁	1	+65	-55				3.53	3.37	4.5
		2	+65	-75				4.8	4.73	1.5
		4	0	-75				4.8	4.73	1.5
		5	0	0	0.30	0.30	0	0	0	0
		6	0	+75				-4.8	-4.73	1.5
		7	+32.5	+75						
		8	+65	+75				-4.8	-4.73	1.5
		9	+65	+55				-3.53	-3.37	4.5

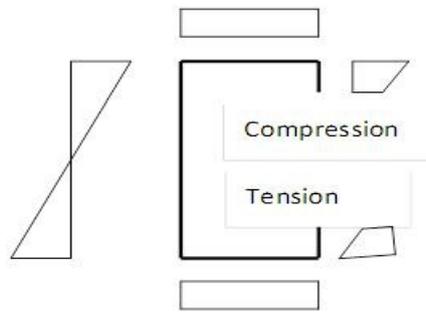


Fig. 6. Stress distribution of lipped channel section.

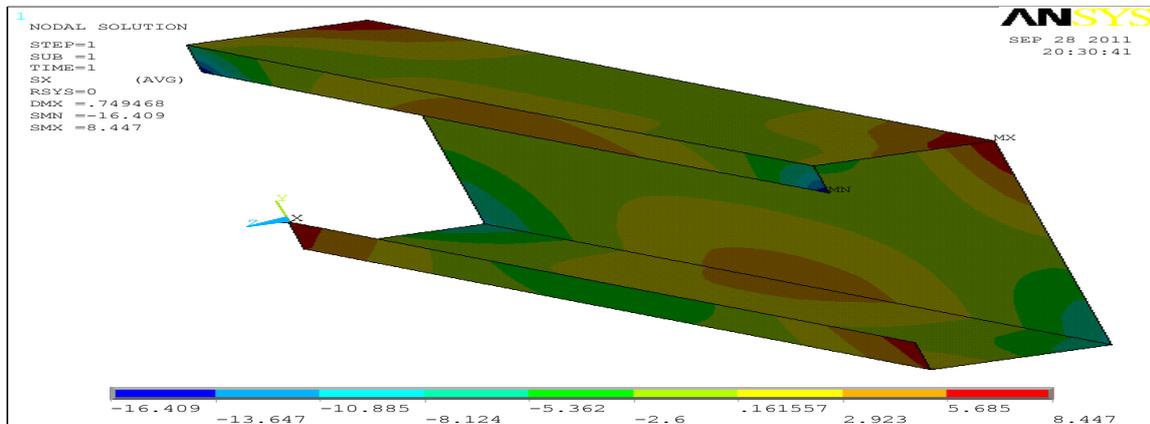


Fig. 7. Stress distribution of lipped channel section using ANSYS.

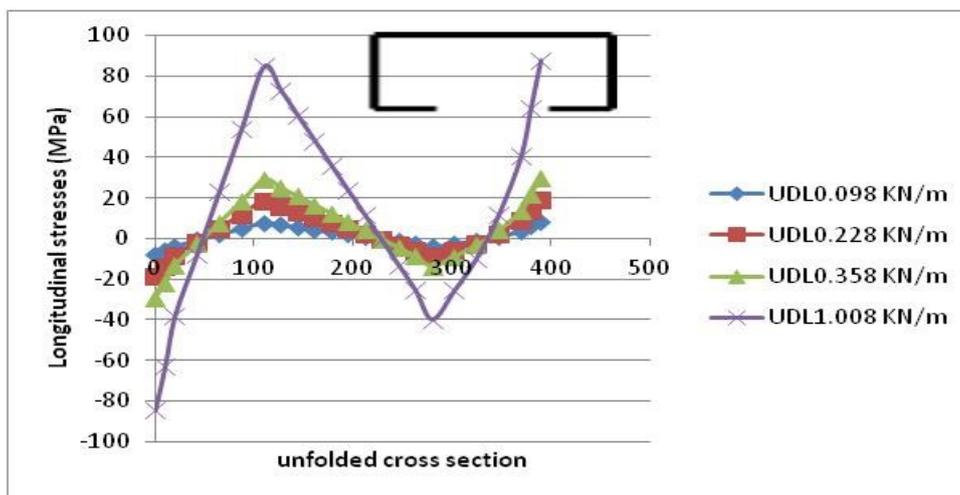


Fig. 8. Stress distribution for various uniform loads on lipped channel section.

2.3 Web stiffeners

A stiffened channel sections with using angle 45 degree element was used and supported at the both two ends. The element with dimensions 3000 mm span length, 150 mm web depth, 65 mm flange width, and 1.5 mm thickness. Uniformly distributed load, equal to 0.098, has been applied on the upper flange downwards (using pressure 0.0015). It has been analysis the

element using ANSYS. Fig. 9 shows the maximum deflection and the distribution of stresses on the section.

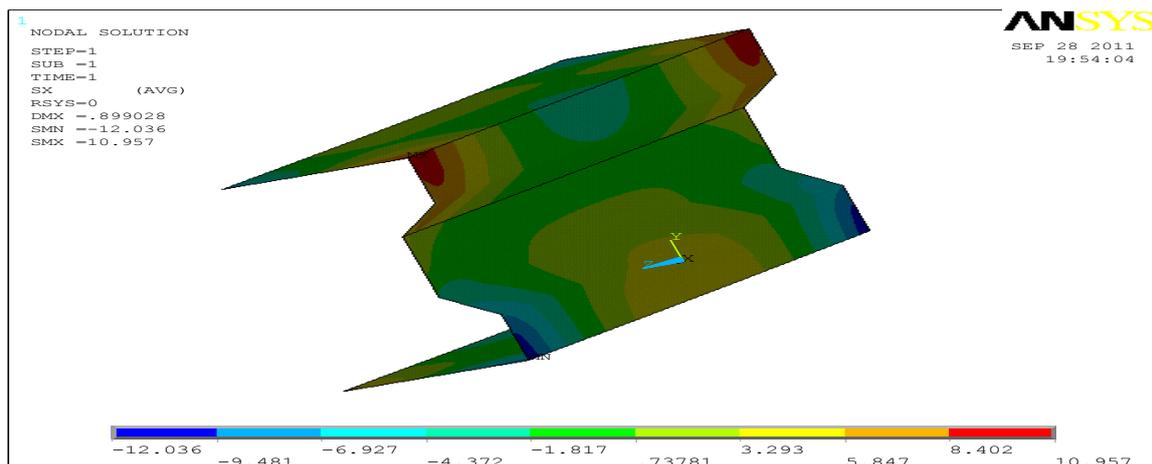


Fig. 9. Stress distribution of stiffened channel section using ANSYS.

3. Conclusion

The above tables illustrate that for this particular section under this level of loading, the ANSYS modelling proposal is valid, agreeing with Simple Engineers Theory of Bending within 3%

Longitudinal bending and warping torsion displacement and stresses have been studied in this work. It has been described the behavior of channel and zed shape purlin sections under uniformly distributed loads. It has been analyzed the channel and zed sections using two different methods; theoretical equations and finite element method to obtain the displacement and stresses of the sections. It has been found that the stresses are relatively complex due to the presence of bending and warping torsion.

It has been concentrated, when comparing between different cross-section, on the change of web depth, thickness, and flange width taking into consideration the effects of local, distortion, and lateral-torsional buckling and also the lateral and rotational restraints provided by roof sheeting to the purlins with channel and zed sections under uniformly distributed loads.

Conducting laboratory investigations is essential for purlins when doing a model to simulate the real case. It is also important to evaluate the analysis using finite element method by using ANSYS program.

The main advantage and ability of ANSYS program to compose the roof model is quick and easy. ANSYS provides a good opportunity to analyze the models that are needed for evaluation and investigation which resemble a real case. ANSYS software has the ability to evaluate cross-sections with any shape by using shell elements, for instance, adding lips and stiffeners.

The implementation of a non-linearity has been found essential in the simulation of the obtaining a good agreement of the real case of the structural members.

The requirements of boundary conditions for ANSYS have been discovered rather different than the application of normal supports in theoretical equations.

It has been noticed that, the increase of web depth is better than increasing of thickness and flange width. However, the increase of the web depth should be limited to avoid buckling.

It has been found that the lipped channel cross section is the optimum of all the other elements, that lips apply an important role to reduce the buckling phenomenon.

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Evaluation of Training Programmes Provided for the Academic Staff of Libyan Universities (Case Study: Tripoli University Tripoli, Libya): Methodological Perspective

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Abstract

Training programmes (TPs) are an essential feature of organisational life (Sandi and Robertson, 1996). Given today's business climate and the exponential growth in technology with its effect on the economy and society at large, the need for training is more pronounced than ever. So the provision of training can also help develop employee confidence, increase motivation and enhance job satisfaction. Taking a performance management approach to training means that training effort must make sense in terms of what a university wants each employee to contribute to achieving the university's goal. However, there is a lack of studies on the evaluation of training programmes in universities which are provided for the academic staff in Arabic countries and not one of those studies was carried out in the Libya context. Therefore, the research methodology has been designed with the aim of developing a framework that identifies the enabling factors for the implementation of TPs for the academic staff in Libyan Universities (LUs) by identifying what tools of modern technology exist and which are required in LUs. Furthermore, it concerns the evaluation of the TPs in the LUs and investigates the factors affecting their applicability for lecturers. Finally, it provides a practical framework for the decision makers in the Higher Education Ministry to develop TPs at LUs.

This paper will detail the methodologies adapted to fulfil these aims.

Keywords

Training Programmes, Higher Education, University, Libya, Research Design and methodology

1. Introduction

Training is generally considered as a contrastive concept to education. A classical although not consensual definition of education is adopted by UNICCO: "the organized and sustained instruction designed to communicate a combination of knowledge, skills and understanding valuable for all activities of life". Training is most usually associated with the world of work (Ollagnier, 2005). Nowadays its meanings vary from teaching someone how to perform relatively simple tasks to preparing someone for new job challenges, but some commentators consider that "the differences between education and training have always been exaggerated and the most reputable training programmes are education as much as training" (Moura Castro & Oliveira, 1994). According to Armstrong (1996), training is a process undertaken by people to enable them to perform better, and to make the best use of the natural abilities. In many Western developed countries to have well-established and resourced central units for academic staff development, normally called educational development units or academic development centers whatever their title, they all have as a central concern the quality of the educational experience of students, and perceive the unit's main purpose as initiating and implementing a wide range of policies to improve the quality of teaching the students receive.

There is a dearth of literature on academic development initiatives in the Arab world, and few existing HEI staff development centres, even in countries like Jordan, that have a long history of higher education Berendt (2005). also in Egypt which has the most important HES in Arabic world whereas poor training of the research quality attributed to Egypt's educational system, deficiency of highly qualified AS are among the main reasons which have led to the qualitative decline education in Egyptian universities (Belal and Springuel, 2010).

Additionally, UNDP (2002), points out that Arab countries' progress includes Libya in the areas of scientific research and technological development (R&D) and information communication technology (ICT) are relatively weak. Also, Arab countries have some of the lowest levels of research funding in the world. However, In 1991, an Arab Network for Staff Development was launched in agreement with UNESCO; their main aim was to set up programmes for the pedagogical training of university faculty in Arab universities (Hares, 1994). Libya has had phenomenal growth in the last years. The education sector has witnessed huge changes. This growth has not been without its challenges. These challenges include the lack of empirical research, over-reliance on expatriate academics, under-preparedness of students entering the HE sector.

This increase in the number of HEIs can be attributed to the increase in oil revenues which gave Libya the opportunity to accelerate the process of education development, as well as the restructuring and reform of the educational system in 1980 under what has been known as the New Educational Structure Plan. This paper is a summary of a PhD project concentrating on the evaluation of TPs provided for academic staff (AS) of Libyan universities (LUs), using a case study of Tripoli University in Tripoli. The paper includes the need for the research, the research questions, the expected contribution to the body of knowledge. The researcher will utilize different types of research methodology.

2. The Need for the Research

The rapidly evolving world of technology, modern means of communication, and the globalization of the labour market; have all introduced major changes in the patterns and methods of education and training in universities, where they have great impact in determining the level of human development. Nowadays there is massive expansion in Libyan universities (El-Hawat, 2006; Gannous & Aljoroushi, 2004). This expansion has been in quantity not in quality, thus there are a number of factors which make this study a valuable area to investigate.

2.1. The Weak Libyan Higher Education System (HES)

According to the Global Competitiveness Report GCR (2010), Libya ranks 128th out of 133 countries providing HE. In addition, the Libyan Education System (LES) has failed to achieve its goals. Libya ranks among the bottom one-third of countries surveyed.

In the HES there is no appropriate body setting standards and planning for the future skills' requirements of the job market (Porter and Yergin, 2006; UNESCO Regional Bureau for Education in the Arab States, 2003). Patterson (2007) mentions that there was an urgent need for investment and good management in Libya's HES. Furthermore, most of the academic staff in the Libyan HEIs do not receive adequate and effective training programmes in teaching and learning methods, despite being highly qualified in terms of scientific skills.

2.2. The Absence of Research in Libyan University Training Programmes

Training programmes in universities are an important sector of the public education system in Libya. The literature review has shown that there is very little research and literature available covering the problems and issues related to training programmes in Libya (TPL), particularly at Higher Education (HE) level. (Elzaitani, 2008). Also, UNDP (2002), points out that Arab countries' progress includes Libya in the areas of scientific research and technological development and information communication technology is weak.

2.3. Government Policy

The education system in Libya has become the focus of the government's strategy in more recent years (El-Hawat, 1996 and 2003; Gannous, 1999). Accordingly, during the 1990s, a network of Public Higher Vocational Education and Training Colleges was set up. The Libyan authorities are acutely aware of the need to raise the quality and standards in universities. Gibril Eljrushi, Dean of the Engineering Faculty at the 7th October University in Misurata, announced that the main aim of Libya's higher education strategy is to set up a knowledge-based Libyan society and to promote science-based industrial development. Eljrushi confirmed that among the strategy's numerous projects are the establishment of a National Authority for Scientific Research (NASR) and a Centre for Quality Assurance and Accreditation (CQAA) (Zaptia, 2009).

3. Research aim and objectives

The main aim of this study is to develop a framework that identifies the enabling factors for the implementation of Training Programmes (TPs) for the academic staff (AS) in Libyan Universities (LUs).

To achieve this aim, the research will focus on the following objectives:

- To review the relevant literature related to the Training Programmes for university academics around the world.
- To identify good practice in other countries (particularly the UK)
- To identify the existing TPs applied for academic staff in Libyan Universities.
- To evaluate the TPs in the LUs and to investigate the factors affecting their applicability for lecturers within the LUs.
- Analyse the challenges that face the implementation of TPs for AS in LUs.
- To provide a practical framework for the decision makers in the Ministry of HE to develop TPs at LUs.

4. Research Questions

a- What are the appropriate TPs for academic staff that are implemented in successful Universities such as UK universities?

b- Why are there no appropriate TPs introduced to the academic staff in LUs?

c- What are the barriers that affect the implementation of these programs?

d- What are the implications of these barriers?

5. Expected Contribution to Knowledge

This study will provide an investigation on the subject of TPs in the context of the Libyan environment. The purpose of this research is to identify the factors affecting the TPs provided to the academic staff by universities and to discover what issues arise from these programmes. There is a lack of empirical studies on TPs in LUs. Therefore, this study will add knowledge to this area. It will also contribute to the literature of TPs by identifying the key factors affecting the implementation of TPs in Libyan universities. As a result, at the end of this study the researcher will provide a framework which will show these factors and this framework could be used to remedy the problem of these TPs in LUs.

6. Training Programmes

Armstrong (1996) explains that training is a process undertaken by people to enable them to perform better, and to make the best use of natural abilities. A broad definition of training by Kitching and Blackburn (2002), and adopted for this study, states that training is any attempt within or outside the organisation which increases job-related knowledge and skills of either managers or employees. In this study, training during work as an academic addresses the most important element in the educational process – that of the teacher. It could be argued that this is the main factor contributing to the success of education, in achieving goals and roles in social and economic progress. Therefore teachers need to benefit from the all-new knowledge and technology, whether through self-growth, or through provided training.

6.1 Training programmes in LUs

The Resolution of the GPC No. 285 for the year 2006, on the staff members in universities and institutions of higher education provided priority of recruitment to the lecturers who hold educational qualifications, also the recruitment of new lecturers based on educational experience, as well as undergoing a training period of one year for new staff members, in this period there is no specific training program, rather this period is a testing phase until the lecturer is fully recruited in the Ministry of Higher Education (MHE). MA holders can become assistant lecturers. They can be promoted to lecturer status after three years of teaching. They are promoted to assistant professor status after having taught for four years and must have published at least four papers in scientific journals or conferences. Teachers are promoted to the status of professor after being a joint professor and having taught for five years (Clark, 2004). Academic staff can be promoted to the next academic degree, after passing through a specific period, depending on their position. There are also TPs for AS after four years' experience in university teaching as a sabbatical leave where they are dispatched for a period of one year to developed countries to train in the area of specialization, but unfortunately this program is not implemented on the ground. There are also training programs issued by the Ministry of HE under the auspices of quality training to prepare the leaders of the members of staff and these programs are in cooperation with the National Centre for the Development of the capacity of the training and leaderships in the Arab Republic of Egypt, where these programs are not compulsory and often the rate of attendance is very poor.

However, the challenges of poor and undeveloped existing infrastructure and a lack of skilled qualified and ICT-savvy teachers present a great challenge to the current reform process (Hamdy, 2007). The national policy for ICT in education was launched in 2005 and is mainly managed by the Ministry of Education and the Ministry of Vocational Training. The policy in general aims at enabling access to ICT through the provision of computers and the Internet.

According to Hamdy (2007), the education system in Libya paid more attention to the theoretical aspects of education rather than to the practical aspects.

Most of the academic staff in Libyan HEIs do not receive adequate and effective training programmes in teaching and learning methods, despite being highly qualified in terms of specialised scientific skills. Accordingly, the Libyan Delegation Report (1998) mentioned some points concerning quality in HE and one of these points was the skills of academic employees being developed.

7. Academic Staff of LHES

In 1956 the total number of teaching staff was six (Alshakshoki, 2006). However, since then the number has increased considerably over the past few decades. In 2009-2010 it reached 12,697. The Director of Planning General People's Committee (GPC) for HE expected that the number of AS members will increase to 20,000 members during the year 2011-2012 due to the HES plan for the period 2008-2012 (PANA, 2007). Although almost 50 years have passed since the initiation of the HES in the country it is still not only unable to graduate enough students to satisfy the urgent needs of the country but it is even unable to satisfy its own needs for teaching staff (Albadri, 2006).

It appears that the problem of a lack of staff members (in addition to the fact that the Libyan HES is incapable of producing enough numbers) may also be attributed to the loss of qualified and capable professionals to other countries.

8. Research Methodology

Research methodology is the process followed by a researcher to achieve the aim and objectives of a particular study. It provides the basis to make informed decisions, step by step, about how the research should be conducted. Moreover, research methodology comprises several key elements that a researcher should consider when undertaking research, for instance, the overall research approach, data collection techniques and data analysis techniques (Collis and Hussey, 2009).

8.1. Research Philosophy

The term 'research philosophy' relates to the development of knowledge and the nature of that knowledge. As stated by Saunders et al. (2007), Easterby-Smith et al. (2002) some reasons why an understanding of philosophical issues is useful for the author is 'It can help in clarifying the research designed; also, it can enable avoiding going up too many blind alleys. In addition, it can help to identify and even create designs that may be outside his or her past experience. And it may also suggest how to adapt research designs according to the constraints of different subject of knowledge structures'.

Many authors such as Remenyi et al. (1998), Easterby-Smith et al. (2002), Saunders et al. (2003) and Collins and Hussey (2003) have mentioned that there are two main research philosophies: phenomenology (interpretivism) and positivism (Hussey and Hussey, 1997; Collis and Hussey, 2009).

Easterby-Smith et al. (2009) summarised the distinction between positivist and phenomenological philosophies. The interpretivism or (phenomenological) has been selected as a philosophy in this research for two reasons:

- The nature of the research is social, the researcher deals with beliefs, reality, attitudes and experience exchange between people regarding the barriers that affects the implementation of TPs for AS in LUs context. This supported by some authors, Hussey and Hussey (1997), Collis and Hussey (2003).

- The author is involved in the context of the research which is refers to the subjective aspects of human activity, and by focusing in meaning rather than measurement. This is supported by some authors like, Creswell (1994); Patton (2002), Allison et al., (1996).

8.2. Research Approach

There are two main research approaches, the deductive and inductive approaches. Quantitative research is deductive in nature (deductive testing where the theory depends on the literature review: from this ones gets the hypothesis, starts general and ends with the specific); it allows the researcher first to collect the data and then to generate hypotheses or propositions that can be tested quantitatively (Hussey and Hussey, 1997). Whereas the inductive approach is often associated with qualitative research in which the researcher collects data and develops the theory as a result of data analysis (Saunders et al., 2007). Inductive research builds up the theory and starts with the specific rather than generalities.

Effectively, Saunders et al. (2007) recommended the combining of the deductive and inductive approaches within the same piece of research. According to that recommendation, and in order to enhance the validity of the research, the researcher has chosen to use the triangulation approach by combining the deductive and inductive approaches in order to achieve the objectives of the study. Thus, in this research, a list of factors necessary to identify the enabling factors for the implementation of TPs for AC in LUs, will be derived from the literature and then investigated in the case study institutions (deductive). After that, the findings from the fieldwork will be incorporated into the existing theory (inductive).

8.3. Research Strategy

Saunders et al (2007) noted that the importance of a having research strategy is that it helps the researcher to answer the exacting research questions and meet the study's aim and objectives.

According to Yin (2009), the five main research strategies, are experiment, survey, archival analysis, history and case study.

Yin (2009) indicates that the case study is the appropriate strategy when 'how' or 'why' questions are being posed. This allows the researcher to determine not only what happened but also why it happened. He also recommends a case study strategy when the researcher has little control over the events and when the focus is on contemporary events. This research will answer the research questions of: why are there no appropriate TPs introduced to the academic staff in LUs; what are the appropriate TPs for academic staff that are implemented in successful universities such as UK universities; what are the barriers that affect the implementation of these programmes; and How do these barriers affect the implementation of TPs in LUs. The event is contemporary and the researcher has no control over this phenomenon.

One of the strengths of the case study strategy is that it allows the researcher to use a variety of sources and a variety of types of data as part of the investigation (Denscombe, 2003). A case study strategy is appropriate if the researcher wishes to gain a rich understanding of the context of the research and the process being enacted (Saunders et al., 2009; Velde et al., 2004).

Based on the above discussion the case study strategy has been selected to gain the depth of understanding of the information necessary to identify and the enabling factors for the implementation of training programmes for academic staff in Libyan universities.

8.4 Justifications for the choice of a single case study

Yin (2009) provides five rationales for adopting a single case study. According to Yin, (2009) the single case study is an appropriate design when the case rationale is called the representative or typical case. The rationale for choosing Tripoli University (TU) as a single case study is illustrated below:

8.5 Justification of choice of case study organisations

The rationale for choosing (TU) as a case study is because:

TU established and deep-rooted public university in Libya. TU contributes effectively in establishing many universities in Libya by providing consultants and educators who are expert in curriculum, academic administration, and teaching (GSUSM, 2005). Therefore, these collaborations contribute to similarities within all Libyan universities. TU is the largest and most important institute of HE in Libya was founded in 1957 .TU is composed of thirteen colleges (faculties), each college have between 3 to 11 departments with 75423 students and 2035 academic staff members in academic year 2009-2010. TU offers certificates in PGD, MSc. and PhD in different fields. TU is located in Tripoli (Capital of Libya), this location offers the university great opportunity to provide its services to different institutions including public and private organisations, and services such as teaching, research, training, and consultancy (GSUSM, 2005).

8.6 The Research Structure

The research is designed in two main stages: the first is a review of the Literature concerning TPs issues, in order to develop a framework that identifies the factors affecting the implementation of TPs for academic staff in LUs. The second is about the methodology which will be used in this study.

8.7 Data Collection Methods

The method of data collection from respondents is the first step taken in any such study. Yin (2009) stated that there are many forms of data collection such as questionnaires, personal interviews, observational techniques and documentation. The aim and objectives of this research will be achieved by the collection of both primary and secondary data. This will involve three separate activities as follows: Firstly, conducting a review of the literature; secondly, the study will employ a survey questionnaire with some UK universities. This will consist of the students who undertake the Postgraduate Certificate in Higher Education as a training programme, randomly selected sample will be used for a questionnaire survey, which will be completed and returned to the researcher. The data collected through a questionnaire will be supporting the main part of the study to enhance the validity of the research. Thirdly, the researcher will use semi-structured, face-to-face interviews as the main method of data collection and documentation review as the other source of evidence to satisfy the requirements for research validity in Libya. The minister of the HE, the head of TPs, Deans, Departmental Heads, and Lecturers will be interviewed.

It was determined to include all of these levels in order to gain in-depth information and clear perceptions about different aspects of TPs for AS in LUs. At these various levels the TPs were will be evaluated. Covering these levels enhances the validity of the study by getting different points of view. Kvale (1996) declares that there is no fixed number of interview subjects, it all depends on when you find out what you need to know. In the same context, Taylor and Bogdan (1984) define qualitative interviewing as flexible and that there is no need to be specific with the number or the type of participants before starting the research. Based on this premise the researcher will be to interviewing participant without knowing the exact

number, and will continue until most answers become repetitive, and the information is sufficient to achieve the research aim and objectives.

8.8.1 Pilot Studies

It was believed by many experts in the area of research methodology, that the questions provided by the researcher either through interviews and /or questionnaires should be subjected to preliminary test which become known as a pilot Study (Hussey and Hussey, 1997; Sekaran, 2003; Yin, 2009). In this study the researcher will conduct two pilot studies in two stages:

8.8.1.1 First Pilot Study (regarding questionnaire)

This questionnaire is designed to collect information about PGCHE/PGCAP or PG Cert programmes in selected U.K. universities, to clarify the words, designing, filtering the questionnaire and the participants understanding. The researcher conducted one pilot study with six PhD students in Salford University; among them two students are now doing the PGCAP programme in Salford University

8.8.1.2 Second Pilot Study (regarding interviews)

To make the interview questions clear, unambiguous, make sense to the respondents, and to decide a suitable duration for each interview, the researcher will conduct one pilot study with five PhD students who have an experience in university teaching.

8.9. Data Analysis

The data collected from the case study organisations will be analysed according to suitable methods to be decided in advance of the data collection.

9. Conclusion

This paper has reviewed the aim, objectives, questions and expected contribution of this research into the training programmes provided for academic staff in Libyan Universities. It has discussed the HE sector, increasing student numbers, and the lack of qualified academic staff members in Libya. It has also suggested that the low numbers of qualified academic staff in the Libyan HES may be attributed to the loss of qualified and capable professionals to other countries. Furthermore, it has given an outline of the proposed methodology, data collection, and analysis methods. The next stage of this research is to conduct the interviews to collect the data, following which recommendations and conclusions will be made.

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A Strategic Plan for Electronic Learning in Libyan Higher Education

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Abstract

E-learning is defined as learning facilitated and supported through the use of information and communications technology. It has many advantages over traditional learning. The e-learning strategy has been widely applied, as it offers opportunities to learn anywhere without being in a lecture theatre (Yieke, 2005). However, any project that involves change should develop a specific plan of action and include a strategy (Burn and Robins, 2003). However, the need for a strategy in Libyan universities is essential for the effective implementation of E-learning. This paper highlights the aspects of an e-learning project such as: educational objectives; project management; software and appropriate program; training; and strategy of technical support and maintenance that are necessary to develop successful strategies in Libya. The research methodology uses semi-structured interviews with Senior Leader (SL); Heads of Academic Departments (HODs); and Staff members (STM) within two Libyan universities.

The paper suggests that the higher education (HE) sector in Libya needs to have a comprehensive, clear, and specific strategic plan to implement an e-learning programme. The researcher identifies postgraduate programs (with fewer students) as possible pilot study of e-learning system. This is an original approach to studying the strategic plans for the involvement of technology in education in Libyan universities.

Keywords

Attitudes towards e-learning; E-learning; Libyan Higher Education; Information Technology (IT); Libyan strategy.

1. Introduction

Any project that involves change should develop a specific plan of action and include a strategy (Burn and Robins, 2003). According to Rahimnia et al. (2005) today's organisations work in a dynamic, complex environment that continually changes and hence organisations are forced to revisit their strategic planning – and the HE sector is no exception. The HE sector has begun to be aware that strategic planning is necessary in order to maintain its own responsiveness to a rapidly changing environment (Engelbrecht, 2003). Ostar (1989) claimed that colleges and universities have experienced rapid changes associated with old facilities, changing technology, changing demographics, increasing competition, rising costs and funding cuts. Educational administrators are challenged to anticipate changes and to formulate proactive responses that will enhance the educational processes within college and university campuses (Rahimnia et al., 2005).

A successful implementation strategy is vital for any public or private organisation. A strategy will provide institutions within the public sector with specific guiding principles to follow when pursuing electronic development (Ke and Wei, 2004). However there can be a number of problems in strategy implementation, such as weak management roles in the implementation of the strategy, lack of communication, lack of a commitment to the strategy

and a lack of awareness or misunderstanding of the strategy (Giles, 1991; Alexander, 1991; Galpin, 1998; Beer and Eisenstat, 2000). A good strategy needs to firstly map the current condition of the organisation as the first step to developing a path to the desired results. An organisation's Information and Communication Technology (ICT) infrastructure is the first critical element for assessment. (UN/ASPA, 2002).

2. The Higher Education Context in Libya

Libya is an Arab country located in Northern Africa and it covers a land area about 1,759,540 sq km. The capital of Libya is Tripoli and the main language spoken is Arabic. The Italian and English languages are widely understood in the major cities of Libya. The total population of Libya is approximately 5.5 million, of which 1.7 million are students, over 270,000 of whom study at the tertiary level (Clark, 2004). El-Hawat (2004) reported that in the academic year 1975/76 the number of university students was estimated to be 13,418. This number has increased to more than 200,000 of which about an additional 65,000 students have enrolled in the higher technical and vocational sector. The consequence of this rapid increase in the number of students in HE in Libya has resulted in an increase in the number of institutions providing HE. The university sector in Libya started in the early 1950s with the establishment of the "Libyan University". It has campuses in Benghazi and Tripoli and it has grown over the years to incorporate Faculties of Arts and Education; a Faculty of Science, a Faculty of Economics and a Faculty of Commerce, Law, and Agriculture.

Libya has a history of sending university students abroad. In 1978, more than 3,000 students were studying in the United States alone. However, by 2002 that figures had dropped to just 33 as a result of sanctions imposed in 1986 which restricted travel to the United States by Libyan nationals. There is no new published information on storage media on Libya because of the long UN embargo (1993-2003) and the liberation war this year.

3. Sample of Study

This study involved two main universities in Libya, Tripoli University and Az_zawia University (Figure 1).



Fig.1. The two main Universities geographically sites (★)

Each university was visited by the author, conducting face-to-face semi-structured interviews. Direct observation and the collection of supporting documentation was also utilized for

triangulation purposes. The numbers of interviewees in the two case study organisations were 16 in Case Study “A” and 15 in Case Study “B”, see Table 1.

Table 1: Interviewee groups from the two case study organisations

Position of the interviewees	Referred in the findings	Case Study “A”	Case Study “B”	Total each level
Dean of the Faculty, Registrar and Administrative manager	Senior Leader (SL)	3/3 “One from each level”;	3/3 “One from each level”;	6;
Heads of Academic Departments	Heads of Academic Departments (HODs)	6/12;	6/9;	12;
Staff member	Academic staff and administrations’ office (STM)	7;	6;	13;
Total each cases	---	16.	15	31

In this paper the NVivo software version 7 was used for data analysis as it has many advantages. One of the advantages of using NVivo is its ability to lessen the problem of ‘drowning in data’ by allowing data to be separated into categories, which provide a more simple structure for discovering emergent themes (Rowe, 2007). The responses of the thirty-one respondents were captured through the semi-structured interviews and were transcribed, then the factors were selected and coded. The coded factors with their findings were then grouped into families in tree nodes and graphically displayed as networks of relationships.

4. Analysis of attitudes towards major challenges in applying E-learning

In this paper, the attitudes of staff members were identified through data collection. How these attitudes would affect the implementation of E-learning is as follows:

4.1. Leadership support

The transition from traditional delivery methods to the implementation of E-learning environments inevitably involves the management of change (Betts, 1998). The need for support from an organization's leaders in order to begin and maintain any new approach to learning is addressed in the works of Abdelraheem (2006) and McPherson and Nunes (2006). Moreover, Liaw et al. (2007) went further by stating “instructors' leadership is a crucial factor to affect learners' attitudes to implement E-learning”. If leadership fails to understand currently emerging futuristic technologies and their potential to develop a vision and strategy to support and enhance learning, acceptance of E-learning will be slow if not impossible (Minton, 2000).

From the viewpoint of the interviewees commitment and support by the leadership is one of the most important factors. The adoption of a new way of doing business or of a new technology is unlikely to succeed if it does not have widespread organizational support, and especially if it does not have acceptance from the leadership. The project that has considerable support gives the people who are working on implementing the project more confidence that the project will proceed to a successful conclusion. This study concluded, after analysis, that leadership support is an important factor for e-learning implementation in the Libyan Higher Education.

This study concluded that SL support is important for all e-learning implementation stages. Furthermore, HOD and STM can play a major role in the implementation of e-learning initiatives. The positive commitment, enthusiasm and support from all three levels for the implementation of e-learning are crucial for both Faculties and Universities to deal effectively and efficiently with new concepts, processes and/or technologies. This factor has been reported by many authors (among them Nunes (2006). Participants from the two categories (HOD and STM) have acknowledged that previous projects had been successful when supported by a senior leader.

4.2. Technological infrastructure

Lack of public awareness on ICT and weak data communications infrastructures are two of the main factors affecting E-learning (Karmakar and Wahid, 2007). An organization that wants to implement E-learning should attain at least the minimum hardware requirements and the software required. The hardware part of E-learning includes the physical equipment that must be present to supply E-learning, e.g., servers and networks (O'Neill et al., 2003; Ettinger et al., 2006). O'Neill et al. (2003) suggested that the success of the technological infrastructure also has implications for the success of virtual learning; malfunctioning hardware or software can both be barriers which can cause frustration and affect the learning process. Valentine (2002) agreed with O'Neill et al. that hardware and tool malfunctions can be greatly detrimental to the effectiveness of E-learning.

Another important factor covered within this paper is the required technology infrastructure to implement E-learning in Libyan higher education. The data from the interviews revealed that interviewees in Case "A" (with a reasonably established infrastructure) were willing to implement E-learning initiatives; while interviewees in Case "B" (which lacked appropriate infrastructure) wanted to participate in the implementation of E-learning initiatives. To be successful such a programme needs to have an infrastructure that is capable of supporting and enabling the execution of E-learning.

Therefore, this paper suggests that the Higher Education in Libya needs to have in place good quality technology in all universities. At the moment in terms of technology there is a dissimilarity between the two case studies; for example, Case Study "B" has shortages of computers despite the fact that they have a plan to fully computerize the university as a part of their effort to develop a technological culture which encourages and promotes the use of technology in day-to-day activities and tasks.

4.3. Funds

The consideration of the initial cost as well as the continuing costs of installing, maintaining, using and upgrading technology, and the human capital costs to support E-learning, is very important (Valentine, 2002). Marengo and Marengo (2005) demonstrated that the costs of technological infrastructure include digital content costs, maintenance costs, content hosting costs, hardware and software costs and costs of E-learning staff. Staff costs include tutoring costs, administration and management costs and Expert in Multimedia Technology (ETM) costs. In addition, Marengo and Marengo (2005) stated that, in cases where the hardware and software supplied by the faculty to circulate the contents (software, document, etc..) are not sufficient, the E-learning evaluation needs to take into account the cost of items, such as the purchase of a server and its relative software. The lack of money can be problematical for the implementation of E-learning particularly with the continuous labour costs of instructors (Cho and Berge, 2002; James-Gordon et al., 2003; Berge and Muilenburg, 2006).

The majority (87.5%, 14) of the interviewees agreed that the university has enough financial resources to cover the expenses and technical requirements of adopting and providing E-learning (Figure 2). The author found in the interviews that this factor was not of significance to the interviewees. They confirmed that the entire funding for any project comes from a single source; that the government is based on political decision-taking and thus if the universities decide to adopt E-learning, there would be no problem in funding. Only one STM from Case Study “A” responded ‘don't know about the availability’ in answer to this particular question.

Most of the interviewees stated if they wanted to request anything the university is able to afford it. One senior leader from Case Study “A” and another one in the same position in Case Study “B” reported that if a decision is taken on the adoption and implementation of any project, such as E-learning for example, it will be passed together with a budget from the finance sector and that a decision on E-learning implementation must come from the General People’s Committee of HE. The author agrees that this is the system in Libya in all public sectors.

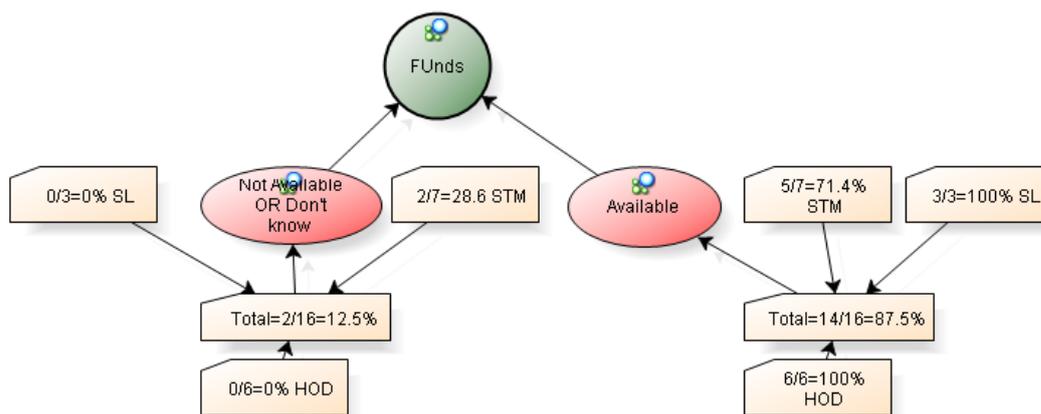


Fig. 2. CSA: Number of respondents who confirmed that funding could be made available.

4.4. Resistance to changes

Resistance to change is one of the important factors affecting the implementation of E-learning (Minton, 2000; Cho and Berge, 2002; Berge and Muilenburg, 2006; Ettinger et al., 2006). This resistance to change in some countries is usually because of the high percentage of illiteracy in those countries (Karmakar and Wahid, 2007). Moreover, Habibu (2003) stated that resistance to change is one of the factors that should be considered when implementing E-learning. It relates particularly to non-technical issues which includes academic staff, administrators, and/or managers. This resistance can be divided into three main reasons: fear of ICT; lack of time to design, develop and maintain support for online classes’ materials, and fear of exposing the quality of work. Lecturers are one of the major factors that contribute to the success of E-learning. For lecturers, implementation of E-learning programmes represents a change in teaching style and materials. The precise nature of the change is difficult to quantify (O'Neill et al., 2003). O'Neill et al. (2003) stressed that human resources should be committed to the project at an early stage and lecturers should be selected based on their attitude towards technology. According to Liaw et al. (2007) personal attitude is a major factor affecting usage of IT. Understanding a user's attitudes toward E-learning facilities is important for the creation of appropriate E-learning environments for teaching and learning.

The acceptance and implementation of electronic learning involves altering human behaviour and activities. The majority of the respondents (81.3%) agreed that there is a natural resistance to change for different reasons.

In the two case studies, Case Study “A” and Case Study “B”, the majority agreed that the reasons for resistance to change are a lack of time, fear of technology and fear that the staff member is exposing the quality of their work. But some of respondents added other reasons which were: fear of losing their jobs, fear of using the English language and time pressures on their work load.

4.5. *Staff education/training*

One of the most challenging factors for STM and universities around the world is technology and the need for continuous training for keeping up-to-date with advanced technology.

Staff education and knowledge is another important factor for the successful adoption of E-learning systems, University staff members need to be aware of the need to continue learning and to utilise IT technological infrastructures to acquire and manage knowledge. Training to use E-learning systems will ensure that they can utilise the full potential and capabilities offered by ICT tools. If universities provided staff with adequate and quality training to facilitate the use of technology and E-learning systems then staff would, in all probability, find E-learning systems easy to use. It is important that universities promote and educate staff to use E-learning systems rather than forcing them to do so.

4.6. *Technical expertise*

Lack of personal technological expertise in solving technical problems is one of the main factors affecting an E-learning programme (O'Neill et al., 2003; Berge and Muilenburg, 2006). Valentine (2002) added one overlooked factor in the success or failure of E-learning programmes, i.e. the role that technicians play in E-learning.

The author noted in the findings that there were disparities between Case Study “A” and Case Study “B”. In Case Study “A” it was noted that the most of the answers from SL, HOD and STM indicated that they have some professionals who undertake the maintenance of equipment (for example, computers) and that they also have some expertise in programming, multimedia technology and experts in information technology, and project management. In Case Study “B” most of the answers from the interviewees indicated that there was a shortage of such professionals who can maintain equipment such as hardware and multimedia technology; there was also a shortage of specialists in software programming such as project management and information systems.

4.7. *Strategy*

From the findings, the setting up of a strategy was found to be an important factor for the implementation of E-learning in the Libyan Higher Education. These findings will be discussed thoroughly in the next paragraph:

5. Findings and Analysis of the Case Studies’ Strategic Plans

The question posed to the interviewees were open ended such as: “What is the University’s strategy for electronic learning implementation?”

The feedback from interviewees in Case Study A and Case Study B (Figure 3) identified that a strategy for the implementation of e-learning in Libya was non-existent Figure (3) shows the transcripts of availability of a strategy for implementing electronic learning in Libyan HE. This was mentioned by SL (100%), HOD (83%) and STM (71%) in Case Study A, and SL (67%), HOD (83%) and STM (100%) in Case Study B. One of the STM stated that the technology is available and that the adoption of e-learning should be a part of the general university strategy. Another interviewee was concerned about strategy and about the prioritisation by the senior leadership in getting budgets for employing ICT. Another HOD pointed out that, despite the conviction by the leadership and top management that there is a need for such a strategy, the absence of a clear strategy is an obstacle. This finding does not match those found in the literature. McPherson and Nunes (2006) stated that leaders must be convinced of the benefits of e-learning in order to drive the strategy forward within their institutions.

Similarly the outcomes from the case studies do not match with the beliefs of Minton (2000) who stated that leaders should be obliged to implement emerging futuristic technologies and that they (ie, the leadership) are the ones with the potential to develop a vision and a strategy to enhance technology in learning.

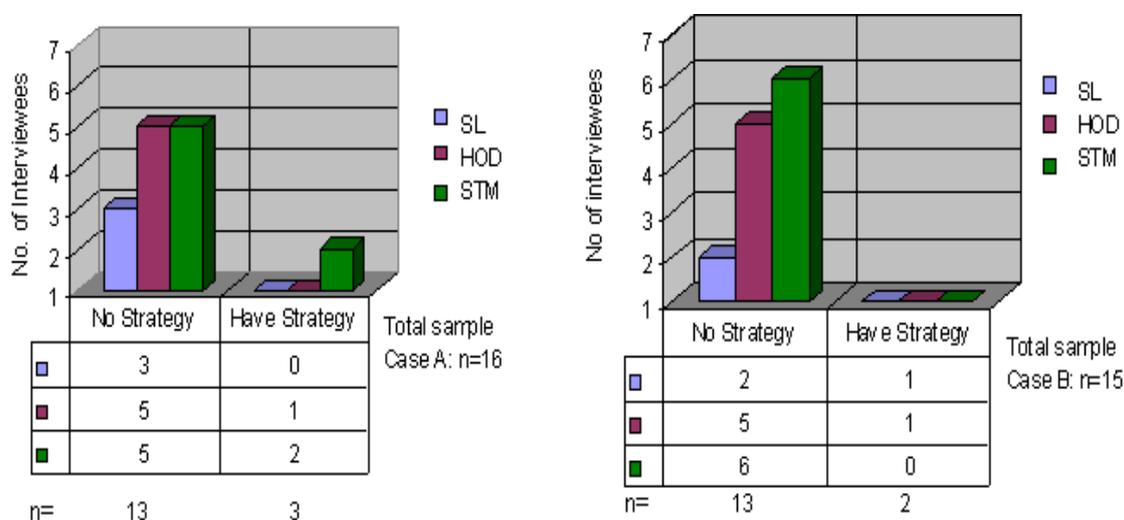


Fig. 3. Availability of a strategy for implementing electronic learning in Libyan HE.

The HE public universities in Libya need to create a roadmap that can ensure the adoption and implementation of short and long-term e-learning initiatives. As such the universities must have clearly defined strategic plans that spell out e-learning policies and implementation strategies. The strategy plan has to be established within each university to enable the staff involved to work toward realizing the goals and objectives of the programme. Colleges, faculties and departments must also have strategic plans that fit into the university-wide strategic plan, will guide their own e-learning adoption and implementation.

The strategy (see Figure 4) encompass: educational objectives for e-learning which must drive the whole initiative for implementation; project management and educational management objectives for executing appropriate investigations, reports, and studies aimed at determining the potential and capabilities of the current technological tools available based on assessing the needs of each individual faculty (as the availability of technology

infrastructure and platforms can vary dramatically from one department to another and from one faculty to another as in Case Study A and Case Study B); software and appropriate programmes must be in place for basic ICT literacy skills, for the integration of ICT across faculties and for ICT as a subject in itself (e.g. computer science); the wider strategy for the technical support and maintenance of IT must be monitored and evaluated regularly to make suitable and quick adjustments and to keep equipment, tools and hardware operational. In this context the strategy should contain the establishment of support for an Information Technology Centre for e-learning systems, such as services, training and support plans for the success of e-learning in Libya.

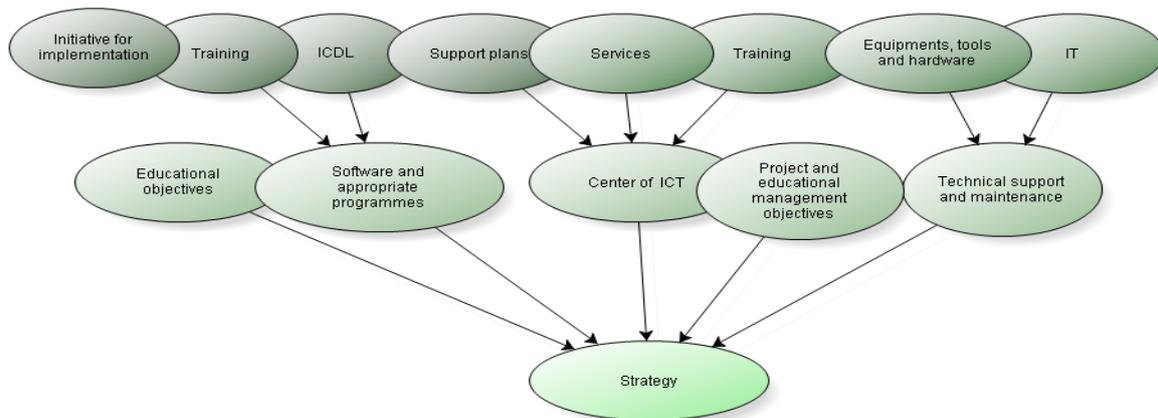


Fig. 4. Components of a strategy for Libyan HE

Training and usage support for comprehensive e-learning-related programmes must be undertaken to address the ways in which e-learning is to be implemented.

The ICT centre should also respond to the training needs of each HE university with particular regard to e-learning and should implement a clear plan for training in order to increase the capacity and development of staff knowledge and skills. This training should include technology especially training on computer skills, should introduce the International Computer Driving Licence (ICDL) and the internet and it should include training in the English language. If staff gained more knowledge, skills and experience of technology and became more ICT literate, then they would be more prepared to use such electronic learning programmes.

The ICDL exists to assist individuals in performing their work and duties by using computers and undertaking the required tasks. The ICDL system encompasses seven training units: the basic concepts of information technology; using a computer and managing files; word processing; spreadsheets; databases; presentations, and information and communications. ICDL courses provide trainees with a solid foundation of basic skills to help them use computer skills efficiently and with full confidence. This is especially useful for the older generation staff. New computer users and staff with a poor knowledge of the English language can be trained on the Arabic version of ICDL.

In addition, there is a need for a strategy to utilise training abroad if it is not available in Libya in order to increase the effectiveness of staff in the use of technology and to increase their technical skills so that they can be technically qualified.

ICT training in Libya should have a strategy which concurs with other strategies and which encourages staff through a motivation and reward system.

Therefore, this study suggests that Higher Education in Libya needs to have a comprehensive, clear and particular strategic plan to implement an e-learning programme. Postgraduate programmes (with fewer students) could be used as pilot studies of the e-learning systems after the e-learning strategy has been introduced.

This study has concluded that a strategy has to be established within each faculty to enable all participants and staff (not only staff from SL) to work towards realizing the goals and objectives of such a programme and to ensure that they work towards achieving the essential goal of implementing e-learning.

There was no clear policy or strategy for either of the case studies (Case Study A and Case Study B) in the adoption and implementation of e-learning and the researcher has concluded that each of these faculties must develop a clear strategy aimed at the adoption and implementation of e-learning.

6. Conclusion

Firstly, the Higher Education sector in Libya needs to have a complete strategy plan to implement e-learning programmes with specific guiding principles to follow in order to encourage e-learning development and it should submit a draft to the universities of the proposed e-learning strategy, so that they (the universities) can commence preliminary steps to implement e-learning and encourage strategic projects in Libya HE. The strategy should encompass project management and educational objectives; technology infrastructure, training and usage support; comprehensive e-learning-related training programmes and a strategy for technical support and maintenance.

Furthermore, Libyan HE should establish an independent training department to unify the training strategy in order to implement such a programme and to determine training objectives, needs and types, to provide quality training, and to select targeted individuals and assess the quality of trainees for e-learning.

This study has concluded that, in order to develop successful strategies, it is necessary to cover every aspect of an e-learning implementation project. The successful implementation of a strategy will require the engagement of all academic staff with e-learning technologies that enhance teaching and learning.

The failure of the Libyan HE sector to accept and develop a vision and strategy to understand the current emerging advanced technologies will seriously undermine any potential to implement the e-learning process. As a result, there should be a training strategy which should be addressed early in the implementation alongside other strategies and should encourage STM through a motivation and reward system.

This paper has contributed to the discussion concerning a strategic plan for implementing electronic learning in Libyan Higher Education.

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Vocational Education and Training and Employability: the case of the Government Vocational Training Centres in the Sultanate of Oman

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Abstract

The Vocational Education and Training (VET) sector is considered to be at the heart of the domestic and worldwide economies and it plays a major role in the provision of people's employability. In Oman, throughout all the stages of the Five Year National Development Plans (1976 –to date), Government Vocational Training Centres (GVTCs) have received the government's attention. This includes the expansion and development of premises, construction works, workshops and the provision of machinery and tools, to keep abreast of VET developments witnessed by various economic sectors in the country. Thus, it is clear that Oman attaches great importance to VET, as it represents a central focus of its development strategy. However, despite this evident government support there are several indications that a negative attitude towards vocational work from some Omani youth may also exist, further adding to a general reluctance to join GVTCs and a scarcity of Omanis in the industrial labour force. Within this context, this research aims to develop a framework that enhances the GVTCs' graduate's skills in Oman by identifying the current status of VET programmes, investigating graduates' employability, and analysing the challenges that face trainees and graduates in GVTCs and the market place.

Keywords

Government Vocational Training Centres, Research Design and Methodology, the Sultanate of Oman, Vocational Education and Training.

1. Introduction

Vocational Education and Training (VET) is considered to be at the heart of the domestic and worldwide economies and it plays a major role in the provision of an employable workforce to supply the global labour market (Al Lamki, 2008). In Oman, from 1976 to the present day Government Vocational Training Centres (GVTCs) have received the government's attention. Continual support for VET and employment improvement has been a steady theme addressed by His Majesty Sultan Qaboos, who, in 2006, said:

As we urge the Omani youth to take advantage of opportunities for education, training and employment available, we would like to draw everyone to call attention to repeated human resources education and training and to encourage workers to take an interest in this vital issue which we consider to be the cornerstone for building the future and a major catalyst for success in achieving the goals we seek and the goals we aspire to achieve (Shura Council, 2009:4).

Thus, this paper aims to develop a framework that enhances the GVTCs' graduate's skills in Oman by identifying the current status of VET programmes and investigating the graduates' employability. This paper also analyses the challenges that face trainees and graduates in GVTCs and the market place, as well as several development procedures that can be used to address these challenges.

2. Background of the Sultanate of Oman

The Sultanate of Oman is the second largest country in size and population in the Arabian Peninsula, with about 309,000 square kilometres (MoI, 2007). The country's economy is dominated by oil and the total GDP is \$35.7 billion (MoNE, 2007). According to official sources, the population of Oman is estimated at 2,743,000 (MoNE, 2008). The people of Oman are predominantly Muslim, and Islam has given Omanis their religious character and provided them with a political and legal system upon which the foundations of their society are based (MoI, 2007). The official language in Oman is Arabic with English as a second language.

2.1. The current status of VET in Oman

In Oman, VET in GVTCs is supervised by the Ministry of Manpower. Three levels of vocational qualifications are offered in these centres, constituting a three-year programme (see Figure 1). Additionally, there are nine programmes: Electronics, Mechatronics, Electrical Wiring, Refrigeration and Air Conditioning, Auto Mechanic, Fabrication Welding and Sheet, Metal Carpentry, Mechaning Maintenance and Construction. Trainees who complete grade ten at school can join the first-year programme in the GVTCs, whilst those who complete grade eleven or twelve can join the second-year programme (MoMP, 2010a). To make the system more flexible and to enhance trainees' opportunities in finding jobs, trainees in GVTCs can leave the centre after completing any level and they can also come back to continue their studies after spending some time working in industry (Masri, *et al.*, 2010). In addition, distinguished graduates from these centres are now allowed to attend a one-year bridging programme, first implemented in 2008 (MoMP, 2009b) and equivalent to the foundation year in the Technology Colleges.

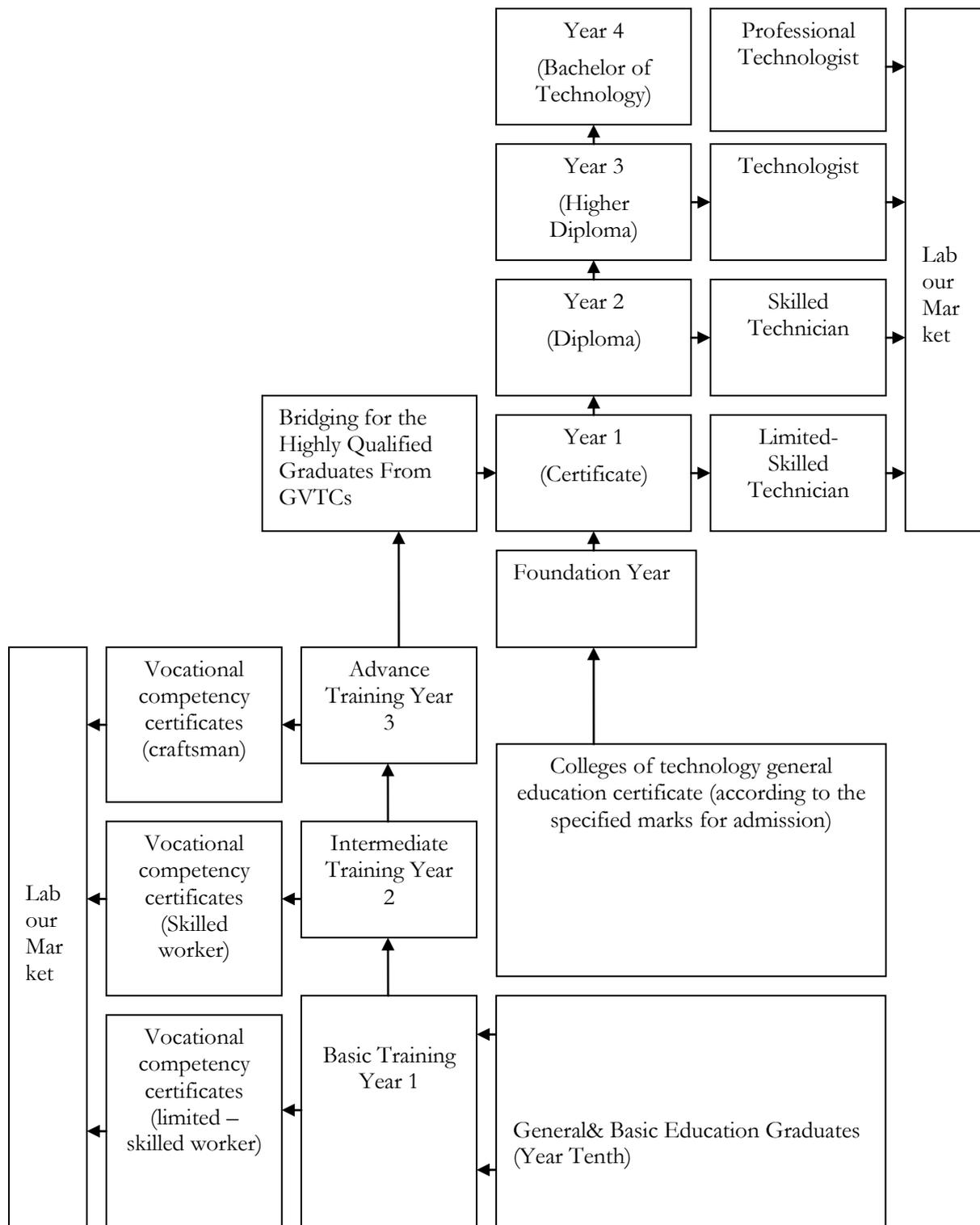


Figure 1: VET and Technical Education stages in Oman (MoMP, 2010a: 24)

2.2. *Employment in Oman*

In Oman, there are two working sectors. The first sector is the government sector which is referred to as the public sector and the second one is the private sector. There are several differences between these two sectors, in many aspects. The government sector contains whole ministries and authorities which depend upon the government supply of their budget represented by the Ministry of Finance. Whereas, the private sector depends upon individuals forming company capital. In terms of administration, the Omani government sets some rules for the private sector. For example, each employee in the private sector has to be aware of the Omani labour law which is announced by the MoMP under the royal decree number (35/2003) and contains everything about work ethics in the private sector (MoMP, 2009a). Also, recently, the government has been working towards an Omanization policy, whereby companies are restricted by the government to having certain percentages of Omani workers.

Employment in the government sector is controlled by the Ministry of Civil Services. However, employment in the private sector depends upon the companies adopting the labour law announced by the MoMP. Moreover, pension funds for the public and private sectors are controlled mainly by the government. For example, all of the ministries are working under the Ministry of Civil Services pension fund rules and some other government authorities have their own pension funds. However, all of the private companies are required to join social insurance authorities where the chairman of the board of directors is the Minister of MoMP.

3. Statement of Research Problem

The support of the MoMP towards VET is evidenced by the rise in the number of trainees in GVTCs, as figures show that from 1,633 trainees in the academic year 2000-2001, the number rose to 4,114 trainees in 2009-2010 (MoMP, 2010b). From these figures it can be understood that in the last academic year for which trainees' enrolment numbers are available (2009-2010), the GVTCs produced almost 4,114 graduates who could have had the potential to supply the Omani labour market (see Table 2).

However, despite this evident government support, figures show that the level of unemployment of graduates from GVTCs in 2008-2009 was over 74% (MoMP, 2010c: 4). Moreover, there are several indications that a negative attitude towards manual work from some Omani youth may also exist, further adding to a general reluctance to join GVTCs and a scarcity of Omanis in the industrial labour force (MoMP, 2010b).

Table 1: Number of Trainees in GVTCs in Oman 2000-2010

Center	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	2006/ 2007	2007/ 2008	2008/ 2009	2009/ 2010
Al Seeb	513	563	633	602	613	572	548	630	629	842
Saham	353	286	437	404	428	466	751	855	1023	1376
Sur	349	299	443	460	548	508	592	466	467	543
Ibri	418	493	463	485	502	454	435	420	424	659
Shinas	0	0	0	0	0	0	0	0	257	364
Al Khabou rah	0	0	0	0	0	0	0	0	129	112
Salalah	0	0	0	0	0	0	0	0	0	218
Total	1633	1841	1976	1951	2091	2000	2326	2371	2929	4114

4. Literature Review

In this section, the study will explain some conceptual and theoretical considerations related to VET and employability.

4.1. Some Conceptual and Theoretical Considerations of VET

4.1.1. Definitions of VET

Cooley (1915: 15) defines VET as "... training which will enable people to make the most of themselves as workers, citizens and human beings. Although its overall dimensions include social education and labour force considerations, its basic concern is for the people who provide the services required by society". Furthermore, Calhoun and Finch (1982: 22) argue that "VET is a programme to prepare people for work and improving the training potential of the labour force. It covers any form of training or re-training designed to prepare people to enter or continue in employment in a recognised occupation". VET is a strategic activity, having several purposes, and not merely intended to prepare people for specific jobs, but also for helping the unemployed, reducing the burden on higher education, attracting foreign investment, ensuring rapid growth of earnings and employment, reducing inequality of earnings between the rich and the poor, and others, all identified as being present in different countries (Rahimi, 2009). This study defines VET as the practical activities, vocational skills and specific knowledge which are provided by GVTCs in Oman to prepare trainees and qualify them for admission into the labour market for specific jobs, trades or occupations that are based on manual work (MoMP, 2008).

4.1.2. VET Models

VET models differ depending on the occupation, the organising principle for labour markets and the company work organisation. Education International (2009) suggests four models:

The first model, 'Direct Transition' is based on the Japanese situation and does not contain an organised 'bridge' between school and employment... The second model, 'Hardly Regulated Transition', is based upon the typical situation in the UK, which arises in a lesser extent in Italy and Spain. The model is characterised by a relatively long and lightly regulated transition phase with extensive search and orientation processes for youths. The third model, 'Regulated Overlapping Transition', is based upon central European countries such as Austria, Switzerland, Germany and Denmark. The transition from school to work takes place via a regulated system of apprenticeship. The fourth and final model, 'Shifted Transition', is based upon countries with a well developed, school-based state-provided vocational training system (Education International, 2009: 12-13).

From the above explanation, it can be said that the first model has extra training and it offers independently chosen employment in large companies, and this type of training is described as successful because of a high company loyalty and high work morale (Rauner, 1999: 3). However, the second model is accompanied by a high rate of youth unemployment and other social risk situations and the participation in training programmes is closely linked to entry into the employment system and commencement of gainful employment can be a temporary solution during one's job search (Grollman and Rauner, 2007: 2-6). Furthermore, the third model has the young person as a trainee, a student in a vocational school, and as an employee simultaneously working in a company with the status of an apprentice (*ibid*). In this model, youth employment is low as VET acts as a bridge between the working world and the education system (*ibid*). Finally, the fourth model is completion of general education and it is followed by a vocationally-related or vocationally-oriented form of schooling (*ibid*).

4.2. Some Conceptual and Theoretical Considerations of Employability

4.2.1. The Concept of Employability

A review of the literature suggests that employability is about work and the ability to be employed. Hillage and Pollard (1998) and Gibbs (2000) argue that employability is the ability to gain initial employment; hence, the interest in attaining key skills, careers advice and an understanding about the world of work are embedded in the education system; the ability to maintain employment and make transitions between jobs and roles within the same company to meet new job requirements; and the ability to obtain new employment if required. Brown and Hesketh (2004: 16) define employability as “.. *the relative chances of getting and maintaining different kinds of employment..and employability not only depends on whether one is able to fulfil the requirements of specific jobs, but also on how one stands relative to others within a hierarchy of job seekers..*”

4.2.2. Employability Skills in VET

Employability skills are linked to trainees' capacities to perform and advance within a particular organisation's operative strategic direction and they address the demand for skills

in a global economy, so VET is better able to respond to labour market demands and trainees' needs (Sheldon and Thornthwaite, 2005). The British Council (2010) has focused on employability skills for building strong relationships with industry and employers, governments and VET providers, using the UK's expertise on standards, innovation and creativity in the field of VET. Some employability skills are emphasised by Curtis and McKenzie (2001: 12–15), AI Group (1999: xi, 31) (see Table 3)

Table 2: The Required Employability Skills

<i>Skill group</i>	<i>Employability Skills</i>
<i>Basic or core skills</i>	<ul style="list-style-type: none"> • <i>Problem-solving</i> • <i>Initiative and enterprise</i> • <i>Planning and organising</i> • <i>Self-management</i> • <i>Ongoing learning capability</i> • <i>Information Technology capability</i> • <i>Occupational health and safety knowledge</i>
<i>Inter-personal Skills</i>	<ul style="list-style-type: none"> • <i>Communication</i> • <i>Teamwork</i>
<i>Personal Attributes</i>	<ul style="list-style-type: none"> • <i>Loyalty</i> • <i>Commitment</i> • <i>Honesty and integrity</i> • <i>Enthusiasm</i> • <i>Reliability</i> • <i>Personal presentation</i> • <i>Commonsense</i> • <i>Positive self-esteem</i> • <i>Sense of humour</i> • <i>Balanced attitude to work and home life</i> • <i>Ability to deal with pressure</i> • <i>Motivation</i> • <i>Adaptability</i>

4.3. Some Challenges relating to employability of graduates in VET

In this section, the most common challenges which affect employability of trainees and graduates in VET are considered, as identified from a review of the literature. Firstly, despite the social change in developing countries, many social attitudes are often legacies of the past, which still hinder the development of VET, especially regarding manual work (Ali, 1999; Al Marzooki, 1994). Secondly, a lack of vocational guidance, and counselling regarding employability skills that lead to low levels of enrolment in vocational jobs in the labour market (Al Ghamdi, 1994; Al Bonyan, 1991).

Thirdly, during the last decade, due to the rising level of unemployment of VET workers among home nationals, other difficult economic and political issues have arisen leading to in some GCC countries, more concrete policies for enhancing indigenisation and reducing the numbers of foreign workers (Samman, 2010). Finally, in some developing countries, it is apparent that the practical application of academic subjects is lacking (*ibid*). This reflects the fact that education in the earlier stages is theoretical and does not serve developmental goals, and also students' preference for theoretical academic education over practical subjects (*ibid*). This feature is a common characteristic among developing countries, where there is a large surplus of graduates from universities and other academic institutions and GVTCs (Tilak, 2002).

5. Research Methodology

Research methodology refers to the choice and use of particular strategies and tools for data gathering and analysis (Aouad, 2009).

5.1. Research Philosophy

The philosophy to be adopted and the research process were influenced by two main perspectives: ontology and epistemology. Ontology is concerned with the nature of reality, and it has two aspects: objectivism and subjectivism (Sutrisna, 2009). Objectivism states that the social world exists independent of humans, while subjectivism insists that phenomena are created from the perceptions and consequent actions of social actors (Saunders *et al.*, 2009; Bryman and Bell, 2007). Epistemology, meanwhile, “*is the researcher’s view regarding what constitutes acceptable knowledge*” (Saunders *et al.*, 2007: 119). Epistemology is concerned with the claims of what is assumed to exist and it has two common research philosophies in social sciences; positivist and phenomenological (Saunders *et al.*, 2007; Collis and Hussey, 2009).

In phenomenology, it is unlikely to obtain the same results when replicated and has some kind of bias because of the interaction between researcher and people being studied (see Table 4). Therefore, for two reasons, the researcher chose phenomenology as a philosophy for this study. Firstly, the nature of this research is social and it needs to deal with beliefs, attitudes, experience and aspects of people. Secondly, the researcher is involved in the context of the research which refers to the subjective aspects of human activity, focusing on meaning rather than measurement.

Table 3: Contrasting Implications of Positivism and Phenomenological

	<i>Positivism</i>	<i>Phenomenological</i>
<i>The observer</i>	<i>Must be independent</i>	<i>Is part of what is being observed</i>
<i>Human interests</i>	<i>Should be irrelevant</i>	<i>Are the main drivers of science</i>
<i>Explanation</i>	<i>Must demonstrate causality</i>	<i>Aim to increase general understanding of the situation</i>
<i>Research progresses through</i>	<i>Hypotheses and deductions</i>	<i>Gathering rich data from which ideas are induced</i>

<i>Concepts</i>	<i>Need to be operationalised so that they can be measured</i>	<i>Should incorporate stakeholder perspectives</i>
<i>Units of analysis</i>	<i>Should be reduced to simplest terms</i>	<i>May include the complexity of whole situations</i>
<i>Generalisation through</i>	<i>Statistical probability</i>	<i>Theoretical abstraction</i>
<i>Sampling requires</i>	<i>Large numbers selected randomly</i>	<i>Small numbers of cases chosen for specific reasons</i>

Source: Easterby-Smith *et al.*, (2002: 30)

5.2. Research Approach

The deductive approach is described as a theory-testing process, while the inductive approach is a theory-building process, starting with direct observation of specific instances and seeking to establish generalisations about the phenomenon under investigation (Al Mansuri *et al.*, 2009) (see Table 5). Thus, the inductive approach was employed.

Table 4: Differences between Deductive and Inductive Approaches

Deductive	Inductive
<i>Scientific Principles</i>	<i>Understanding the meaning of human activity</i>
<i>Moving from theory to data</i>	<i>Moving from data to theory</i>
<i>The need to explain casual relationships between variables</i>	<i>A close understanding of research context</i>
<i>The collection of quantitative data</i>	<i>The collection of qualitative data</i>
<i>A highly structured approach</i>	<i>A less structured approach</i>
<i>Researcher independence of what is being researched</i>	<i>A realisation that researcher is part of the research process</i>
<i>The necessity to select samples of sufficient size in order to generalise conclusions</i>	<i>Less concern with the need to generalise</i>

Source: Sutrisna (2010)

As regards qualitative and quantitative approaches, Amaratunga *et al.*, (2002) stats that qualitative research is a source of well-grounded rich descriptions and explanations of processes in identifiable local contexts; an exploratory data of people's written or spoken words and observable behaviour, as opposed to prediction (see Table 6). In qualitative research, it implies that the data are in the form of words as opposed to numbers; these data

are normally reduced to themes and categories and are evaluated subjectively. The nature of this research lends itself to the qualitative approach as it is more powerful for gaining insights into peoples' perceptions.

Table 5: Key features of qualitative and quantitative research

<i>Qualitative</i>	<i>Quantitative</i>
<i>Uses small samples</i>	<i>Uses large samples</i>
<i>Concerned with generating theories</i>	<i>Concerned with hypothesis testing</i>
<i>Data is rich and subjective</i>	<i>Data is highly specific and precise</i>
<i>The location is natural</i>	<i>The location is artificial</i>
<i>Reliability is low</i>	<i>Reliability is high</i>
<i>Validity is high</i>	<i>Validity is low</i>
<i>Generalise from one setting to another</i>	<i>Generalise from sample to population</i>

Source: Hussey and Hussey (1997: 54)

5.3. Research Strategies (Design)

Oates (2006) suggests some criteria to be considered when choosing a research strategy, such as the type of research question posed, the researcher's beliefs and values, the extent of control the investigator has over the actual behaviour event, and the degree of the focus on a contemporary event. Yin (2009) mentions five different types of research strategies in social science, which include: experiments, surveys, histories, analysis of archival information and case studies (see Table 7). He points out that the case study strategy is suitable for examining on-going contemporary phenomena; it is an appropriate strategy when the researcher has little control over events, and it also allows the researcher to focus on a specific instance to attempt to identify the various interactive processes at work (*ibid*). Thus, the case study strategy was employed.

Table 6: Relevant situations for different research designs

<i>Strategy</i>	<i>Form of research question</i>	<i>Requires control of behavioural events</i>	<i>Focus on contemporary events</i>
<i>Experiment</i>	<i>How, Why?</i>	<i>Yes</i>	<i>Yes</i>
<i>Survey</i>	<i>Who, What, Where, How many, How much?</i>	<i>No</i>	<i>Yes</i>
<i>Archival analysis</i>	<i>Who, What, Where, How many, How</i>	<i>No</i>	<i>Yes/No</i>

	<i>much?</i>		
<i>History</i>	<i>How, Why?</i>	<i>No</i>	<i>No</i>
<i>Case study</i>	<i>How, Why</i>	<i>No</i>	<i>Yes</i>

Source: Yin (2009: 8)

5.4. Data Collection Methods

This research used three methods: there were three semi structured interviews, a focus group and collection of documentation (see Appendix A: the interview questions). The interview method usually permits much greater depth than the other methods of collecting research data (Borg and Gall, 1983). Furthermore, Best (1981: 164) states that, *"with a skilful interviewer, the interview is often superior to other data-gathering devices. One reason is that people are usually more willing to talk than to write"*. He further adds that *"the interview is, in essence, an oral questionnaire. Instead of writing the response, the interviewee gives the needed information verbally in a face-to-face relationship"*. Additionally, focus group research is defined as a method of collecting data, in a safe environment, from more than one individual at a time, regarding a specified area of interrogation (Krueger & Casey, 2000). Furthermore, Sekaran (2003) points out that a focus group can yield fairly dependable data within a short time. The major advantage of the focus group is that it provides an insight into the function of group/social processes. Focus group activities encourage better selection of communication from participants of the group (Kitzinger, 1999). Moreover, using documentation relating particularly to VET in Oman, a clear picture of the status of VET was obtained. Documentary information is a research method that many qualitative researchers consider meaningful and useful in the context of their research strategy (Mason, 2004). Furthermore, Yin (2003: 87) states that *"the most important use of documents in case study research is to corroborate and augment evidence from other sources"*.

Regarding the number of interviews required for qualitative or case study research, Sutrisna (2010) explains that there are no rules governing sample size in qualitative research, it depends on the purpose of the study and the time and resources available. Accordingly, the total number of interviewees in this research was 93 which include interviews with the five directors of GVTCs in Oman: Al Seeb, Saham, Sur, Ibri, Shinas; 4 trainers; 14 administrators; 36 trainees and 30 graduates.

5.5. Data Analysis

Data was analysed using thematic analysis as it offers a useful and flexible approach to analysing and producing rich and detailed qualitative data (Braun and Clarke, 2006). Braun and Clarke (2006) propose six main phases for analysing data through the thematic method. Firstly, it starts by data familiarisation that involves transcribing data, reading and re-reading, and making notes. Secondly, it involves generating initial codes and collating data relevant to each code. Thirdly, themes must be found and codes created according to the theme. Fourthly, these themes are reviewed and then given names, so that a thematic map of the analysis can be generated and finally, themes are given names. Then, a report is produced that is linked to the research questions and literature.

6. The Main Findings

6.1. Challenges faced by VET trainees and graduates

The findings reveal that all the interviewees in GVTCs (Al Seeb, Saham, Sur, Ibri, Shinas) agreed that the trainees and graduates in these centres face several challenges. The table below shows these challenges from the different groups of interviewees.

Table 7: Challenges faced by VET trainees and graduates in all GVTCs

Interviewees	Challenges
<p style="text-align: center;">Directors and Administrators and Trainers</p>	<ul style="list-style-type: none"> • The VET programs do not fulfil the needs of the job market because the specialized instructors prepare for the programs and curriculum and the course subject without sharing it with the heads of department at the centres; • Some private companies collaborate only through special relations and they have limited abilities to provide training opportunities for trainees; • A vocational certificate is not classified to a financial degree and there is no coordination to equal this certificate financially; • Lack of contact between Department of Employment in the Ministry of Manpower, the Vocational Centres and private companies, • Low salaries and wages in the private sector for those who graduate from GVTCs; • Lack of financial awards ; • The graduates have a lack of experience in facing work problems in the labour market; • Some graduates lack important and necessary skills; • The lack of family encouragement for those graduates; • Some graduates' productivity is low; • The job environment in the private sector frustrates graduates and discourages them to work in this sector, especially in building companies; • The existence of foreign workers who compete with Omani workers; • The lack of trainee awareness of different occupational routes.
<p style="text-align: center;">Trainees And Graduates</p>	<ul style="list-style-type: none"> • The VET programs do not fulfil the needs of the job market because the machines and equipment are different than these of the companies; • There is no specialized committee for graduate employment that is concerned with following and monitoring their employment after graduation; • Some private companies collaborate only through special relations and they have limited abilities to provide training opportunities for trainees; • A vocational certificate is not classified to a financial degree and there is no coordination to equal this certificate financially;

	<ul style="list-style-type: none"> • Some trainers are unqualified; • There are no workshops to raise awareness regarding the needs of graduates and challenges facing them in the job market; • Low salaries and wages in the private sector for those who graduate from GVTCs; • Lack of financial awards ; • The lack of family encouragement for those graduates; • The job environment in the private sector frustrates graduates and discourages them to work in this sector, especially in building companies; • The existence of foreign workers who compete with Omani workers; • Consideration of the quantity rather than quality of graduates (each hall contains 25 trainees) which is contrary to the international systems (12-15 trainees only).
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6.2. Development procedures

Other main findings are that all the interviewees in case studies agreed that many development procedures can be used to address these challenges faced by trainees and graduates in GVTCs and the market place. The list below illustrates the interviewees' perspectives.

- Introduce the private sector in order to recognize the professional requirements and qualifications and to identify their satisfaction of the graduates;
- Employ one Omani national for every three expatriates with factious contracts;
- Establishing partnerships between the Ministry of Manpower, centres in the Departments of Counseling, Directorates of Employment and Directorate of Curriculums development in the Ministry;
- Introduce lawyers to clarify Omani Labour Law, the different fields of jobs in the labour market, and the hours credited for each job;
- Discuss the importance of changing certificates to a suitable financial level;
- Establish a database or information bank that provides graduates with necessary information regarding the different jobs and future requirements of the labour market;
- It is critical that salaries are raised and systems of scholarships are implemented to aid encouragement;
- Coordination with the private sector to provide jobs and training opportunities;
- Raising awareness of the importance of vocational employees in the labour market;
- The role of the media to raise awareness in society of vocational training;
- Increasing the number of trainees who get the chance to complete their higher education abroad;
- Intensifying English programmes to improve English language skills.

6.3. Conceptual Framework

It became apparent from the above findings that there is a link between quality of VET programmes and graduates' employability. Thus, this framework could enhance the GVTCs' graduate skills in Oman. The framework is shown in Figure 2.

Graduates Employability

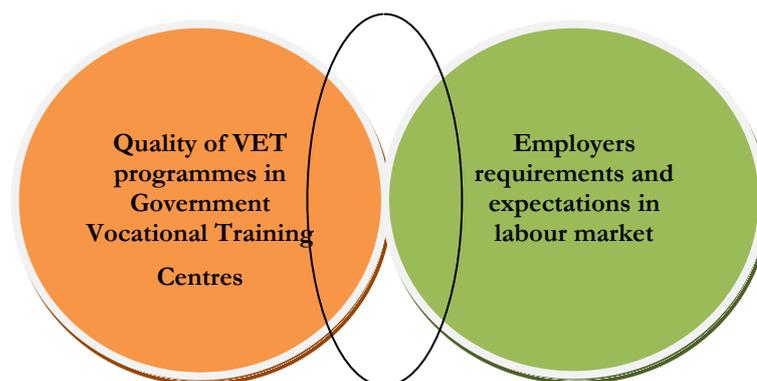


Figure 2: Conceptual Framework: the relationship between quality of VET programmes and graduates' employability

7. Conclusion and Recommendations:

Summarising from the above, close relations between trainees, VET centres and private companies have obvious benefits in contributing to skilled HR and equipment as well as possible financial support from local industry in recognising the consequential advantages of skilling existing and future workers. Additionally, it became clear from the above results that there is a relationship between quality of VET programmes and graduates' employability. This paper showed that there are several challenges which affect the employability of trainees and graduates in VET in Oman. It is clear from the study that there is an agreement by those who were interviewed on the challenges faced by vocational training. There are also some of the challenges of each group separately. For example, some private companies have limited abilities to provide training opportunity for trainees. Also, there is no particular committee for graduates' employment that is concerned with the graduates and follows their employment after graduation, as well as the vocational certificate is not classified to a financial degree and there is no coordination to equal this certificate financially. Thus, this paper explained the key development procedures that can be used to address these challenges in establishing partnerships between the Ministry of Manpower, centres in the Departments of Counseling, Directorates of Employment, Directorate of Curriculums development in the Ministry and private sector.

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Appendix A: Interview Questions for Directors, Administrators and Trainers of Government Vocational Training Centres

- Q1. Do you think that vocational training programmes meet the labour market requirements? Explain your answer.
- Q2. From your opinion, what are the key methods of teaching and training in respect to their impact on the employability skills in vocational training?
- Q3. From your view, what is the way to evaluate Government Vocational Training Centres trainees at the end of programme duration?
- Q4. Please indicate your opinion in the main skills in terms of their importance in assisting a smooth transition from vocational training centre to employment sectors?
- Q5. To what extent the vocational training programmes include the employability skills? And do you contribute in preparing these programmes?
- Q6. Have you had any contact with the employers to provide opportunities for the trainees and graduates to experience the real workplace environment?

- Q7. Do you think there are any difficulties for vocational training graduates to transfer from job to another? If you answered Yes, please explain the problems?
- Q8. From your opinion, what are the major challenges of the Government Vocational Training relate to graduates' employability?
- Q9. Which of the occupations do trainees and graduates from GVTCs prefer? And is the vocational job acceptable in Omani society?
- Q10. What do you think of the reasons that make graduates hesitate to accept vocational work?
- Q11. To attract trainees and graduates towards vocational work and develop graduates' employability, what is your view about the important procedures?
- Q12. If you have any other comments you would like to add, please do not hesitate to tell me.

Appendix B: Interview Questions for Trainees and Graduates of Government Vocational Training Centres

- Q1. Do you think that vocational training programme meet your occupational needs? Explain your answer.
- Q2. From your opinion, what are the teaching and training methods in respect to their impact on the quality in vocational training at your centre?
- Q3. Please indicate your opinion in the main skills in terms of their importance in assisting a smooth transition from vocational training to employment?
- Q4. To what extent your vocational training programmes include employability skills?
- Q5. How long between the times you graduate from the GVTC and get the occupation?
- Q6. Do you think there are any difficulties to transfer from occupation to another? If you answered Yes, please explain the problems?
- Q7. From your opinion, what are the major challenges of the Government Vocational Training in relation to graduates' employability?
- Q8. Which of the occupations do you prefer? And is the vocational programme or vocational job for which you are training acceptable in your society?
- Q9. What are the reasons that make graduates hesitate to accept vocational work?
- Q10. In your view how significant is the issue of skills employability in the development of vocational training programmes?
- Q11. What is your view of the important procedures that attract trainees and graduates towards vocational work and develop the graduates' employability?
- Q12. If you have any other comments you would like to add, please do not hesitate to tell me.

Read it. Solve it! : The potentiality of restricted ICT resources for differentiation of the instruction in Mathematics for students with Dyslexia who are integrated in the mainstream primary school in Cyprus and encounter difficulties in Mathematical Problem Solving

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Abstract

The general field of my research is the exploration of the potentiality of restricted Information Communications Technology (ICT) resources in Cyprus mainstream classroom for the differentiation of the instruction in mathematics for students with dyslexia who are integrated in the mainstream school in Cyprus. Since there is a plethora of difficulties in mathematics, I will focus on difficulties in Word Mathematical Problem Solving (WMPS) and the use of ICT for facilitating these difficulties for students with dyslexia. Therefore, my research aims to contribute in a field with a scarcity of research not only in Cyprus but internationally. Also, it aims to make suggestions for the cultivation of pedagogy which will lead to more inclusive and dyslexia-friendly schools through the collaborative learning and the use of new technologies. This paper describes the rationale of my research, the problem and the theoretical framework on which my research is based, methodology and design.

Keywords

Differentiation, Dyslexia, ICT, Inclusion, Word Mathematical Problem Solving (WMPS).

1. Introduction

Inclusion portrays a broader vision of integration emphasising the rebuilding of the curricular supplies in order for them to be accessible to all pupils as individuals. *Dyslexia* is a specific developmental disorder that affects literacy across the life-span. According to the phonological theory, students with dyslexia encounter difficulties in the presentation, storage and activation of speech sounds. Such difficulties are the answer we get when we ask someone to refer to the weaknesses of children with dyslexia. Since dyslexia is a specific difficulty of writing and speaking, obviously it is accompanied by difficulty in dealing with numbers and thus, mathematics in general and word mathematical problem solving (WMPS) in particular. In Cyprus, all students with dyslexia are included in mainstream schools, a fact that constitutes a challenge for teachers who have no training of how to manage difficulties in WMPS which derive from dyslexia. The chain failures lead to underestimated self-esteem and lack of self-confidence, a feeling that may lead to the abandonment of any trial to cope with mathematical problems. There is strong literature evidence that Information Communications Technology (ICT) can be used as an ultimate tool to support students with dyslexia, differentiate instruction, and thus, equalize the learning opportunities and physical access in the mainstream classroom. In this paper, I will outline my study's framework and design about how ICT facilitates the differentiation of the instruction in MPS.

2. Research Rationale

First, there is a need to explain the reason why I am conducting a research on this topic. Beyond the possible research contributions in a field with a scarcity of research, my project concept is based mainly on three axes: the notion of inclusion, the unexplored difficulties of students with dyslexia in WMPS and the accommodations provided by ICT as an ultimate tool for promoting inclusion.

2.1 Inclusion

The ultimate goal of contemporary education is the adjustment of the school to the special educational needs of every student and not the student's adjustment to the demands of school. Therefore the target of contemporary education is the creation of the school for everyone which goes along with the concept of inclusion (Vislie, 2003). This means that students with learning difficulties have the right to be included in the mainstream school. Since the school reality consists of classes of mixed ability, differentiation becomes necessary for achieving an effective teaching practice (Bearne, 1996). This means that the teacher is called to adjust his/her teaching framework to the needs, abilities and the personality of his/her students. The differentiation of instruction is crucial but on the other hand, it is a challenge for a teacher, especially when the students have completely different SEN.

2.2 Is dyslexia only about writing and reading?

There is a plethora of research focusing on dyslexia and the difficulties in writing and reading. However, there is scarcity of research in the case of difficulties in mathematics encountered by students with dyslexia (Gagatsis, 1999; Miles, 1992; Symeonidou, 2008). The same happens with the difficulties expressed by the students with dyslexia in WMPS. This means that this research area remains unexplored and gives me the stimuli to undertake an innovating research project in this field.

2.3 ICT: a tool for Inclusion

There is substantial evidence that ICT can be a tool for promoting inclusive education and equalizing learning opportunities for everyone. However, ICT resources are restricted in Cypriot primary schools (Mavrou, 2005); consequently teachers avoid implementing them during their instruction, thus learning difficulties of students are not accommodated by the helpfulness of assistive technologies. Therefore, it would be interesting to explore how the teacher can use the restricted ICT resources in a better way in order to help students with dyslexia to overcome their potential difficulties in WMPS.

The scarcity of suitable educational software for students with dyslexia that is available in Greek language is another reason that reduces the likelihood for the teachers to use new technologies for the needs of the students with dyslexia in their classroom. The heterogeneity of difficulties and characteristics of students with dyslexia questions the usefulness and helpfulness of educational software available on the market. The labels of software the most of the times turn out to be misleading because of the heterogeneity of difficulties, unsuitability for particular student's needs, unavailability in Greek language and the high commercial price.

3. The Problem

At this stage, I will discuss the two main problems that my research project is based on. Firstly, it is the problem derives from the general difficulties encountered by students with dyslexia that causes difficulties in WMPS and secondly, it is the problem with restricted ICT resources and the suitability of the available educational software.

3.1 Dyslexia and Mathematics

Dyslexia is a specific developmental disorder that affects literacy across the life-span (Reynolds et al., 2003; Snowling, 2000). It has been acknowledged as a consequence of a problem in phonological processing (Coltheart, 1996). Stanovitch (1998) stated that a child can be diagnosed with developmental Dyslexia if it underperforms in reading skills compared with its peers and if it fails to reach the appropriate reading skills after two years of schooling. This failure must not be supported by the existence of other cognitive or neurological deficits.

On the other hand, the value and use of mathematics in school life and life after school is undoubtedly very important. Students with dyslexia usually experience chain failures in school, so as a result their courage and self-confidence are substantially reduced (Markou, 1993). In these cases, opportunities for experiences of success seem to be crucial. However, the difficulties they face in reading and writing, inevitably cause additional difficulties in mathematics. Difficulties in mathematics are even more serious when the problems in short-term and long-term memory, orientation, and automatisisation abilities become more severe.

According to the triangle model of reading (Fig. 1), when the phonological pathway between orthography and phonology is weak, then the semantics and meaning are difficult to be reached. Therefore, the difficulty in decoding the letters into sounds, impede the pathway to semantics (Snowling, 2000). For instance, a student with dyslexia who experiences difficulties in reading the text of a mathematical problem, inevitably will express difficulties in understanding the meaning. It is obvious that he/she will not be able to reach the solution especially when the language and syntax of such mathematical problem is intricate and abstracted.

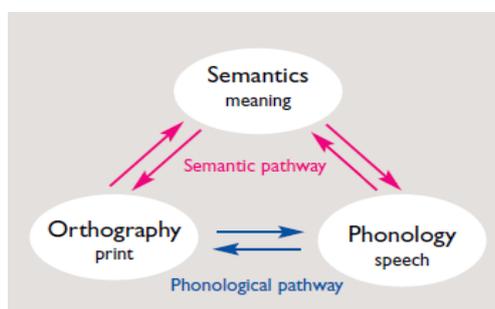


Fig. 1. Triangle Model of Reading (Snowling, 2000: adapted from Seidenberg & McClelland, 1989)

On the other hand, one of the most important reasons for having difficulties in mathematics is the inappropriate teaching method followed by the teacher (Gagatsis, 1999). Three main factors lie behind this cause. First, teacher may give word mathematical problems that has advanced level of abstraction, thus they are difficult even to be understood. Second, word mathematical problems have advanced formal demands that are not suitable for the current

students' knowledge level in mathematics. Third, the learning tempo may be too accelerated, therefore, it is unsuitable for slower learners (Malmer, 2000).

Smeets (2005) highlights that the traditional strategic approaches to mathematical problems cannot be learned effortlessly, due to the typical problems of students with dyslexia in learning flow, and their poor short-term memory. Students with dyslexia in this position will either start developing their own strategies-which may not be systematic, organized or feasible-or may abandon mathematics. Therefore, the need for effective interventions seems to be imperative and crucial.

3.2 ICT

There is substantial evidence that ICT has the potential for providing curriculum access and equal learning opportunities for learners with SEN in the mainstream school and especially for students who are considered as having dyslexia and encounter difficulties in several aspects of mathematics. Smeets (2005) describes the dynamic learning environment arising through the use of educational software for classroom differentiation with an environment with rich contents and plenty of authentic situations that connect the students with the outside real worlds, the active and sometimes independent learning activity, the ability of collaborative learning and the environment that allows adjustment of the curriculum as regards particular needs and peculiarities of each student individually.

However, one should pinpoint that a significant number of educational software can be found on the market. Teachers are usually interested to get more information about this software and contemplate on its usefulness before acquiring it for their teaching purposes. McKeown (2000) advises teachers to not consider labels advertising programmes suitable for dyslexia, since they for the most part turn out to be useless. Teachers should consider the individual needs of their students in order to choose the best assisting software available. In other words, teachers should be able to generalise and apply the information to their own situation (McKeown, 2000).

In addition, restricted ICT facilities and sources in Cyprus make any attempt for using new technologies for differentiation of instruction much more complicated. Particularly, every single classroom in all schools in Cyprus is equipped with at least one computer. Every school has at least one computer cluster in a dedicated classroom which is available for all students and teachers. Although, ICT has been included as a compulsory part of curriculum for either primary or secondary students in Cyprus, few educators use it for differentiation of their instruction (Mavrou, 2005).

4. Theoretical Framework

4.1 Mathematical Problem Solving and dyslexia

Word mathematical problems are usually short texts containing some information and data and a question which essentially determines how someone will act to solve it and give an answer. If the problem is not worded to be understandable, then the degree of difficulty increases. For many students, the reading of instructions and details of the text is the most serious difficulty. For the student with dyslexia, in particular, the deciphering of words demands so much energy that the chances of any understanding of the actual text are greatly reduced, and understanding may be defective (Symeonidou, 2008).

Miles (1992b) says that the greatest difficulty encountered by students with dyslexia in mathematics lies in tackling word mathematical problems, because of their severe lacks in

language. Therefore, it is not easy for a dyslexic student to understand the text of a given mathematical problem, particularly the language that teachers and mathematicians usually use in these texts (Miles, 1992b). They face problems with less everyday objects and unfamiliar words such as dimensions instead of size etc. The vocabulary in these problems consists of technical terms which have different meanings in everyday's life. When they read a problem, they may not get the meaning or not comprehend what sort of operation is needed because he/she may not focus on the right keywords (Symeonidou, 2008).

It is a matter of fact that language of word mathematical problems-texts is often so concisely compressed that every word becomes meaningful in solving them (Malmer, 2000). Many students with reading difficulties can, on the other hand, be very good at solving problems but the most of the times students with reading difficulties can solve word mathematical problems after the problem has been expressed in a simpler form. In many cases working with a classmate who has good reading skills can be beneficial (Malmer, 2000). This form of collaboration provides the students with opportunities to discuss together and reason things out; important elements in the learning of mathematics. In these situations it may be wise for students to have an audio version of the text or a software read-aloud facility (Malmer, 2000).

Students with dyslexia may face similar difficulties in reading a word mathematical problem to those that they address in reading any text. Apart from difficulties in reading, additional difficulties arise in comprehension and understanding. If a student with dyslexia is unable to read or understand the problem, then it is obvious that he/she will not be able to solve it. The successful solution of the problem requires understanding. Any ambiguity, misreading or misunderstanding will lead either to incorrect solution or no solution. The abandonment of the effort is common in the case of students with dyslexia, who often underestimate their abilities and leave the tasks uncompleted (Gagatsis, 1999).

Apart from the understanding-difficulty that lies in reading any text-the word mathematical problem involves a further difficulty which is equally important. After understanding, the problem needs a solution. Student with dyslexia encounters difficulties in choosing the appropriate strategy to solve the problem and difficulties in selecting and implementing suitable instrument that will lead to a solution. However, many students with dyslexia have difficulties in the next step. That is to say, if they understand the problem and choose the right strategy and appropriate action, they likely find it difficult to pose the equation or to implement the operations in order to find out the solution (Babbitt & Miller, 1996).

It is obvious that solving a mathematical problem requires the involvement of higher cognitive and deductive-abstract strategies, perception, attention and memory (Babbitt & Miller, 1996). Solving mathematical word problems is perhaps the most complex cognitive process in the subject of mathematics. According to the Cypriot mathematics primary school curriculum (MEC, 2006), dealing with mathematical problem requires the mobilization of knowledge and skills and promotes student's creativity. In order for students to be enabled to solve a problem, they must understand it at first, then devise and implement a solution plan and then check their answer. The comprehension of the problem is related to the ability of students to identify the given data and the question. Only when they can distinguish information they will help them to devise a plan to solve it (MEC, 2000).

In the final stage, pupils check the reached answer, by taking into account the given data and the problem's question. This helps in ascertaining the reasonableness of the answer. Students should engage in activities that require the monitor of the answer. For example, students may

be asked to judge whether the result seem reasonable, if there is another solution, if there is another way to get the answer or whether the solution verifies the problem (MEC, 2000).

According to Polya's (1945) model, problem solving in mathematics consists of 4 stages: understanding the problem; solution plan; execution of the plan; and evaluation. Krulik and Rudnick (1987) describe an additional mathematical problem solving model which consists of five stages: understanding the problem; investigation of the problem; choice of strategy; problem solving and checking the solution.

4.2 ICT, Dyslexia and WMPS

Many of the advantages of ICT facilitate pupils with SEN or without SEN. These advantages also apply equally for pupils with Dyslexia (Rooms, 2000). An advantage for students with dyslexia is the fact that computers enable multi-sensory elements to be incorporated into the natural education process. Learning becomes easily accessible considering that computers are an exciting way of teaching compared to traditional teaching approaches. ICT constitutes the ultimate tool for the best access to the curriculum for every learner (Loveless & Ellis, 2001).

Briggs and Pritchard (2002) highlight the need to use ICT in the daily mathematics lesson. ICT can enhance good mathematics teaching but it is not a panacea. It should only be used if it supports good practice in teaching mathematics in particular lessons. Thus, any decision about using ICT during the instruction of mathematics must be related to the learning objectives and the subject. In addition, ICT can be used if the teacher or student can achieve an objective in a more effective way with the use of ICT than without it. Otherwise there is no need to use ICT if there is no any additional value in the subject of mathematics.

The literature suggests a plethora of uses of ICT in mathematics (TTA, 1999). Several researchers have emphasized that technology-rich environments allow us to track the processes and strategies that students use in their trials to solve a problem in mathematics (Bennet & Persky, 2002). Beyond the assessment of students' cognitive skills in WMPS, ICT can help us to teach cognitive and meta-cognitive strategies (Way and Beardon, 2008) following five-step problem-solving model suggested by Krulik and Rudnick (1987). ICT can be used to prompt and cue cognitive processes that will help students successfully perform each of these steps (Babbit & Miller, 1996). Programs that incorporate text, graphics, sound, animation, and video hold promise for the development of sophisticated problem-solving software (Babbit and Miller, 1996).

Given the difficulties faced by students with dyslexia in WMPS, a question arises whether the student with dyslexia is able to understand and solve a mathematical problem by selecting and applying solving strategies and following the five-step problem-solving model suggested by Krulik and Rudnick (1987). What can ICT does to facilitate these difficulties? The following table is an attempt to correspond the stages for WMPS with the difficulties encountered by the students with dyslexia and the role that ICT can play in each stage.

Table 1: The role of ICT in each stage of word problem solving for students with dyslexia

Stage of Problem Solving	Dyslexic type difficulty	The role of ICT
Comprehension: careful reading	Reading Difficulties	Simplified restatement of the problem. Audio version of the problem. Links to synonyms. Links to simplified definitions. Text with pictures, replacement of difficult or key words with a picture
Comprehension: problem data (question, information, numbers)	Difficulty in finding given information and question of the problem	Tools for grouping given details and questions. Capability of different labeling of given details and questions. Representation of data with images, sounds, drawings, diagrams, graphs, mathematical symbols. Visualization of the problem, concept mapping
Investigation: Organisation of data	Difficulty in organizing given information. Weaknesses in choosing useful details	Tools for grouping given details and questions. Capability of different labeling of given details and questions.
Investigation: Design of solving plan	Difficulty in organisation, weaknesses in memory	Examples, auxiliary indications
Choice of suitable strategy	Weakness of memory, weakness in recalling strategies, unawareness of problem solving strategies	List with various strategies with explanations and examples that facilitates short-term memory, feedback
Problem Solution	Weakness in implementing problem solving strategies	Explanation of strategies, visualization of strategies, implementation by using diagrams, pictures, tables, drawings etc
Checking the solution	Weak self-esteem, reduced likelihood for checking the answer	Feedback, positive encouragement, re-representation

5. Methods

My research project will consist of 3 case studies. Each case will be a classroom of primary school in Cyprus with students who are diagnosed as having dyslexia and students without dyslexia. At this stage, I will briefly present the aims and objectives of my research, the participants and the design, according to the research plan of what will be done the next few months

5.1 Aims and Objectives

My research aims to explore the impact of the use of the available free-content software for the design of learning environments for differentiation of instruction in two different settings on the performance, classroom involvement, peers interaction of students with dyslexia with difficulties in mathematics. Two different settings will be (1) students in pairs using computers in school's lab and (2) student with dyslexia with a parent using the computer at home for homework.

5.2 Participants

The main participants will be students with dyslexia and students without dyslexia attending the 4th, 5th or 6th grade of primary school in Cyprus. Students attending these classes are aged 9-12 years old. I do not prefer younger ages because the most of the times there is no safe diagnosis of dyslexia before Stage 3; students may have limited knowledge and experience in computer use and the curriculum in mathematics for the stages 1-3 does not emphasize on word mathematical problem solving in the extent that stages 4-6 do.

5.3 Tools for data collection

The designation of appropriate data collection methods is an outcome of a description of what constitutes the required data. Qualitative research methods have been chosen to suit the purpose of my study. The tools that I am going to use for data collection are interviews, observations, screen recordings and pre-tests and post-tests.

5.4 Design

At this section, I will briefly present the research design. The figure 2 shows the procedure.

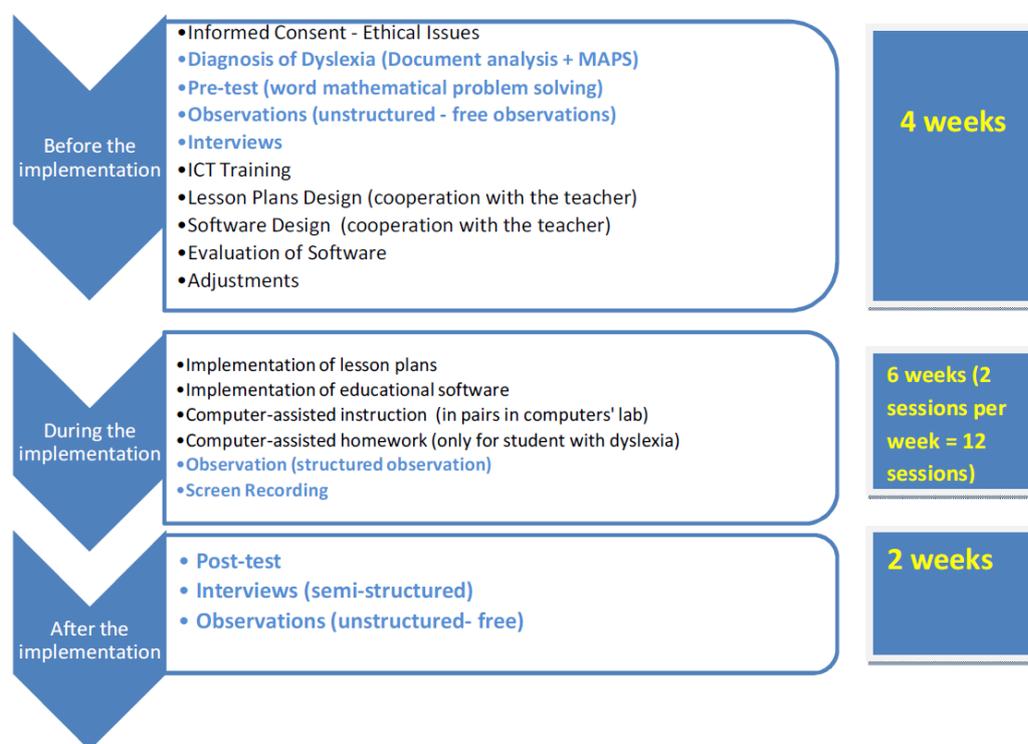


Fig. 2. Research Design

Stage One: Before the Implementation

Semi-structured interviews and free observations during the instructions will be conducted. Students with dyslexia, their peers without dyslexia and the teacher of the classroom will be interviewed, while the whole classroom will be observed during the instructions before the implementation of the programme. A student with dyslexia, five peers without dyslexia and

the teacher of the classroom will be interviewed in each of the three case studies that will be conducted for the purposes of this research. Both interviews and observations will help me to collect the initial and useful information about the level of the classroom, the relationship between the students, the students and the teacher, the use of ICT during the instructions, the general climate in the classroom and so on. Then, it is necessary to grant a mathematical test (pre-test) recording the capacity and difficulties in WMPS for all students of the classroom.

If the students lack knowledge and experience using a computer, training for computer basics must be preceded before the implementation of the interventional program.

After the screening of dyslexia and recording of potential characteristics, knowledge and difficulties of the students with dyslexia, the first attempt to design a preliminary computer-assisted learning environment will follow, for the evaluation of its functionality, usability, effectiveness and affective. The design will be game-like and will be based on Mayer's multimedia principle which refers to individual preferences in terms of the use of animation, auditory narration and text (Taraszow et al., 2007).

Interestingly, according to Mayer's (2001) 'Cognitive Theory of Multimedia Learning', the simultaneous presentation of animations with narrations facilitates learning of facts and concepts (Harp & Myer, 1998). The theory is based on the principle of '*dual coding*' (Clark et al., 1991; Paivio, 1986) which asserts that the total amount of information that can be processed by an individual is greater when it is multiplied between multiple senses. More, multimodal processing reduces cognitive load because information from different modalities is processed differently (Mayer, 2001).

The design idea is based on the use of tools that are available to the teacher such as the educational software packages Hyperstudio and Inspiration which are widely used in Cyprus and provided by the Ministry of Education and Culture.

After the evaluation of the concept of the programme and the adjustments, the final concept of the design will be defined with cooperation with the teacher. The design of the program will be associated with the design of a series of lesson plans with cooperation with the teacher. The design will be based on the current planning of the classroom's teacher and a particular unit of school textbook, but the teaching should be differentiated using computer-based program. The first stage will last for four weeks for each case study.

Stage Two: During the Implementation

Lesson plans and implementation of computer-based learning environment will take place in computers' lab in the presence of classroom's teacher and me in each of the three different classrooms. Students will work in pairs. Each pair will use a computer. Students will use the software on the computer that will guide them to follow the stages for word mathematical problem solving from the stage of understanding through the stage of choosing the appropriate strategy and then reaching the solution.

Vygotsky (1978) formulated the theory of human development. According to this theory interactive and socio-cultural learning depends on "adult guidance" or "collaboration with a more capable peer" (Vygotsky, 1978, p.86). He poses one of the strongest grounds of the theory and practice of collaboration which can be generalised for the collaborating learning in the classroom. Mavrou (2005) makes an analogue linking of the non-disabled peer as the "capable" one that allows us to be based on Vygotskian theory for collaboration of disabled children with their non-disabled peers.

The teacher will follow the lesson plan on which the design of educational software will be based. It will include activities involving the whole class and activities for collaborative learning in pairs. During the instructions, teacher and I will play a significant role in the

implementation of the project. I will act as teacher assistant and will be providing feedback to students while they will be working in pairs. At the same time, the conversations and acting of the pair with the student with dyslexia and the peer without dyslexia will be video-recorded and the computer's screen will be recorded.

The second stage will last for six weeks for each case study. The program will be implemented twice per week, therefore twelve sessions will be held. Apart from the implementation of the interventional programme in the classroom, there is an additional supplementary part which will be home-based. For this particular part of the project, students diagnosed as having dyslexic-type difficulties will be selected in order to investigate the potential of new technologies in word mathematical problem solving for homework especially for students with dyslexia. The use of software at home will be an extension of the main intervention in the mainstream classroom which will provide the opportunity to students who are diagnosed as having dyslexia to solve word mathematical problems on the computer instead of solving mathematical problems in the traditional way with paper and pencil. The intervention will consist of 4 30-minute sessions for the period of 4 weeks (1 session per week) at home with the use of computer and parent's presence. The sessions will be filmed and the computer's screen movements will be recorded for the purposes of the research.

Stage Three: After the Implementation

After the implementation of the interventional program, the post-test for a reappraisal of performance and the evaluation of cognitive and meta-cognitive skills acquisition will be addressed. Pre-tests and post-tests will be administered to all students of the classroom either they are considered as having dyslexia or not. So, I will be able to assess the level of the classroom as regards word mathematical problem solving and make comparisons between their performances before and after the interventional program. In the case of students with dyslexia, the administration of traditional paper-and-pencil tests causes additional stress. For this reason, I will discuss the mathematical problems of the tests orally with students with dyslexia. Through the discussion, potential weaknesses of students with dyslexia in solving mathematical problems and use of cognitive and meta-cognitive strategies will be illustrated.

Tests will consist of 5 mathematical problems with additional comprehension questions. The pre-test and post-test will be the same. The advantage of using the same test before and after the implementation of the interventional programme is that we ensure the equality of the two tests, therefore we ensure that we measure the same variables and any potential change because of the implementation of the programme, something that increases the validity of the test and proves the level of the effectiveness of the programme.

Also, after the implementation of the interventional program, semi-structured interviews with students, the classroom's teacher and parents will be conducted. The purpose of the interviews is to give to interviewees the opportunity to express their views and attitudes of using a computer, the implementation of the interventional program, changes in relationships and interactions between the student with dyslexia and peers without dyslexia, experiences, attitudes and opinions of the teacher in planning and implementation, experiences and attitudes of parents of students with dyslexia after the implementation of the interventional program for the homework, etc. Along with the interviews unstructured observations will be held during the instruction without using a computer in order to record possible changes in the relationships between the student with dyslexia and non-dyslexic peers and the participation of students with dyslexia during the instruction.

6. Conclusion

In this paper, I addressed my research proposal and I provided details regarding the theoretical framework, the problem, methodology and design of my project.

However, some challenges may constitute a threat for my research project. For example, the restricted ICT resources available in Cypriot schools, the limited experience in using computer by the students, the limited ICT skills on behalf of the teachers, the notion of technophobia or the threat of stigmatisation and exclusion of the students with dyslexia, if they are the only users of a computer in the classroom.

By means of conclusion, I hold the view that the accomplishment of the ulterior purpose set by the contemporary sciences of education will be fulfilled only when one can speak of an inclusive education which will provide equal learning opportunities for everyone. The effectiveness of teaching will depend on the teachers who should research the desirable means in order to offer equal opportunities. The use of ICT and the implementation of educational software probably constitute the most dynamic means for the accomplishment of such an audacious, perhaps very optimistic-but nevertheless feasible purpose.

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Housing –Related Problems of Roma in Finland and Gypsies and Travellers in England

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Abstract

This paper presents a comparative exploration of the situation of Roma in Finland and Gypsies and Travellers in England who live in housing rather than ‘traditional’ caravan accommodation.

It has been estimated that two thirds of Gypsies and Travellers in England and 84 per cent of this community living in London now live in ‘conventional’ housing (CRE, 2004; LGTU, 2010). Research indicates that half of these ‘housed’ communities would prefer to live in caravans (LGTA, 2008). To be forced to abandon the travelling lifestyle has had serious effects on individuals’ well-being (Cemlyn et. al., 2009). The loss of close family networks when families are re-housed and experiences of hostility and discrimination from their settled neighbours, means that many Gypsies and Travellers decide to hide their identities when moving into settled housing. The combination of racism, poor housing and frequent movement has serious implications for the communities’ well-being, identity and access to services.

In contrast, the Finnish Roma have been settled for the last 40 years and now, because of positive discrimination policies of the Finnish Government enacted in the 1970-80s, live in houses of the same quality and in the same areas as the rest of the Finnish population. In spite of this, according to the Ombudsman of minorities the Roma still experience numerous, serious housing related problems in Finland (Finnish National Policy on Roma, 2009). The strong gender, generational and hygiene/cleanliness customs within Roma culture are the main reasons causing collisions and misunderstandings with their non-Roma neighbours.

If we consider access to a ‘home’ to be one of the most important elements of our well-being, it is necessary to study why these two ethnic communities are experiencing numerous serious housing-related difficulties in two very different Western post-modern welfare societies.

Keywords

Roma / Gypsies / Travellers; Finland; England; housing; integration.

1. Introduction

This paper will discuss the situation of the Roma in Finland and housed Gypsies and Travellers in England by analysing statutory and third sector documents, research reports, grey literature, Bills and Acts from the countries in question. Since the European Union has declared 2005 – 2015 as the “Decade of Roma Inclusion”, it is particularly important to find out what different EU countries, in this case Finland and England, have done for the inclusion of Roma, Gypsy and Traveller communities.

It is estimated that two thirds of Gypsies and Travellers in England and 84 per cent in London now live in contemporary housing (CRE, 2004; LGTU, 2010) in many cases against their

own will (Cemlyn et al., 2009; LGTAA, 2008). These communities experience serious and numerous problems when entering the settled way of living in bricks and mortar houses. The Finnish Roma have been living settled lifestyles for the past 40 years which was the result of urbanization and the impoverishment of rural life, the assimilation policies of Finnish government in the late 1960s, and the positive discrimination measures that helped the Roma to find housing (Pulma, 2006). Because of the positive discrimination policies in the 70s and 80s, the Roma now live in the same areas and same standard houses than rest of the Finnish population. In spite of this, they still face more housing –related problems than most other minorities or majority in Finland. (Finnish National Policy on Roma (FNPR), 2009). By studying the relevant policies, practices and cultures of Finland and England, this paper will show how the Finnish Roma and the Gypsies and Travellers in England are still lagging behind in housing –related well-being in these two very different European postmodern welfare states.

The Roma in Finland were defined as an ethnic minority in the 1960s and recognised in the law as a national minority in 1995 (Jäppinen, 2009). Research about the well-being of Roma in Finland is rare since in Finland it is illegal to register people by their ethnicity, and for this reason no relevant statistical data is available about the Roma population. The system contains information about e.g. person's nationality, native language and a membership of any religious community, but since Finnish Roma are Finnish nationals, speak Finnish, and the majority practice the most common religion in Finland (Evangelical Lutheran Christianity), it is impossible to identify them from the data stored within the register. This paper excludes the newly arrived Eastern and Central European Roma as its subject of analysis, since in due of their short history of migration to Finland, these communities have not had long enough experiences of residing in Finnish housing complexes to offer comparable analysis.

In English case this paper concentrates on Romany (English) Gypsies and Irish Travellers, but acknowledges that these are distinct communities with differing pasts. By referring to these communities as “Gypsies and Travellers” it is only suggested that because of their past or present nomadic way of life, resemblance in cultures and similar experiences of socio-economic exclusion and discrimination in England, it is more practical and justified to refer to them under one umbrella heading “Gypsies and Travellers” as is common in English policy documents. Some other communities in England, namely Welsh Gypsies, Scottish Gypsy-Travellers, European Roma and New Travellers are excluded from this paper, although it is acknowledged that these communities are highly likely to experience similar rates and types of exclusion and housing related difficulties as are English Gypsies and Irish Travellers resident in England. English Gypsies were first recognised in English law as an ethnic minority group in 1989 (Mayall, 1995), and Irish Travellers in 2000 (Power, 2004). Since Gypsies and Travellers have not been considered as a separate ethnic groups in the decennial Census until the Census undertaken in April 2011, no comprehensive data exist about the exact number or overall well-being of the Gypsies and Travellers e.g. about the numbers and circumstances of living in conventional housing. When the 2011 Census is available for analysis, it will potentially provide more information about these communities and their living situations, although also the Census might produce inaccurate information if or when someone fails to complete it or are missed off from it.

2. Theoretical framework

The intention of this paper is not to try to claim that nomadism is somehow the nucleus of Gypsy and Traveller cultures and should be preserved as such, but instead the intention is to try to demonstrate the potentially negative impact that being forced to move into settled

housing have on these communities well-being (Power, 2004; Richardson et al., 2007; Cullen et al., 2009; Ryder & Greenfields, 2010).

Since this paper mainly explores the empirical and policy evidence of the issue in question, the theoretical models used will be left for future papers to concentrate more on.

3. Data

The data analysed to support this thesis consist of different statutory and third sector documents, reports, professional handbooks and academic research about the current housing situation and planned actions to improve the situation of Finnish Roma or the Gypsies and Travellers in England. The selected methodology consists of a comparison of the situation of these communities by looking at the policies, practices and the culture of these two countries. As established above, the focus will be on housing issues since it, according to the studied data, turned out to be area that caused most problems in both countries. The data will be presented by introducing the cases of Finland and England separately.

The Finnish Ministry of Social Affairs and Health’s proposal of the working group for a national policy on Roma (FNPR) (2009) is a comprehensive report made in collaboration with different ministries, organisations and individuals, Roma and non-Roma. This document gives a thorough picture of the accommodation related welfare situation of Finnish Roma and introduces the planned actions to be taken to enhance the situation. It has an in depth description of the accommodation circumstances of the Roma and also more extensive view of the policy climate affecting the Roma. Because of its comprehensive nature, The FNPR will be the document that data from England is compared to. To ensure reliability and enable triangulation of data, in a relation to policy approaches a professional practice handbook made for social workers working with Roma (Oulun kaupunki, 2007), the Finnish Ministry of Social Affairs and Health’s ‘Strategies of the policy on Roma (Suonoja & Lindberg, 2000) and a report made about the specific housing –related issues in the Roma culture (Pirttilahti, 2000) will be analysed.

Since there is no official National Policy on Gypsies and Travellers in England, the data from England is based upon different types of documents e.g. third sector publications, professional practice handbooks and academic research. The findings from the English data will be compared to Finnish data in relation to housing related issues, but also to find out what are the overall policy, practice and cultural differences between Finland and England that influence the housing -related well-being of the communities in question.

The data is studied by taking a critical approach, and assuming that power structures which impact on Gypsy, Traveller and Roma well-being, are, or may be in place to maintain dominant structures and hegemonic order.

4. Housing problems

Table 1: Housing –related problems among the Finnish Roma and Gypsies and Travellers in England according the studied data.

Finland	England
-	Cultural aversion/unable to settle
Loss of community	Loss of community

Big family sizes: overcrowding	Big family sizes: overcrowding
Regular visit from extended families	Regular visit from extended families
Cultural honor and cleanness –codes derived problems (e.g. cultural ‘avoidance practice’)	(Some evidence of) Cultural honor and cleanness –codes derived problems , (‘avoidance practice’*, and using only the lower floors of a two-storey house).
-	Living in deprived areas
Neighbor hostility and bullying	Landlord/neighbor hostility and bullying
Socio-economical problems paying the rent	Illiteracy and/or socio-economic derived problems in paying the rent
Homelessness	Homelessness
Discrimination by municipalities	Discrimination by housing officials
Insufficient amount of government funded rental apartments available	Insufficient amount of social housing available

*‘Avoidance’ is mentioned by Greenfields (2006) in Clark, C. and Greenfields, M. (2006), pp. 29- 30, 119, but not specifically relating to housing issues.

4.1 Finland

It seems that one significant difference in housing issues between the Finnish Roma and Gypsies and Travellers in England is that the Roma in Finland are more integrated in case that they live in the same areas and same standard houses than the rest of the Finns (FNPR, 2009), while Gypsies and Travellers in many cases are forced to settle and often to the most deprived areas (Cemlyn et al., 2008). This is mostly due to Finnish Governments positive discrimination policies towards the Roma in housing in the 1970s, and the active role of several Roma organizations in promoting issues affecting them. In the mid 1970s and early 1980s a special housing law was introduced to help the municipalities and private Roma to apply for government supported mortgages (Pulma, 2006; Oulun kaupunki, 2006:68). Grants were admitted to municipalities, Christian congregations and registered associations for building, obtaining and repairing rental apartments for the Roma population (Pirttilahti, 2000:3). The conditions of these rental apartments today, are hardly suitable for living because of their poor state (Asukasliitto RY, 2007). Further hardship has been caused by the ending of the special loan (available between 1987 – 1995 from the Finnish Government’ budgets) which provided apartments as a high priority for the homeless, refugees and Roma. As access to this loan has now ended, improvements in the living situations of the Roma have decreased which externalises in overcrowding and in prolonged periods of homelessness (Pirttilahti, 2000:11).

The large amount of housing related communications and reports on discrimination received by the Finnish Advisory Board on Romani Affairs and the Ombudsman for Minorities by the Roma (FNPR, 2009:65), provides evidence of the magnitude of the housing problems faced by the Roma population; in 2009 40% of all housing related contacts received by the Ombudsman of Minorities concerned the Roma. Also in 2009 the Ombudsman of Minorities (2009b) received the total of 100 Roma related cases of which 35 concerned problems experienced in housing. The Finnish Ombudsman of Minorities (2009a) reports that most of

the housing related problems Roma report have to do with the availability of government funded rental apartments, problems in changing apartments due to inevitable culture –related developments (e.g. young Roma getting to a certain age or the bereavement of a family member) or with problems of everyday life e.g. excessive use of laundry rooms (to be discussed below).

Due to their usually weaker economic status and the negative stereotypes and prejudices against them, most Roma in Finland are dependent on municipal and non-profit rental housing (FNPR, 2009:65). In most cases Roma will not even try to apply for privately rented apartments because they fear to be discriminated against and because of previous poor customer service experiences (The Finnish Ombudsman of Minorities, 2009a). Difficulties in providing required funding usually prevent Roma from obtaining houses of their own (ibid., p. 59). The most common type of residence for the Roma in Finland are rented, government owned small apartment building block flats (Oulun kaupunki, 2006).

As has been established above, the Finnish Roma have not been nomadic for the last 30 – 40 years and now live mostly in the same areas and similar housing conditions to the majority population. The improvements in living conditions have significantly changed some of the more traditional elements of the Roma community. Now, more often big extended co-resident family groups are replaced by nuclear families, and the strong communality of the Roma has in some degrees weakened. (FNPR, 2009:19). Although there have been significant improvements in housing, the Association for Tenants and Homeowners' report (2007) states that Roma families live in too crowded houses in due to their bigger family sizes greater hospitality and willingness to help a family member in need for a place to stay. In fact, according to Grönfors (1979:5), the most vital element of Roma (Gypsy) life is the preference on collectivity instead of individuality, and this is the element that defines most aspects of their culture.

The most common problems Finnish Roma face or cause in relation to housing are an excessive use of laundry rooms and the vast number of visitors due to their traditional hospitality (Pirttilahti, 2000:4). The strict cleanness codes of the Roma culture makes it necessary to e.g. wash kitchen items separately from bedroom items, men's clothes separately from women's, elderly' separately from young people's, and e.g. underwear separately from rest of the clothes (Oulun kaupunki, 2006; Pirttilahti, 2000). When Roma families live in housing estates with common laundry rooms, conflicts arise with other residents when the Roma reserve washing machines and dryers for long periods of time, in order to wash everything according their cultural codes. Pirttilahti writes that because of Roma's emphasised hospitality, visitors are welcomed almost any time of the day. This causes problems especially in housing estates with small parking areas where visitors may not know where to park their vehicles (ibid., p. 18).

From the Finnish social services perspective the most worrying group are those Roma who in spite of being inside social assistance programs for long periods of time are still economically deprived and face serious, often housing related problems. These problems are listed as repeated homelessness, evictions, unpaid rents and anti-social behavior. (Oulun kaupunki, 2006:4.). Roma's periods of homelessness are considerably longer than the rest of the populations (Association for Tenants and Homeowners' report, 2007:11) which stems from multiple and interrelated socio-economic problems such as alcohol and drug abuse, financial difficulties and mental health problems (Oulun kaupunki, 2007:83). In some cases feuds between rivalry families or, above discussed, problems in living according to honour -and cleanness codes might enhance the risk of homelessness for some individuals (ibid., p. 83).

When the housing situation deteriorates to this point, there is also a danger that the person is abandoned by the Roma community if the person have repeatedly broken the communities cultural codes and brought shame to his/her family. This can be very harmful to a person who is used to having the support of the whole extended family, and cause a further downward spiral. In fact, the support that the community and family traditionally provide to a Roma, Gypsy or Traveller may well be equivalent to the support that the welfare state offers through its services.

According to different Roma organisations and local level actors some Finnish Roma are becoming socially and economically excluded from both, the wider society and from the Roma community (FNPR, 2009). Especially vulnerable are said to be young adults and young families who are experiencing difficulties in managing their everyday lives (p. 54). This might well be due to the change in lifestyle, from living with big extended families to moving into smaller nuclear families. When lifestyles have changed, impacting on living arrangements but not in the cultural practices still strongly affecting Roma's lives (FNPR, 2009; Oulun kaupunki, 2006; Pirttilahti, 2000), building wider networks in order to integrate better to the society is presumably harder, and may cause difficulties in many areas of life e.g. in housing. Also, since Roma form families in early stages of their life, the overall knowledge of parenting or budgeting can be inadequate and cause problems in everyday life. It is good to acknowledge that this is not specific only with young Roma (Gypsy/Traveller) families, young families in general are more likely to experience difficulties such as reduced educational opportunities, negative employment outcomes, dependence on benefits and adverse housing outcomes (DH, 2007). The difference is that Roma (and some other ethnic minorities) more often aspire and plan to set up families in early age, whereas teenage pregnancies are commonly seen as problems and mistakes in mainstream western societies (e.g. DH, 2007; Daguerre & Nativel (eds.), 2006).

4.2 England

The overall situation that stands out from the studied English data is the pressure to assimilate or integrate which successive UK governments have exerted on the Travelling people (e.g. Bancroft, 2005; Belton, 2005; Hawes & Perez, 1996). For example, McVeigh (in Acton (ed.), 1997:9) defines settled living as sedentarism or as “a system of ideas and practices which serves to normalise and reproduce sedentary modes of existence and pathologise and repress nomadic modes of existence.” It might be even argued that this effort has in some ways succeeded since, as noted above, two thirds of these ethnic minorities now live in settled housing. (Cemlyn et al., 2009). On the other hand, the well-being of Gypsies and Travellers, now living in conventional housing, has not improved. The National Health Services (2009) Primary Care Service Framework concentrating on Gypsy and Traveller communities, states that the health needs of settled Gypsies and Travellers are at least equally neglected as are those of mobile Gypsies and Travellers, if not even more.

The reason for the Gypsies and Travellers in England to abandon travelling has most to do with the insufficient numbers of sites provided by the State and Local Authorities, and because of the poor conditions of sites that are badly maintained and constitute serious health risks (Richardson & Ryder, 2009 in Sigona & Trehan (eds.); Brown & Niner, 2009; Cullen et al., 2008; LGTANA, 2008). Although it is also worth mentioning that some Gypsies and Travellers decide to move into housing in order to gain better access to services and employment (Ryder & Greenfields, 2010), evidence shows that over half of housed Gypsies

and Travellers would still prefer to live on sites and feel unable to settle (Cemlyn et al., 2009; LGTAA, 2008). In fact, it has been found in law that there is cultural aversion among the Gypsies and Travellers towards living in housing (Johnson, 2009; London Boroughs' Gypsy and Traveller Accommodation Needs Assessment report (LGTANA), 2008). This alone indicates that housing related issues are especially relevant to Gypsies and Travellers well-being. Power (2004:47) writes that Travellers' mental and physical well-being can be seriously undermined when they are put into accommodation that averts the maintenance of the supportive extended families. Feeling of isolation appear as stress and anxiety when Gypsies and Travellers have to experience a total change of lifestyle by moving from sites into settled housing (Cullen et al., 2008:18). Richardson et al. (2007:38) found out that most of the Gypsies and Travellers they interviewed, living in settled housing in East Kent sub-regions, were experiencing cultural aversion towards living in bricks and mortar houses. The interviewees described e.g. loss of freedom, unable to move and isolation from family and friends as some of the symptoms deriving from being forced to settle into a house. Kenrick and Bakewell established already in 1995 that the strong Gypsy and Traveller communality was at risk in due to legislations that promoted the disappearance of sites (p. 63), and Greenfields (2006) and Greenfields and Smith (2010:6) have found out that moving into housing is weakening the traditional kin-based social structure of Gypsy and Traveller communities.

The problems Gypsies and Travellers usually face whilst living in housing are: illiteracy derived problems in paying the rent, landlord/neighbour hostility and bullying, big family sizes, regular visits from extended families and parked caravans. Overcrowding, due to large family sizes, is a major factor identified in GTAAs and possibly diminishes the well-being of housed Gypsies and Travellers in England (Greenfields, 2006). According to the 2001 census the average numbers of people living in a household in England and Wales is 2.36, whereas the number for Gypsies living in London is 4.4 and for Irish Travellers in housing in London 4.5 (London GTANA, 2008:66). According to Thomason (2006 cited in Cemlyn et al., 2009:22) 'neighbour trouble' were considered more serious than problems relating to poor quality housing, as at least more reports were made by interviews about problems with neighbours impacting on their satisfaction levels in housing. Niner (2003) also found out that 53 per cent of the local authorities that answered to the send out postal surveys stated that Gypsy and Traveller tenancies ended more often within a year than all the rest tenancies combined, and half of them because of problems with neighbours (and unable to settle) (Niner, 2003:56).

While we saw above the numerous cultural practices that affect the living of Finnish Roma, researches about the cultural practices affecting Gypsy and Traveller communities are rare. Banton, writing in 1983, mentions few features of Gypsy/Traveller culture that might have/had an effect on their living arrangements, namely the fumigating of a house if it has been occupied by non-Gypsies; and the use of separate bowls for personal washing, laundry and food items (1983:160). These practices describe living in caravans rather than in bricks and mortar houses, and more research is needed in order to prove if any of them are transformed into settled living.

Cullen et al. (2008) state that in England housed Gypsies and Travellers live and mostly prefer to live in houses rented from social landlords because those provide more security of tenure and disrepair problems aren't as usual (p. 18). In contrast, the London Boroughs' Gypsy and Travellers Accommodation Needs Assessment (LGTANA, 2008) report concludes that many housed Gypsies and Travellers prefer to stay in the private housing market, because this enables them to hide their identities from the local authorities and neighbours in order to avoid discrimination and harassment (p. 40). Both reports are

published within a month in 2008, so we have to exclude the changing of situation as a reason for this controversy. The reason for this controversy might be due to different priorities of individuals or groups [Romany Gypsies and Irish Travellers] in question, for example as whether living conditions or ethnic identity is more important to them. To be sure there has to be further research on the subject. Cullen et al. (2008) note that because there are insufficient amount of social housing available and pressure on housing stock, increasing number of Gypsies and Travellers have to rent from the private sector in cities. However in 2008 68 per cent of Gypsies and Travellers interviewed in London still rented from a council or social landlord (LGTANA, 2008). It seems quite contradictory that even when 68 % of Gypsies and Travellers rent from social landlords, there are arguments that they have not benefitted from the social housing system. For example Cullen et al. (2008) write that Gypsies haven't got enough information about the social housing system, and that they often experience discrimination by the housing officers and social landlords (pp. 19 – 20). To support this argument, one third of the participants of the 2008 LGTANA had experienced discrimination in e.g. housing departments and health services (p. 6). It might be that this discrimination actualises when Gypsies and Travellers are located in the most deprived areas (Cemlyn et al., 2008).

The exact number of Gypsies and Travellers in conventional housing remains uncertain since local authorities and housing associations rarely include the numbers, applications or needs of Gypsies and Travellers in the monitoring processes, and also because many of them still hide their ethnicity from the authorities (Cullen et al., 2008:11). It might be that since in England most of the focus in Gypsy and Traveller housing issues is still on tackling the issues of providing sites and pitches for the travelling members of these communities, that not enough has been done for the needs of those who want to or are forced to settle. The London Gypsy and Traveller Unit (2009; 2010) reaffirm this argument stating that the London Housing Strategy and the draft of the London Plan puts housed Gypsies and Travellers needs as secondary to those living on sites (p. 4). Although housed Gypsies and Travellers might be worse off when it comes to accommodation related needs, on the other hand it can be they are better off with access to other services, such as education and health as they have stable accommodation and find it easier to register for services (Bromley Borough, 2009:13).

When in Finland the Roma do not live in deprived areas any more often than rest of the population, in contrast, in England housed Gypsies and Travellers typically reside in the most deprived estates (Cemlyn et al., 2008). Ryder and Greenfields (2010) argue that this is likely to make these communities become more marginalised as they will also experience environmental disadvantages common for people living in these areas. Although it is good to acknowledge that one reason for these communities focusing on deprived areas is their willingness to live near family and friends, so that when someone gets offered an apartment in a rough neighbourhood, others may follow just to be close to their community (ibid.). One explanation for the continued 'dumping' of Gypsies and Travellers in poor accommodation may be that in England these communities have, compared to Finnish Roma, been less active in promoting themselves politically and the issues affecting them (Cemlyn et al., 2009). Mayall (1995) considers that this lack of political engagement may be explained by the hostile role of the local authorities in implementing new policies towards Gypsies and Travellers across history, leading to reluctance for members of these communities to engage with 'authority'. In recent decades most of the conflicts have to do with planning permission for Gypsy and Traveller sites as these usually evoke strong and racist opposition among the local residents, who then lobby the Local Authorities to make negative statements. Richardson (2006) writes about the power that local authorities and the media have when they produce negative and discriminatory discourses to classify Gypsies and Travellers as

“folk-devils”, and reinforce the image of these communities as something that is not normal and what should be objected. She argues that Gypsies and Travellers are “unpopular in public discourse and seen as ‘costly’ to society” (ibid., p. 88).

5. Conclusion

Greenfields and Smith (2010) quote a housing officer in their study:

“ ... they [Gypsies and Travellers] are very mobile within housing and don't stay put for long, they're moving around and using houses like wagons, the lifestyle doesn't stop just because they're in housing.” (p. 408).

Accordingly, research evidence seems to indicate that living in a conventional house hasn't completely ended the travelling lifestyle, not least because GTAA evidence (see Cemlyn et al., 2009) indicates that a high percentage of Gypsies and Travellers continue to travel seasonally or to participate in cultural events which involve travelling to and from fairs in caravans and living a ‘traditional’ lifestyle for the duration of the event. Also the Finnish Roma, in spite being settled for the last 30-40 years, seem to be more mobile than the rest of the Finnish population (although more evidence is needed). The reasons for this includes avoiding harassment by the neighbours, strict cleanness, inter-generational and gender codes, and specific ‘avoidance’ –practice (for example in relation to family feuds), which are all due to their differing cultural practices when compared to the mainstream population. (Asukasliitto RY, 2007; Oulun kaupunki, 2006; Pirttilahti, 2000).

Because of the limited space, more thorough examination of this phenomenon of higher mobility of housed Gypsies, Travellers and the Roma, or as I would call it “*modern nomadism*”, will be left to future papers.

To conclude; the differing cultural practices and unwillingness to assimilate, in areas of housing, are deteriorating the well-being of Finnish Roma and Gypsies and Travellers in England. Different policies designed to integrate or assimilate these communities, have in certain amounts just created new ways of expressing their “way of life”, as can arguably be seen within the phenomenon of “*modern nomadism*”.

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Considering the Impact of Illegal Food Cultivators: A Critical Exploration of Guerrilla Gardening and the ‘Local Trap’

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Abstract

Illegal food cultivators, or ‘guerrilla gardeners’, are increasingly operating in and around neighbourhoods. They opt not to interact with authority, instead deciding to take direct action which could be considered unlawful. This paper explores two cases of illegal food cultivation in the English Midlands: F Troop, a group of guerrillas who cultivate food next to a dual carriageway, and the Women’s Group, which has created a community garden without permission. Both groups claim to have their respective communities at the heart of their action.

Whether undertaken legally or illegally, food production at the local level ‘is assumed to be desirable’ (Born and Purcell, 2006: 195). This paper explores the value of these illegal food production sites to the local residents. It takes an ethnographic approach to understanding the groups’ actions, their intentions and reasons for producing food locally. It identifies who has access to the produce and how the groups interact with the community. In investigating these two illegal approaches, we ask whether guerrilla gardeners who cultivate food locally actually benefit the nearby population or exclude them from the sites.

Keywords:

Guerrilla Gardening; Illegal Gardening; Urban Agriculture

1. Questioning Local Food Production

This paper aims to introduce the notion that local food production, desirable as it may initially seem (Born and Purcell, 2009), may not always benefit those originally intended. So far, studies have observed and interacted with projects that have conformed to regulation; critically assessing the value these food sites have for nearby communities (Hardman and Jones, 2010). However, no study has yet explored projects that fail to obtain official permission (Scott et al, under review). Some of these projects, such as the two discussed in this paper, claim to have the community at the heart of their cultivating actions.

Using a case study from Hardman’s (2011) exploration of guerrilla gardeners, and introducing another illegal group which operates a community garden, this paper investigates whether the two groups’ claims can be substantiated: do they help their communities and, if so, how? Or are they restricting access and using the sites for themselves?

We begin with an exploration of illegal gardening, before introducing a theoretical lens for the paper. Finally, through discussion with the local communities, we assess the extent to which these sites help their nearby residents. Ultimately we aim to address whether illegal local food cultivation offers any benefits for nearby communities; or are groups, like their legal counterparts, occasionally hampering access and failing to involve residents?

2. Gardening without Permission

In recent years the guerrilla gardening movement has received increased publicity and awareness, featuring in mainstream media and academic discourse. Guerrilla gardeners are networks of volunteers who occupy and alter space without permission (Hardman, 2011; Tracey, 2007). Richard Reynolds, the father of the modern UK guerrilla movement, simply labels the act ‘the illicit cultivation of someone else’s land’ (Reynolds, 2008: 16).

The origins of guerrilla gardening stretch far into our past and are almost impossible to determine. However, the modern movement began in New York City (Hardman, 2011). In 1973 the ‘Green Guerillas’ (one ‘r’) formed a grassroots movement, initially using seed-filled-condoms to beautify inaccessible abandoned spaces (Paul, 2009; McKay, 2011). The group continued its underground war, developing new techniques and growing larger. Today the ‘Green Guerillas’ have rebranded themselves; now more mainstream and less covert, they aim to educate residents about the benefits of community gardening (Green Guerillas, undated).

The intentions of modern guerrilla groups vary dramatically: some may have political aims, whilst others just perform the act for fun and have no solid plans (Hardman, 2011). Defining who guerrilla gardeners are is particularly difficult, especially since some who practice the art, and are not attached to Reynolds’ network, are oblivious of their role (Hardman, 2009). Guerrilla ‘troops’ (a term often used to describe the groups) cross boundaries and include various organisations, networks and action groups: from businessmen searching for a hobby, to students bored with revision, there is a huge variety of individuals engaging in the activity.

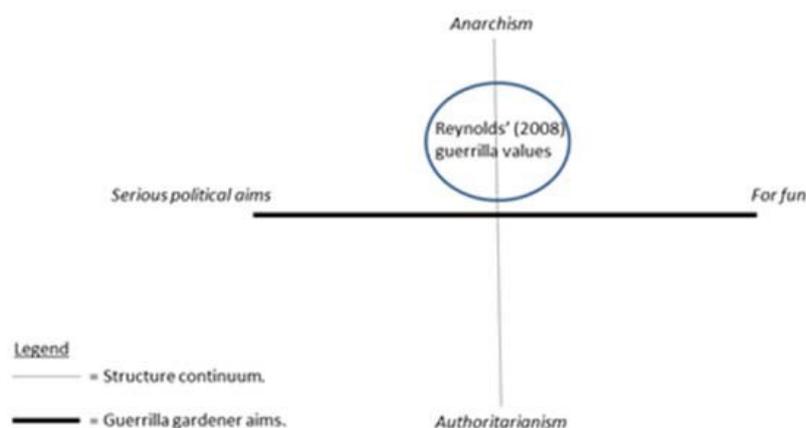


Figure 1: A spectrum of guerrilla troops (Hardman, 2011)

Hardman (2011), attempts to conceptualise the act of guerrilla gardening, in his spectrum of troops (Figure 1). The spectrum locates troops in a graph-like diagram in order to display their various aims and decision-making processes. However, this fails to identify the parameters for knowing whether a group is authoritarian or anarchist or whether they are operating just for fun or political motivations. Due to the nature of Hardman’s research, which uses an interpretive approach to understand the guerrillas’ views (Denzin and Lincoln, 2005; Hardman, 2009; Hardman, 2011; Marshall and Rossman, 2010; Merriam, 2009) it is virtually impossible to rigidly quantify or situate these opinions, feelings and thoughts in such a diagram. Hardman’s spectrum should therefore be seen as a loose guide to understanding the purpose of guerrilla action, rather than an end product that rigidly defines a group.

This paper will explore two guerrilla gardening groups operating in the English Midlands, which are placed at the opposite ends of the ‘illegal spectrum’. F Troop, a group of council employees who cultivate vegetables at the side of an inner-city dual carriageway, is conscious of its guerrilla gardening role and actively pursues the act of gardening without permission.

The other example is a group which operates from a community centre. The latter example altered the landscape to the rear of the centre without permission from authority or the landowner; the extent of the change is significant, creating approximately six vegetable plots. Perhaps the most interesting revelation regarding this group is that, although they fit Hardman's and Reynolds's description of a guerrilla gardener, members are unconscious of their actions and know little of the movement.

2.1 F Troop: Cultivating Vegetable in the 'Fast Lane'

F Troop comprises a roughly equal mix of males and females, some of whom regularly attend whilst others surface less frequently. This particular guerrilla troop is unique, in that it is entirely comprised of local authority employees. Ironically, they operate on council-owned land without permission. In essence, group members are living a double life; working for authority during the day, whilst on evenings donning gardening attire and, ironically, abusing their employer's land.

It becomes immediately apparent that, due to the nature of their 'day jobs', it was vital that we conformed to strict ethical guidelines, ensuring that the research would not reveal F Troop's identities. One such restriction involves not disclosing the precise location where F Troop conducts this unlawful action. Evidently, if this location was to be disclosed, then the authority employing these individuals would be revealed.

We adopted an observation role for the majority of the investigation. As discussed above, the practice of these guerrilla gardeners can be considered illegal. As a field researcher representing an institution, it was important to understand how F Troop's actions could potentially endanger the investigators and/or their University. Under current UK legislation, in order for a criminal act, such as theft, to be committed, the item(s), or land tampered with, must be considered a form of 'property'. The definition of property is fuzzy, since according to the Theft Act (1968) anything considered 'wild' is not property. However, F Troop is still committing a criminal act: the unlawful element arises with the 'severing' of authority-owned land and the uprooting of existing vegetation, roots and all.

Although this unlawful deed is rather minor, and to this date no UK guerrilla gardener has been arrested, we were still conscious that F Troop's digs could result in members facing legal action (Hardman, 2011). Evidently, it would be simple for the researchers to remain behind office desks and merely post multiple questionnaires to F Troop's members; there would then be no need to attend any of these illegal digs. However, this approach would be entirely subjective, and probably unproductive: adding the observation element, integrating a researcher with F Troop, allowed much greater understanding of the troop's actions, thoughts and ambitions (Denzin and Lincoln, 2005; Jorgensen, 1989).

We were aware that, by adopting this observation role and attending digs, the field researcher would be witnessing an illegal act. Even without participating, he would have a moral obligation to report such activity to authorities. This legal issue is by far the largest ethical consideration in the project. There was a requirement for the researcher to consider this, decide what was morally right (Frankena, 1973) and tailor the techniques and overall method around this ethical concern (Marshall and Rossman, 2006).

F Troop predominantly garden for fun, preferring to avoid interacting with the local authority and finding enjoyment through the unlawful element (Hardman, 2011; Scott and Hardman, 2011). The troop's main aim is to revitalise an under-used stretch of space located beside a busy inner-city dual carriageway, through the planting of flowers and vegetables (Collins *et al.*, 2011). The troop's leader aims to encourage others to grow food in the city; to think outside the box and consider the idea of urban agriculture.



Figure 2: F Troop members in action (Hardman, 2011: 11)

The guerrillas predominantly conduct their digs during summer months and attempt to maintain the patches during the week, on members' daily commutes to work. Since F Troop cultivates during daylight hours (Figure 2), members receive a considerable amount of attention from passers-by. The dig space sits in a through-route for nearby students and employees making their way to work. However, the majority of those interested are patrons of a nearby pub.

During the first two digs in 2010, pub customers, and the landlady, would watch F Troop from afar. In 2011, F Troop's leader forgot to bring enough water for the plants and thus turned to the pub for resources. This initial dialogue resulted in the pub owners and patrons taking further interest in F Troop's activities. A rapport soon developed between the pub and F Troop, which would retreat to the free house following a dig; obtaining free refreshments whilst chatting with the locals who, in turn, vowed to ensure that the dig site remained litter-free.

2.2 The Women's Group: Guerrilla Gardeners in Disguise?

The second group with which the researcher interacts is an assemblage of women who cultivate crops at the rear of a council community centre in the Midlands. This particular group will be referred to hereafter as the 'Women's Group', as the group's leader and several members of the public used this term throughout observation and interviews. The community centre acts as a hub for the surrounding residents, providing the local population with entertainment, information and, over the last three years, a 'community garden'.



Figure 3: Site progression; from the initial plot digging to the present-day beds (author's photographs)

The community garden was established to supplement a fortnightly lunch held by the Women's Group. Originally a mundane piece of grass located to the rear of the community centre; in 2008 the space was transformed to accommodate organic food growing (see Figure 3). The community garden was partially funded by a local primary care trust, which provided training for the Women's Group members along with a few plants and initial guidance to get the group started (Hardman and Jones, 2010). Funding also stretched to cover the cost of a fortnightly 'community lunch' providing residents with fresh produce from the grow site for small donations (residents could choose not to donate).

Initially we approached the centre to conduct a year-long observation; presuming that, since the project received funding, the Women's Group had obtained permission to alter the council-owned patch of grass. To the researcher's surprise, after eight months of observation it was revealed that the Women's Group had created the site entirely without consulting the local authority. The Women's Group leader, who originally started the community garden, stated that the process would have been too long and arduous. This individual wanted the action to happen there and then, without any delays.

In the same manner as F Troop, the Women's Group has tampered with council-owned land. However, this particular group goes one step further, digging six large plots and erecting several structures on the land. The plots are sizeable and required machinery to create the large square-like shapes. According to Scott and Hardman (2011), who investigated a variety of illegal land-use projects, any substantial material change of terrain requires planning permission. In this context, since use and form of the land has been altered entirely, we argue that permission would have been required. Nevertheless, the Women's Group leader opted not to investigate the matter further and went ahead with digging the plots regardless, without permission from the local planning department.

Considering the revelations above, one could argue that the Women's Group is performing the act of guerrilla gardening, given Reynolds's definition of guerrilla gardening as the 'illicit cultivation of someone else's land' (Reynolds, 2008: 16). The researcher argues, and illustrates through his discussion, how the Women's Group consciously partake in the act: cultivating land without the landowner's permission. The awareness exhibited by group members is, evidently, similar to that of those who are part of F Troop:

'To some, cultivating land without permission is so straight-forward and uncomplicated that they have no even considered that what they do is rebellious or that they are part of a global guerrilla movement'

(Reynolds, 2008: 24)

One does not need to be conscious of guerrilla gardening to inadvertently be part of the movement (Hardman, 2009; Reynolds, 2008). In this case we argue that the Women's Group members are guerrilla gardeners, they have consciously altered council land without permission, and do not wish for any authority involvement in their action. They, like F Troop, claim to promote the ideology of urban agriculture and wider access to locally-produced food for the less affluent. Since we now define the Women's Group as guerrilla gardeners, the same ethical approach adopted for F Troop was used; the location and members of the Women's Group are not identified and the researchers ensured that other details remain undisclosed.

3. The 'Local Trap'

This paper has so far explored the notion of guerrilla gardening and introduced two case studies of illegal food cultivation. On the surface, both of these groups' actions appear courageous and, even though illegal, appear to benefit their nearby communities. In both instances, the groups aim to educate and widen access to local food for local residents. We first investigate the real value of these two projects, beginning with a brief introduction to the 'local trap', a theory which criticises the general belief that local food is always the best option. We then critically assess the two case studies, focussing on the value of the two with respect to their communities.

Purcell and Brown explore the need to thoroughly investigate whether transferring power to the local is always the best option: in particular, they challenge 'the assumption that there is something inherently desirable about the local scale' (Purcell and Brown, 2005: 282). Practitioners and academics presume that providing power to the 'local people' will inevitably lead to more appropriate outcomes; this thought process and favouring of this particular scale is named 'the local trap' (Born and Purcell, 2006, 2009; Purcell and Brown, 2005; Purcell, 2005).

The local trap is especially relevant in the context of existing food systems. Global food systems are seen as undesirable (Purcell, 2005; Born and Purcell, 2006) whilst local-scale food systems, since they are not global, are assumed to be 'inherently desirable' (Purcell, 2005: 1924). These authors question the current assumption that producing food locally is attractive, whilst simultaneously claiming that academics are obsessed with the local scale (Born and Purcell, 2009).

The local trap idiom is not unique to the field of food studies; rather it is increasingly appearing in studies starting to question the local scale. Cummins, an author interested in neighbourhood health, expresses an interest in Purcell and Brown's concept of the local trap. He stipulates that even though the 'Local Trap lies in development planning and studies of urban democracy, the Local Trap concept can be usefully extended to contextual studies of population health' (Cummins, 2007: 356). Evidently, the notion of the local trap is applicable in a variety of studies. In this case and for the purposes of this paper, the local trap is relevant when questioning the actions of the guerrilla gardeners, who aim to practise cultivation at the local level.

The motives and aspirations of the groups were only truly realised when we began to conduct the intensive, year-long observation portion of the research. As Malinowski found, only through this meticulous passive-participant role were hidden, previously unknown details revealed. In the case of Malinowski's ethnography of a Trobriand Island tribe, his role enabled him to witness many practises of the tribal community. For instance, his description of the tribal economics revealed the formalities accustomed with the giving and receiving of material goods (Malinowski, 1922). In a similar manner, we were able to expose information

regarding F Troop and the Women's Group which, without the comprehensive observation, would probably have not been revealed. The following section will provide a review of the researcher's detailed observations and interviews; questioning whether the two guerrilla troops stood by their declarations, or neglected their duties.

4. Beyond Desire: Questioning the Action of the Guerrilla Gardeners

One imagines these food cultivating guerrilla gardeners to be modern crusaders, challenging the evil local authority, whilst providing resources and services to those who require it. We cannot help but be overwhelmed by F Troop's passion to flout the rules and revitalise a piece of underused land, or the Women's Group's aspiration to go ahead with the speedy creation of a 'community garden' without permission. However, as this section discusses, not all of the two groups' actions are positive.

We first had to identify who could be regarded as the 'local community'. This was achieved by locating those who lived and worked in close proximity to each site. The grounded theory concept of 'saturation' was then used to determine the number of interviewees (Glaser and Strauss, 1999). Evidently, adopting this approach provided a finite point, ending the research collection and enabling the eventual discussion of results.

The following section will explore the benefits and failures of these sites through a variety of headings. The core criticisms evoked through the local trap literature appear to focus on the management of land, particularly lack of community involvement (decision-making, participation) and restrictions on physical access. For the purposes of this short paper, two sections will concentrate on these points, whilst a third will discuss the reaction of the nearby community and their personal thoughts on the site.

4.1 Community Involvement

We begin with a discussion of F Troop's actions. After considerable discussion with the local community, contrary to F Troop's initial claims, the guerrilla group appears not to have interacted with the locals in its first two digs: 'patrons from the local pub seem interesting in the dig and approach the site a few times; keeping to themselves rather than interacting with the group' (researcher's field notes). We notice that F Troop operates in a tight pack; they speak with the occasional passer-by who takes notice in the group's actions. The close proximity of group members appears to deter the majority of passers-by from interacting; excluding them from the Troop's activities.

'No we just stood there watching them do it. As far as I'm concerned there was no conversation with me, to them. If they'd have spoke to me, I'd have spoke to them'.

(Male Staff Member)

Since F Troop's site is located in a commercial hub, the local community consists principally of users of a small, traditional pub situated towards the far end of the dual carriageway barrier. Interviews following these initial observations reinforce the suggestion that F Troop failed to live up to its ambition; members failed to interact with the local community and, at first, excluded the pub's staff and patrons from their actions.

In a similar manner, revelations also emerged about the Women's Group and their community garden. Contrary to the funder and Women's Group claims about the apparent communal space, we noticed that members of the Women's Group often referred to the garden as an 'allotment' (researcher's field notes). Reflection on previous field notes confirmed the realisation that Women's Group members appeared to take ownership of the

space; using the garden for their own personal uses. When the leader of the Women's Group was questioned about the name they used for the garden, she responded, 'Community garden, because if you call it an allotment you've got to have all sorts of permits and it just opens a can of worms' (Women's Group Leader).

Evidently, the original intention of the Women's Group was to establish an allotment. This revelation quashes the notion of the community garden, as clearly the grow space was not intended for the local residents. An allotment is typically a portion of land, restricted in dimensions and leased by the local authority or organisations, for the private production of food (Groundwork, 2011). In essence an allotment is a controlled space. The Women's Group leader realises the implications of having restrictions on plots and feels the application paperwork is exorbitant and unnecessary (researcher's field notes); preferring to avoid the indigestible masses of paper and securing the space by selecting a different option.

4.2 Access

Observation shows that access to the Women's Group community garden is restricted; a large black fence surrounds the space and the key is held by the group's leader, who excludes anyone undesirable. This discovery reinforces the suggestions that the Women's Group operates the site for personal use, yet community gardens are intended to widen access to produce for those residing near to the site (Local Government Commission, *c.* 2007). Unfortunately, in this instance, produce appears to remain restricted and inaccessible. Access can be sought either through a door located at the rear of the centre or the black gate, however, field notes reveal that both entrances are almost permanently closed, with the door and gate appearing to be locked during community lunches.

At the other end of the scale is access to F Troop's site. There are no fences, no gates nor any locked doors. The site remains open to passers-by and nearby community members. However, the produce cultivated by F Troop grows in soil potentially contaminated by the nearby dual carriageway. Although there is complete access to the site, this presents a danger to those who may pick and subsequently ingest the produce. In this instance, complete access poses a risk to the health of interested passers-by. The troop fails to take into consideration the need to warn curious passers-by about the hazards of eating the produce.

4.3 Community Reaction

The author's interviews with the community surrounding the Women's Group garden produced mostly constructive reactions. When residents were asked whether the local grow site was a positive addition to the community, respondents answered in a constructive manner: 'Fresh produce...good idea!' (Elderly Male); 'She cooks it from the garden you know, it's lovely, it's really nice' (Elderly Female); 'You can take them home if you want. We've just used some for cooking' (Young Female). These reactions suggest that the garden's immediate community is satisfied with the land-use change, from the once mundane grass surface to a set of raised beds.

The majority of F Troop's nearby community did not initially realise that vegetables were cultivated on the land adjacent to where they live, work or socialise. Yet, similarly, when they realised that food was grown in this area, locals had some positive responses: 'I was craving peas yesterday and went and brought some frozen ones. If I'd have known that I'd have gone out and picked them' (Young Male Pub Patron); 'Makes the area attractive and it's fed somebody' (Female Pub Patron). However, since F Troop's food arrangement was situated beside a busy dual carriageway, most of those interviewees appeared confused and

thought the idea of growing food in such an area was not appropriate. One nearby pub user, when asked whether he thought it was a good idea, responded ‘No, no no no!’ (Elderly Male Pub Patron). When asked to elaborate on his response, he merely stated that the area was not appropriate and locals would damage the produce, ‘I mean how can you put vegetables outside there? Really?’ (Elderly Male Pub Patron). This individual was not alone in their agitation over the positioning of F Troop’s produce: ‘Personally myself, I wouldn’t think that would be the right area for vegetables’ (Car Park Attendant).

5. Concluding Remarks: Who Benefits?

Over the year-long observation of both groups, it became evident that not all is as it first seems. Through the study, we have been able to dig deeper and reveal the impact of the guerrilla’s sites on their respective communities. The two case studies reveal that community involvement and use of the produce is almost non-existent. The Women’s Group prefers to operate the community garden as an allotment, using most of the produce for themselves, and passing only unwanted food to the community (researcher’s field notes). F Troop failed to tell the local community that produce was cultivated on the patch that had been adopted.

However, neither community had objections to the actions pursued by the guerrilla troops. Those who surround the two sites have no idea about the illegality of the troop’s actions. The interview data suggest that hesitation surrounds the location of where locally sourced food is cultivated. If, for example, the area was next to a busy dual carriageway, like F Troop’s plots, then the residents, when they were eventually notified, were aware that there is little protection around the food and, due to the radical nature of the site, opt against consuming the vegetables. On the other hand, since the Women’s Group grow space is less radical and appears - arguably - more mundane, the local population has no pressing issues. They appear to feel reassured by the fence protecting the vegetation and the raised beds that house the vegetables.

Evidently, more research is required on the benefits and need for local food, both in an illegal and legal context. In this instance, one could easily fall into the ‘local trap’; presuming that these two forms of grass-roots action, which claim to widen produce access for the nearby communities, are automatically beneficial. In reality, this paper reveals that not all of F Troop’s and the Women’s Groups’ actions are positive; rather some of their actions contradict their initial utopian claims that everything they do is for their community.

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The Impact of Knowledge Sharing on the Provision of Floating Support Services in Sheltered Housing

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Abstract

Organisations are constantly seeking ways of improving and delivering effective services through knowledge sharing initiatives. The ability of floating support officers to effectively share knowledge with other agencies such as adult social services can lead to improved service delivery. Literatures exist on the benefits and contributions of knowledge sharing to the success of organisation in different contexts. However, not much has been written on its impact on sheltered housing sector. The impact of knowledge sharing in the provision of floating support service for the older people in sheltered housing is presented and discussed. It draws on a thorough review of literature and highlights the impact of knowledge sharing in organisations. The findings indicate that leadership support, staff training, openness in communication, reward system and trust have a positive influence on how individuals within organisation share knowledge, thereby improving work performance. These results imply that individual work performance may be dependent on the effective use of knowledge sharing. It concludes that knowledge sharing can help build trust and motivation, and provides a way for individuals to share expertise.

Keywords:

floating support service, knowledge sharing, sheltered housing

1. Introduction and background

It has been highlighted in the literature that the creation and application of individual or organisational knowledge is vital to the survival of most businesses. Organisations are constantly seeking ways to better utilise the knowledge stored within it network. There is a general acceptance in business environments that knowledge is an essential organisational resources that gives business leverage and contributes to its successes (Nonaka and Takeuchi, 1995; Egbu, 2005). Knowledge, which ideally must be captured, shared and used has to be managed to ensured the implementation of the knowledge is accomplished. Organisations have to find solutions for the problem of how to manage knowledge most effectively to develop a competitive edge over their competitors and to make sure that all individuals, who are part of the organisation, share the same knowledge status (Awad and Ghaziri, 2004). There is much to be learned and understood about how knowledge is created, shared, and used in organisations (Grove and Davenport, 2001). De Long and Fahey (2000) grouped knowledge into various levels, individual, group and organisational level. Although, knowledge exists at many levels in organisations, the focus of this paper is the knowledge that exists with and within individuals and the impact of the process of knowledge sharing between individuals in providing floating support services to the older people living in sheltered housing.

It is worthy to note that leveraging knowledge is possible when individuals within an organisation are willing to share their knowledge while building on other knowledge. It is the individual within the organisation who can create, share and used the knowledge. This in turn

means that, individual's willingness to engage in knowledge sharing is essential for sustainable knowledge sharing activities. It has been argued that an organisation's ability to innovate depends largely upon the knowledge and expertise possessed by its staff. Grant (1996) points that it is the tacit knowledge, which cannot be easily communicated and understood, which will typically be of more value to organisations. However, It has been raised elsewhere (Egbu et al, 2001) the benefit and important role of tacit knowledge in organisation is limited, and as well as the role an individual plays in knowledge management processes.

Individual providing floating support services to older people living in sheltered housing have to liaise with other agency, such as adult social services to effectively provide floating support service. Interestingly, there is little evidence in the literature on the impacts of knowledge sharing in the provision of floating support services to the older people living in sheltered housing. This paper is part of a larger study that investigates the critical success factors of knowledge sharing practices in the provision of floating support for the older people in sheltered housing, which involved housing providers and local authorities' agencies. Using a case study approach, the main research will identify how the following factors- trust, leadership, reward, incentives and technology and training impact on the provision of floating support services in sheltered housing.

The objective of this paper is to gain an understanding of knowledge sharing, and the way in which knowledge sharing impacts upon the provision of floating support in sheltered housing for the older people. After the introduction and to the study, a description of floating support service in sheltered housing will be highlighted. Then background of knowledge sharing will be highlighted, closely followed by the role of knowledge sharing in floating support services. Finally the impact of knowledge sharing will be discussed.

2. Floating Support Services

Floating support services is one of the housing provisions offered to older people living in sheltered housing. It aims to assist individuals who are struggling to maintain their tenancy. Oldman (2008) defined it as housing related support to help individual to live and maintain their independent within the community. Floating support service is a service that provides housing support to vulnerable adults to enable them to maintain their independence while living in their home (Foord 2005 and Cousins and Saunders 2008). Its purpose is to sustain a tenancy through the development of independent living skills.

Sharpley *et al* (2002) points that it is a service that encourages interagency collaboration and acting as a bridge between services and co-coordinating the input among different agencies. While (Mullins and Murie 2006 and Cameron 2010) notes that floating support service developed as an alternative to traditional models of housing support provided to older individuals living in both accommodation base support and non accommodation base support. Invariably, floating support service respond flexibly to older individual needs and prevents crises or emergencies, it also helps in reducing housing management problems associated with rent arrears, abandonment and evictions.

Crellen (2004) highlights that floating support prevents problems that can lead to hospitalisation, institutional care or homelessness. It is also intended to help with the transition to independent living for those leaving hospital and care institutions. However, Lovatt and Whitehead (2006) argue while that floating support is capable of providing support tailored to the needs of the individual through a support plan, but it is difficult to meet these in a single approach, as individual have diverse need.

3. An Overview of Knowledge Sharing

The importance of knowledge in different levels of organisational settings has been acknowledged in the literature (Khamseh and Jolly, 2008). Knowledge Management (KM) is one of the important ways organisations identify, capture, use, store and share knowledge internally and externally. Mohanty, et al, (2006) notes that individual and group knowledge, and internal and external knowledge are several elements of organisational knowledge. Knowledge within organisation could be tacit knowledge, which resides within an individual and difficult to articulate or communicate externally. In contrast to explicit knowledge which is stored in an organisation's manuals, procedures, information systems and is based on practical skills and actions and it can be communicated easily with other people (Polanyi 1958, Nonaka and Takeuchi, 1995).

One of the processes of knowledge management is knowledge sharing, which is the act of knowledge dissemination and distribution through a specific channel. It can occur at various levels: individuals, groups, organisations or inter-organisations and provides a link between the individual and the organisation, while converting individual expertise into financial and competitive value for the organisation. Accordingly, many authors (Davenport and Prusak, 1998; Ipe, 2003 and Bishop et al.; 2008) have defined knowledge sharing from different perspective as a process which involves the exchange and voluntary dissemination of acquired skills and experience between individuals and across groups. Knowledge sharing is a process where individuals or groups exchange and share their expertise, skills and knowledge (tacit or explicit) to help solve a problem within or across organisations. Knowledge sharing can also occurs in organisation through interaction and people networks whereby face-to-face, luncheons or mediated through the use of information technology. However, De Vries (2006), points that ordinarily, individual will not willingly share their expertise or as much knowledge as the organisation would like them to share.

Therefore, knowledge sharing in the context of floating support services in sheltered housing is the act of making knowledge (tacit and explicit) available to other agencies involved in the provision of the services to the older people living in sheltered housing. It is the process by which knowledge held by the floating support worker, which includes the processes and procedures is converted into a medium that can be understood, absorbed, and used by other agencies, in this case, the adult social services to effectively deliver an efficient services to the older people living in sheltered housing. Knowledge sharing is important as it provides a link between the floating support worker and adult social services to effectively collaborate and share processes that enhances the services provided; thereby enabling the older people in sheltered housing to live independently without having to move into care homes. This degree of importance attached to knowledge sharing is heightened in knowledge asset, where knowledge is seen as a valuable resource for improvement and for gaining competitive advantage.

4. Knowledge sharing role in floating support services

Organisations have a knowledge capital which is stored within individuals, work routines and information systems. However, the difficult task for organisation is to be able to capture that knowledge and to leverage it throughout the organisation. This challenge has driven organisation to convert knowledge into a form which is accessible, easy to find and portable. This dynamic process of converting tacit to explicit is the starting point for knowledge formation within organisation. The need to leverage knowledge within organisations, is one of many tasks that organisations need to undertake.

In providing floating support services, the floating support workers share relatively explicit knowledge with other agencies such as the adult social workers through documentation of routines, manuals and electronically. However, for more tacit pieces of knowledge, experienced floating support worker play an important role by physically meeting with other agencies and sharing specific client knowledge. The knowledge required by floating support worker to effectively assess the needs of services users is considered to be tacit and it's also primarily based on experience. Knowledge sharing between floating support worker and adult social services has to be cost-efficient, ensuring that the same ideas are not recreated. It was stressed that knowledge sharing is one of the tasks of the floating support worker and that it is all about making sure that service user needs are met excellently.

Some scholars (Reid 2003; Riege 2005 and Cyr S and Choo 2010) have noted that managing knowledge sharing as a program involves a lot of strive and administrative work, together with specific incentives related to the program performance. Goal-setting and monitoring, rewards management and interdependencies with regular means of performance measurement were examples of managerial issues. As a consequence, there was little correlation between development of knowledge sharing performance and financial performance.

Floating support workers are not used to sharing their knowledge since they have generally relied on their individual achievements. In order to effectively share knowledge; some commentators (Wasko and Faraj 2005; Harris 2006; Cress *et al* 2007) have argued that building trust among parties involved is an important enabler to promoting knowledge sharing culture in sheltered housing.

5. Research methodology

This paper is part of an on-going PhD research entitled “Critical success factors of knowledge sharing practises in the provision of floating support services in sheltered housing for the older people”. The main study will employ a qualitative research approach, as the study is exploratory in nature and therefore fits with an inductive approach emphasizing the generation of theories, rather than testing current theories. The nature of the study is consistent with an interpretive epistemological position and a constructionist ontological orientation. Hence, a case study research strategy is particularly appropriate for this study as it involves the investigation of a particular contemporary phenomenon within its real life context. However, this paper is primarily based on a thorough review of relevant literature from journals, text books, conference proceedings in the areas of knowledge sharing, knowledge management and floating support service.

6. Discussions and findings on knowledge sharing impact in floating support services

The impact of knowledge sharing to organisations has been widely acknowledged to influence organisational performance in various aspects including management, decision-making and operational processes. It has been widely acknowledge that the acts of sharing is very important since an individual's knowledge will not have much impact on the organisation unless it is shared and made available to others (Nonaka and Takeuchi, 1995; Ipe, 2003 and De Vries, 2006). Knowledge sharing programme are an organisation's approach to how to manage its knowledge. The ability to share knowledge across organisations and employees has been found to contribute to organisational performance. The impact is of potential benefit to floating support workers in carrying out their roles especially

in the context of the providing housing support services to the older people living in sheltered housing.

Many authors have attempted to draw up a comprehensive list of the impact of knowledge sharing in different study contexts. Bishop *et al* (2008) in their study identified leadership, rewards, training and communication while Alawi *et al* (2007) in their study of organisational culture identified, trust, communication between staff, Information system, reward system and organisational structure as factors that can impact on effective knowledge sharing in an organisation. According to Sher and Lee (2004) knowledge sharing behaviours aid learning among individuals in an organisation and enable them to resolve similar problems encountered by others in the past, as a result enabling quicker responses to the service users. As in the case of a floating support worker who have to communicate and share important information with agencies to effectively provide the ender users an excellent service. Even though knowledge exists at different levels of an organisation, however, sharing of knowledge at the individual level is seen to be critical to an organisation. The exchange of knowledge between the floating support worker and adult social services generates competitive capabilities that can lead to the successful implementation of floating support services to the older people in sheltered housing.

Some commentators (Weerawarden and O’Cass, 2004 and Bishop et al.; 2008) notes that knowledge sharing between the floating support workers and adult social workers reduces cost and leads to faster responses to the changing needs of older people in sheltered housing. Knowledge sharing contributes to innovative practices by either borrowing from the prior experience of other people and organisations, or by searching for entirely new approaches and practices. Thus, sharing knowledge is an integral part of the provision of floating support services, leading to improvements the way the service is provided to the older people in sheltered housing. The exchange of experience and knowledge between the floating support worker and adult social services may lead to greater operational efficiency.

7. Conclusions

This paper has identified from the literature that there are many factors that can impact on the successful implementation of knowledge sharing in organisations, such as trust, interpersonal communication, interpersonal relationships, connective value, organisational structure and workplace environment and culture.

The impact of knowledge sharing within the context of social housing has multiple dimensions. It is viewed differently in various fields of activities. However, most organizations view knowledge sharing today as a competitive and unique tool to stay profitable while ensuring the growth and development of their employees. Sharing and capturing knowledge buried in individual and in organizations is the fundamental building blocks of knowledge management implementation. The knowledge of an organization is stored in the minds of its workforce. This workforce has to be motivated and empowered to contribute their best in fulfilling the mission and vision of the organization.

Knowledge sharing is so important as it encourages individuals in an organization to communicate effectively and clearly when disseminating knowledge to other members within a team. Knowledge sharing instills confidence in the workforce by way of empowerment and continuous education through effective communication. Effective knowledge sharing between floating support worker and adult social services strengthens relationships and sustains organizational competitiveness. When employees are knowledgeable, it instills in them confidence, and a good sense of direction to guide and lead others. Being knowledgeable is the first step in individual growth and development.

Knowledge sharing has been noted as a good way to effectively and efficiently sustain and transfer knowledge. Hence the paper has shown that effective knowledge sharing between floating support workers and adult social services can influence core knowledge as a means of improving shared intelligence, achieving improvement in process and services and effective decision-making.

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Adopting Activity-Based Costing Systems (ABC) in the Libyan Cement Industry: Methodological Perspective

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Abstract

The progressive use of advanced manufacturing technologies (AMT) has made traditional costing systems out of date by creating an overhead-intensive environment. Such systems are insufficient to allow organizations to compete successfully in the current business environment. Although recognizing the problem is a good beginning, the pressing need now is for a solution. ABC has emerged as the key alternative to traditional costing systems. However, there is a lack of empirical studies regarding the adoption of the ABC system in the world and no studies have been carried out in Libyan organizations and most of what has been written about it are theoretical studies. Moreover, research methodology is a key element in any thesis or dissertation. It refers to the choice and use of particular strategies and tools for data collection and analysis. According to this background, this paper will focus on determining an appropriate research philosophy and methodology for answering the main questions of an ongoing doctoral research ‘Why does the cement industry in Libya need to adopt the ABC system? Are the factors that assist in the adoption of the ABC system present in the cement industry in Libya? and How will the adoption of the ABC system will help the cement industry in Libya?’.

This paper could be useful for many researchers who are in the stage of identifying the research philosophy and methodology and this study could be used for many empirical studies on adoption of the ABC system.

Keywords

Activity Based Costing System, research methodology, research philosophy, cement industry, Libya.

1. Introduction

Recently, ABC has emerged as the key alternative to traditional costing systems. It recognizes that many overhead costs vary in proportion to changes other than production volume. By identifying the cost drivers that cause costs to change and assigning costs to products on the basis of cost driver usage, ABC can more truthfully measure the resources consumed by products. This cause and effect relationship provides a superior way of determining relevant costs. Moreover, ABC can be used for a range of cost management applications such as cost reduction, activity-based budgeting, performance measurement, benchmarking of activities, process management and business process re-engineering (Drury, 2006).

Hergert and Morris (1989) argued that the traditional costing system, primarily developed to measure true costs, has been bereft of significant innovation for the last 60 years, and is not able to provide the data required by the recent strategic planning frameworks of the 1970s and 1980s.

Berliner and Brimson (1988) pointed out that many organizations are struggling with important economic issues, such as how to improve product cost information, how to cost justify capital investments, how to change decision support tools like product-abandonment models and make/buy decisions, and how to revise performance measures that currently encourage only short-term productivity.

New developments have occurred in manufacturing technology. Most organizations use AMT, such as computer aided design (CAD), robotics, and flexible manufacturing systems (FMS). AMT has revolutionized the manufacturing shop floor and has dramatically changed manufacturing cost-behaviour patterns. Usage of AMT has caused overhead costs to rise dramatically and now go beyond direct costs.

It is not unexpected to find that direct labour accounts for only 8-12 percent of total cost at many factories. This trend is predicted to be even more pronounced in the factory of the future (Berliner and Brimson, 1988; Brimson, 1991; Kerremans et al., 1991).

Berliner and Brimson, (1988) and Brimson, (1991) stated that traditional costing systems do not sufficiently support the objectives of international competition and the AMT environment for several reasons: Firstly, the philosophy of absorbing overhead costs by allocating them on the basis of volume-related production has caused distortions in the overhead costs' allocation. Some products are overcharged while others are subsidized. Thus, profitable organizations lose out by overpricing and unprofitable organizations win through under pricing. Secondly, these organizations are overwhelmed by high overhead rates resulting from incorrectly traced costs, and they do not pinpoint the activities that generate avoidable costs rather than customer-perceived value. Thirdly, information obtained from traditional costing systems is usually poor for strategic cost analysis because it does not help the organization understand the behaviour of costs from a strategic perspective.

Based on the discussion above, ABC is one of the most important recent topics that the researchers are interested to study. Therefore, this study will focus on examining the factors that will encourage the cement industry administration to adopt the activity-based costing system in the cement industry in Libya.

2. Background on the Libyan cement industry and research problem

This study will be applied to the Libyan cement industry which is one of the most important industries in Libya. The importance of this industry is due to the fact that it produces cement, which is vital for producing concrete and construction materials for constructional development. It has been classified as the second largest consumed substance in the world after water (BCA, 2007). Cement plays a vital role in the building of modern civilizations; without it no school, house, road, hospital or bridge would be built. Therefore, this industry is one of the most important strategic industries in Libya after the oil and iron industry. Currently, Libya is witnessing an increased demand for cement as a result of the extraordinary rise in the building industry especially after the Libyan General People's Committee established the Housing and Infrastructure Board (HIB) in 2006 (GPC 2008).

The Libyan cement industry involves two companies: The Ahlia Cement Company (ACC) and the Libyan Cement Company (LCC). The Ahlia Cement Company was established in 1965 as a public organization under the name "Cement and Construction Materials

Company". In 1988 it was renamed as the Arabian Cement Company. In 2005, it changed from being a public company to being a private company as a share holding company under the name 'Ahlia Cement Company'. It has six plants: El-Mergeb (in Al-Komes); Suk Elkamis (in Tripoli); Lebda (in Lebda); Zliten (in Zliten); bags plant (in Al-Komes); and Alklata (in Tripoli); all of them are located in the western region of Libya (ACC, 2009).

The Libyan Cement Company (LCC) was a public company. In 2006 it changed to a private company as a share holding company. It started production in 1972 with one factory, but now has four plants; the Benghazi plant produces 800,000 tonnes of cement a year. The Hawari plant, which was established in 1978, produces a total of 1,000,000 tonnes of cement per year. In 1987, there were some adjustments made to the Hawari plant production lines, in order to produce sulphate-resistant cement, which was suitable for the construction of the man-made river project (World Report, 2004). Both the Benghazi plant and the Hawari Plant are located 30km south of Benghazi city. The third factory is the El-Fatayah factory, which was established in 1982 with two production lines that have a 1,000,000 tonne production capacity of ordinary Portland cement each year. This factory is located near Dherna city. LCC also has a factory that produces the cement packaging, which was established in 1975; in Benghazi city, this factory produces 200,000 bags per day. All these plants exist in the eastern region of Libya (LCC, 2009).

Through reviewing the literature of the subject of ABC, it has been observed that there is a lack of empirical studies regarding the adoption of the ABC system in the world and, none of these studies have been carried out in Libyan organizations. In addition, one of the researchers visited the Libyan cement companies in August 2010 and asked the directors of the financial departments about the cost accounting system which they use in their company. They stated that they are still using the traditional costing system and that they were not familiar with the ABC system. Therefore, the researchers decided to examine the factors that will encourage the cement industry administration to adopt the activity-based costing system in the cement industry in Libya.

3. Research aim and objectives

This study is part of on-going PhD research that aims to 'investigate the factors that will encourage the cement industry in Libya to adopt the ABC and provide recommendation to the administration in this industry'. The objectives of this study are:

- To review the literature in the area of ABC in order to have a deep understanding of the factors that will help organizations to adopt the ABC system;
- to identify a list of these factors to use in the field work in the cement industry in Libya;
- To conduct an empirical study to examine the key factors that will help the administration in the cement industry in Libya to adopt or not adopt the ABC system.

Research Questions

As the aim and objectives of this research need to be informed by a series of research questions, hence the following questions have been formulated to achieve these objectives:

- Why does the cement industry in Libya need to adopt ABC system?
- Are the factors that assist in the adoption of the ABC system present in the cement industry in Libya?
- How will the adoption of the ABC system help the cement industry in Libya?

4. Research Methodology

Chandler (2006) defined methodology as the main key to any dissertation. Research methodology refers to the choice and use of particular strategies and tools for data collection and analysis. In other words, research methodology is the systematic way a researcher uses to deal with the work undertaken using appropriate methods to collect and analyse data and to properly identify the issues to be discussed as well as the objectives of the research.

4.1 Research philosophy

The research philosophy reflects the way the researcher thinks about the development of knowledge which, in turn, affects the way the research is done (Saunders et al., 2007). There is no definite rule about which philosophy to select when doing research. It all depends on the nature and scope of the thesis, the research questions or hypotheses, and the constraints (Yin, 1994). There are two main research philosophies dominant in the literature: positivism and interpretivism or phenomenological (Hussey and Hussey, 1997). Easterby-Smith et al. (2008, p57) described positivism research thus: “The social world exists externally, and that its properties should be measured through objective methods, rather than being inferred subjectively through sensation, reflection or intuition”. Positivists prefer using statistical analysis of data collected by means of large-scale empirical surveys (Amaratunga et al., 2002; Gummesson, 2000; Morgan and Smircuch, 1980).

On the other hand, Easterby-Smith et al. (2008, p58) described interpretivism as ‘focuses on the way that people make sense of the world, especially through sharing their experiences with others via the medium of language’. According to Collis and Hussey, (2003; 2009) this philosophy does not consider the world to be composed of an objective reality, but focuses on the primacy of subjective awareness, concentrating on understanding the phenomena in depth to find an answer to the questions such as: what, why and how. Under this philosophy, the researcher is a part of what is being researched, and is not independent of it as in positivism philosophy.

Based on the nature of this research which focuses on meaning rather than measurement and because the researcher wants to gather rich information from the points of view of the study participants, based on their experience, in order to investigate the possibility of adopting ABC in the cement industry in Libya, therefore, the *interpretivism* philosophy will be adopted as the research philosophy.

4.2 Research Approach

Positivist and interpretivist philosophies are represented by two main types of research approach in social science, namely quantitative and qualitative (Easterby-Smith et al., 2008; Yin, 2003; Hussey and Hussey, 1997). A quantitative approach is often associated with the positivism philosophy which concerns counts and measures things (Collis and Hussey, 2003; 2009; Sutrisna, 2009; Easterby-Smith et al., 2008). Moreover, quantitative research is concerned with questions such as how much? How often? How many? (Gummesson, 2000).

Table 1: Key features of qualitative and quantitative research

<i>Qualitative</i>	<i>Quantitative</i>
<i>Uses small samples</i>	<i>Uses large samples</i>
<i>Concerned with generating theories</i>	<i>Concerned with hypothesis testing</i>
<i>Data is rich</i>	<i>Date is highly specific and precise</i>
<i>Reliability is low</i>	<i>Reliability is high</i>
<i>Validity is high</i>	<i>Validity is low</i>
<i>Generalizes from one setting to another</i>	<i>Generalizes from sample to population</i>

(Adopted and modified from Hussey and Hussey, 1997)

On the other hand, qualitative research usually emphasises words rather than quantification in the collection and analysis of data (Bryman and Bell, 2007). This notion is supported by Denzin and Lincoln (1998) who stated that the concept “qualitative” implies an emphasis on processes and meanings rather than numbers. Strauss and Corbin (1998) mentioned that the strengths of such a qualitative method lie mainly in its success in ascertaining deeper underlying meanings and an explanation of the phenomenon. Table 2 lists some of the key features of qualitative and quantitative research concerning the data collection method, as given by Hussey and Hussey (1997).

Hussey and Hussey (1997) stated that the main reasons for using qualitative methods are the nature of the research as well as the research philosophy. Saunders et al. (2009) mentioned that statistical analysis (quantitative research) requires a minimum sample size of 30. Consequently, according to this research philosophy the method used for this research is interpretivism which focuses on meaning rather than numbers and the research is interested in a deep understanding of the possibility of adopting the ABC system in the cement industry in Libya. The population of the study is less than 30 persons because the total of the employees within the top, middle and shopfloor level that undertake managerial accounting affairs within the Alahlia Cement Company and the Libyan Cement Company is around 22 persons. Therefore, *qualitative methods* are the most suitable methods to be used in this study.

4.3 Research Strategy

Saunders et al. (2007; 2009) defined the research strategy as a plan of how to answer the research questions which will satisfy the research objectives. Yin (2009) listed five different types of research strategies, summarised in Table 3. Yin (2009) also pointed out three conditions which can be used to select the appropriate strategy for research:

- the type of research question;
- the control of the researcher over behavioural events; and
- the degree of focus on contemporary as opposed to historical events.

Yin (2003; 2009) indicated that the case study is the appropriate strategy when ‘how’ or ‘why’ questions are being posed. This allows the researcher to determine not only what happened but also why it happened. He also recommended a case study strategy when the researcher has little control over the events and when the focus is on contemporary events. This research will answer the research questions: why does the cement industry in Libya need to adopt the ABC system? Are the factors that assist in the adoption of the ABC system present in the cement industry in Libya? How will the adoption of the ABC system help the cement industry in Libya? The event is contemporary and the researcher has no control over this phenomenon. Therefore, the case study strategy is suitable for this research. Yin, (2009, p18) defined a case study as “an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident”. In addition, many researchers like Saunders et al. (2007; 2009), Velde et al. (2004), Amaratunga (2002) and Bell (1999) confirmed that the case study is appropriate if the researcher wishes to gain rich descriptions and deep understanding of the context; it is a worthwhile way of exploring existing theory and will enable the researcher to dive into real life which can provide powerful insights. Moreover, one of the strengths of the case study strategy is that it allows the researcher to use a variety of sources and a variety of types of data as part of the investigation (Denscombe, 2003). Also, the case study is a preferred strategy for research studies which have a qualitative orientation (Brotherton, 1999).

Table 2: Relevant situations for different strategies

<i>Strategy</i>	<i>Form of Research Question</i>	<i>Requires Control of Behavioural Events?</i>	<i>Contemporary Events</i>
<i>Experiment</i>	<i>How, Why?</i>	<i>Yes</i>	<i>Yes</i>
<i>Survey</i>	<i>Who, What, Where, How many, How much?</i>	<i>No</i>	<i>Yes</i>
<i>Archival analysis</i>	<i>Who, What, Where, How many, How much?</i>	<i>No</i>	<i>Yes/No</i>
<i>History</i>	<i>How, Why?</i>	<i>No</i>	<i>No</i>
<i>Case study</i>	<i>How, Why?</i>	<i>No</i>	<i>Yes</i>

Source (Yin 2009, p. 8)

Based on the above discussion, the case study has been adopted as a result of the fact that it is the most appropriate research strategy for this research and to gain the depth of understanding of the information necessary to investigate the factors that will encourage the cement industry administration to adopt ABC in the Libyan cement industry.

Case studies can be conducted in one organisation (a single case study) or in more than one organisation (multiple case studies). Yin (2009) stressed that the single case study is an appropriate strategy to use when the case represents an extreme or unique case. Voss et al. (2002) believed that although a single case study offers greater depth of understanding it has limitations on the generalisability of the conclusions drawn. Yin (2009) argued that researchers, who prefer to adopt a single case study as a research strategy, need to have a strong justification for this choice. However, Yin (2009) and Lee (1992) observed that multiple case studies are more common and are generally used to replicate findings or support theoretical generalisations. Indeed, multiple case study research increases external validity and it helps to protect against observer bias (Voss et al., 2002; Leavy, 1994). As a result of these considerations, it was decided that the appropriate research design for the present study would be a multiple case studies (Ahlia Cement Company and the Libyan Cement Company) replicating the same phenomena under different conditions.

The multiple case studies strategy has two types of design; multiple holistic case studies which involves a single unit of analysis and multiple embedded case studies that involves multiple units of analysis (Yin, 2009). In this study, *multiple embedded case studies* have been selected. This will involve multiple realities at senior management, middle and shop floor management level, which could provide data to enrich the findings.

4.4 Data Collection

Data within a case study can be collected from secondary or primary sources or from both of them. Secondary data refers to information which already exists, for example, archival records, company documentation, publications (books, articles, etc) and annual reports, and may be available in hard copy form or on the internet. Many scholars like Ghauri and Gronhaug (2005) and Churchill (1999) recommend that all research should start with secondary data sources.

Primary data refers to the collection of data through interviews, direct observation, participant-observation, focus groups, and questionnaire (Collis and Hussey, 2003; 2009).

According to Yin (2003), six sources of evidence are recommended for use in a case study which are as follows:

Interviews: one of the most important sources of information in a case study. They should be undertaken by conducting a personal interview;

Documents: these provide specific details that can support verbal accounts, and they can be letters, memoranda, agendas, administrative documents, newspaper articles or any document related to the investigation;

Archival records: these include service records, organisational records, lists of names, staff and payroll records, old correspondence and other such records;

Direct observations: this is a way of collecting reliable evidence, for example when a field visit is conducted during the case study;

Participant-observation: this technique has been most frequently used in anthropology or sociology studies where the researcher attempts to participate fully in the lives and activities of subjects.

Physical artefacts: these include technological devices, tools, instruments, or some other physical evidence that may be collected during the study as part of a field visit.

No single source of data has a complete advantage over the others; rather they might be complementary and could be used in tandem. Thus a case study should use as many sources as are relevant to the study, yet not all need be used in every case study (Yin, 2003). The choice of data collection can depend on the main research questions and the aim and objectives of the research, the research philosophy, the research approach and the research strategy (Hussey and Hussey, 1997; Easterby-Smith et al., 2008). In this research, a data triangulation approach will be adopted by using a variety of data resources such as interviews (primary data), documents and archival records (secondary data).

Collis and Hussey (2003) stated that interviews may be face-to-face, voice-to-voice or screen-to-screen, conducted with individuals or with a group of individuals. Moreover, according to Easterby-Smith et al. (2008) there are three types of face-to-face interviews. These are unstructured, structured and semi-structured interviews.

Structured interviews: use of questionnaires based on a predetermined and standardised or identical set of questions;

Semi-structured interviews: the researcher will have a list of themes and questions to be covered although these may vary from interview to interview.

Unstructured interviews: these are used to explore in-depth a general area of interest to the researcher. The basic goal is to put the interviewees at ease and allow them to express themselves.

In this research, the researcher will use *face-to-face semi-structured interviews* as the main method of data collection and documentation review; archival records and direct observations as the other source of evidence to enhance the research validity and reliability. The semi-structured interviews will be conducted with the employees from the top, middle and shopfloor levels who undertake managerial accounting affairs within the Ahlia Cement Company and the Libyan Cement Company.

4.5 Data Analysis

There are two main methods of analysing qualitative data; *quantifying* methods and *non-quantifying* methods (Collis and Hussey, 2009). Quantifying methods are used when the user has adopted mixed methodologies, both qualitative and quantitative data collection (Ibid). Collis and Hussey (2009) have divided quantifying methods into:

Informal methods: in these methods researcher often quantify data informally in the process of reducing or examining data covering such subjects as repetitive or patterned behaviours (Collis and Hussey, 2009);

Formal methods: researchers can quantify data formally by using content analysis or repertory grid technique.

On the other hand, *non-quantifying methods* are used when a researcher adopts an interpretivist (phenomenological) approach (Ibid). Collis and Hussey have involved five methods:

General analytical procedure by this method data can be analysed by six phases: identifying themes, coding, categorising and summarising;

Cognitive mapping is used to structure, analyse and make sense of written or verbal accounts of problems and this technique attempts to extend personal construct theory (Ibid);

Data displays are visual formats that present information systematically and the researcher can draw valid conclusions and take needed action (Miles and Huberman, 1994). Displays can be by networks or matrices;

Grounded theory is used where no preconceived theoretical framework exists;

Quasi-judicial methods are drawn from the legal profession and involve applying rational argument to interpret empirical evidence.

This research lies in the realm of interpretivist philosophy which focuses on meaning rather than numbers and will not use mixed methodologies (qualitative and quantitative data collection). Therefore, the data analysis lies under non-quantifying methods and will be analysed systematically by using *general analytical procedures*. The researcher will try to manage the data collection by using a software package (NVivo).

5. Conclusion

This paper represents a theoretical aspect of the research methodology of an ongoing doctoral study that aims to 'investigate the factors that will encourage the cement industry in Libya to adopt the ABC and provide recommendation to the administration in this industry'. Interpretivism has been adopted as the main research philosophy and found that qualitative approach is the most suitable method to be used for this study, because the population of the study is less than 30 employees. Multiple embedded case studies and a data triangulation approach are found as the most appropriate for the study. The data will be analysed by using a general analytical procedure through using a software package (NVivo).

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Preliminary Findings in the Identification of the Factors Causing Interpersonal Conflict in the Libyan Cement Industry

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Abstract

Recently organizations have become more complex and diverse in responding to globalization and to internal and external changes, and this makes them more vulnerable to different types of organizational conflict. One survey showed that managers spend more than 25% of their work time dealing with conflict. Therefore, conflict within organizations has received considerable attention in academia and industry. However, there is a lack of empirical studies on the subject of the factors causing interpersonal conflict (IpC) in countries around the world and most of what has been written about it, are theoretical studies. Further to this background a research methodology has been designed to answer the main research question for an ongoing doctoral study ‘what are the factors causing IpC in the Libyan cement industry?’ In addition, this paper will focus on presenting the preliminary findings from the inductive data that has been obtained from 40 semi-structured interviews, from documents and direct observation.

Keywords

Interpersonal conflict, organisational conflict, conflict management, research methodology, cement industry, Libya.

1 Introduction

Conflict is one of the aspects of human interaction. Therefore, conflict in organizations is an inevitable and unavoidable occurrence and has a negative outcome on the individual and the organization, unless properly managed (Wood et al., 2010; Tjosvold, 2008). In addition, these conflicts take up a lot of managers’ time at all managerial levels (Brooks, 2009; Luthans, 2008; Slocum and Hellriegel, 2007; Hitt et al., 2006; Al-Nimr, 1994). This idea is supported by Hitt et al. (2006: p. 436) who stated that

“One survey showed that managers spend approximately 25% of their time dealing with conflict. In some fields (such as hospital administration and management of municipal organizations), managers can spend as much as 50% of their time managing conflict. Managers rate conflict management as equal to or higher in importance than planning, communication, motivation, and decision making”.

Thus, many author have confirmed that conflict in all its different types in organisations is an important topic to focus on; that its importance increases over time (Luthans, 2008; Almusdy, 2007; Hitt et al., 2006; Hellriegel and Slocum, 2004), and that this may be due to the rise of globalisation and interdependence. The negative effects of conflict may deprive an organization from achieving its goals, may waste time and effort and can lead to a low quality of work (Hitt et al., 2006). On the contrary, sometimes conflict has positive effects and this might lead to improved problem solving or decision-making, to the stimulation of creativity and may increase productivity (Hellriegel & Slocum, 2004). This positive aspect of conflict

depends on how it is controlled and managed (Tjosvold, 2006; 2008; Almusdy, 2007; Hatch, 2006; Adomi & Anie, 2006).

Commonly, most authors divided OC into four types: intrapersonal, interpersonal (IpC), intergroup and interorganisational conflicts. This paper focuses on the second type of OC. The justification for choosing this type of conflict, and not the other types, will be addressed in the next section. IpC is a conflict that occurs between two or more individuals and identifying the factors causing conflict in any organisation is one of the most important stages of the process of conflict management. This idea has been supported by many scholars like Robbins and Judge (2008), Schermerhorn et al. (2005) and Rahim (2002).

The authors in 2011 studied the factors causing IpC from the theoretical side by analysing the relevant literature covering the concept of IpC in the past decade. They have listed the factors that cause IpC into two broad categories: personal factors and organisational factors. *Personal factors*: These arise from differences among individuals and can be divided into: individual differences, threats to status, lack of trust, and incivility. *Organisational factors*: these stem from the nature of the organisation and the way in which work is organised and divided into: limitation of resources, unfair treatment, role ambiguity, role incompatibility, organisational change, contradiction of goals, information deficiency and environmental stress.

2 Justification for Studying Interpersonal Conflict

The purpose of choosing IpC and not any other OC to study is because individuals are the main element in any organisation and without them organisations cannot exist. Newstrom (2007) stated that IpC is a serious problem for many people because it deeply affects a person's emotions. Also, Wood et al (2010) argued that IpC is a major form of OC that managers face, given the highly interpersonal nature of the managerial role. Moreover, this type of conflict can spread rapidly among individuals within organisations and its negative outcome has a strong influence on the parties involved in the conflict if it is not controlled (Rollinson, 2005). Adomi & Anie (2006) mentioned that IpC involves a relationship in which a sequence of conditions and events moves toward aggressive behaviour and disorder if not properly managed. Due to these elements, this paper will focus on studying the factors that cause IpC in the Libyan cement industry.

3 The Libyan Cement Industry and the Research Problem

The Libyan cement industry has two companies: The Ahlia Cement Company (ACC) and the Libyan Cement Manufacturing Joint Venture Company (JLCC).

ACC was established in 1965 as a public organisation under the name "Cement and Construction Materials Company". In 1988 it was renamed as the Arabian Cement Company. In 2005 it moved from the public sector to the private sector as a share holding company under the name 'Ahlia Cement Company'. It has six plants: El-Mergeb (in Al-Komes); Suk Elkamis (in Tripoli); Lebda (in Lebda); Zliten (in Zliten); a bags plant (in Al-Komes) and Alklata (in Tripoli); all of them are located in the western region of Libya (ACC, 2011).

JLCC was a public company under name of the Libyan Cement Company (LCC). In 2006 it changed to a private company as a share holding company under the Economics Social Development Fund (ESDF). LCC started production in 1972 with one factor but it now has four plants; the Benghazi plant produces 800,000 tonnes of cement a year. The Hawari plant, which was established in 1978, produces a total of 1,000,000 tonnes of cement per year. The

third factory is the El-Fatayah factory which was established in 1982 with two production lines that have a 1,000,000 tonne production capacity of ordinary Portland cement each year. LCC also has a factory that produces cement packaging which was established in 1975 in Benghazi city and produces 200,000 bags per day (LCC, 2008). Since 2008 the Libyan Cement Company Incorporated has been under the new management of the Libyan Cement Manufacturing Joint Venture Company (JLCC) that was established as a newly formed Libyan company by the Economics Social Development Fund (ESDF) and the Austrian based Asamer Group (which was chosen by a transparent and international assessment procedure to be the best partner to support the development of Libyan cement industry).

The General People's Committee (GPC, 2008) has stated that the production by the Libyan cement companies still does not cover the local Libyan market. Moreover, Alferjany (2004) argued that the Libyan cement companies have suffered, and are still suffering, from the phenomenon of conflict either between individuals, groups, departments and organisations. Thus, the factors that cause all types of OC in the Libyan cement industry need to be studied in greater depth.

The Libyan cement companies have consistently faced managerial, technical and financial problems which has lead to low productivity (IGB, 2001; Binsaoud, 2002). Based on the perceived relationship between productivity and conflict in organisations, this may be one of the managerial problems that has caused low productivity. Therefore, this research will focus on studying the factors causing IpC in the Libyan cement industry.

4 The need for the research

There are a number of factors which make this study a valuable area to investigate, these being:

4.1 The Importance of the Concept

The subject of the identification of the factors that cause IpC is considered as one of the most important topics to be investigated because these factors are considered to be one of the main stages in the process of conflict management (Wood et al., 2010; Al-Rajhi, 2008; Hitt et al. 2006, and Rahim, 2002). Moreover, Elmagri (2001) recommended that the factors causing IpC needed to be studied in Libyan organisations. This idea was supported by Alferjany (2004) who suggested that the factors of OC needed to be investigated in the Libyan cement industry in particular.

4.2 The Importance of the Cement Industry in Libya

The Libyan cement industry is one of the most important strategic industries in Libya after the oil and the iron industry. Currently, Libya is witnessing an increased demand for cement as a result of the extraordinary rise in the building industry particularly after the Libyan General People's Committee established the Housing and Infrastructure Board (HIB) in 2006 (GPC 2008). The Board focuses on implementing and overseeing housing and infrastructure projects, renovating and regenerating neighbourhoods that have under-developed areas, developing cities and villages to suit the needs of modern civil life, etc. Another factor that assists is that the government has offered low interest housing loans to individuals as well as construction cooperatives in an aim to refresh the building sector and promote economic development.

4.3 The Dearth of Empirical Studies

There is a lack of empirical studies on subject of the factors that cause IpC in countries around the world and most of what has been written as theoretical studies. As far as the researcher is aware, there is no study up until now addressing the factors that cause IpC in the Libyan organisations in general and in the Libyan cement industry in particular. Therefore, this research is expected to add knowledge to, and shed more light on, this environment.

5 Research Aim and Objectives

This inquiry is part of on-going PhD study that aims to ‘Identify the Factors that cause IpC in the Libyan Cement Industry’. The objectives of this study are:

- To review and critically reflect on the relevant literature covering the concept of IpC to understand the causal factors from the theoretical side;
- To conduct an empirical study in the cement industry in Libya;
- To create a validated list of the factors that cause IpC in the cement industry in Libya;
- To provide an explanation of these critical factors and their sources in order to provide recommendations to the administration of the cement industry in Libya for their reduction.

6 Research Questions

The purpose of the on-going PhD study is to answer the following questions about the factors that cause IpC in the Libyan cement industry:

- What is the level of IpC in the Libyan cement industry?
- What are the factors that cause IpC in the Libyan cement industry?
- Why do these factors exist in the Libyan cement industry?
- How could these factors be reduced?

However, the researcher would like to point out that the preliminary findings will be discussed in this paper will focus on answering the second question.

7 Research Methodology

The main purpose of research methodology is to explain how the research questions will be answered. It refers to the choice and use of a particular philosophy, an approach, strategies and tools for data collection and analysis.

The ontological philosophy of this study is idealism which refers to the fact that reality is not one objective but it is constructed by people differently. The interpretivism was selected as the main research philosophy that because the current study is focusing on meaning rather than measurement. The nature of this study is theory building rather than theory testing and this study intends to develop a theory inductively from data collection and analysis. Consequently, the inductive logic has been selected as the logic of this research.

Sutrisna (2009) and Easterby-Smith et al. (2008) confirmed that a qualitative method emerges from the interpretivism assumption that focuses on meaning rather than measurement. Several scholars (e.g. Ghauri and Gronhaug, 2005; Berg, 2006), under the scope of social research methods, have often suggested that a qualitative method is more suitable than a

quantitative one for researching into an event or social process which is difficult to meaningfully express (e.g. people’s experience or behaviour). Due to the nature of this study which focuses on employees’ experience and behaviour in the Libyan cement industry in the area of IpC and to the philosophy of this study. Therefore the qualitative approach is the most suitable one for this study.

According to Yin (2009), case studies are the preferred strategy when “how” or “why” questions are being posed, when the investigator has little control over events and when the focus is on contemporary phenomena within a real-life context. Thus, a case study research approach was chosen as appropriate for studying such a social setting.

A case study can be conducted in one organisation (a single case study) or in more than one organisation (multiple-case studies). Yin (2009) argued that researchers, who prefer to adopt a single case study as a research strategy need to have a strong justification for this choice. However, Yin (2009) and Lee (1992) observed that multiple case studies are more common and are generally used to replicate findings or to support theoretical generalisations. Indeed, multiple case study research increases external validity and helps protect against observer bias (Voss et al., 2002; Leavy, 1994). As a result of these considerations, a multiple case study approach was decided as an appropriate research design for the present study. As mentioned in section 4 the Libyan cement industry has two main companies working in this area, the ACC and the JLCC, both companies were utilised as cases studies in this research to gain an in- depth understanding of the phenomena.

The multiple-case studies strategy has two types of design: multiple holistic case studies which involve a single unit of analysis and multiple embedded case studies which involve multiple units of analysis (Yin, 2009). In this study, multiple embedded case studies were selected. This will involve multiple realities at senior management, middle and shop floor management level which could provide data to enrich the findings. Details of the three levels are given in table 1.

Yin (2009) suggested that six major sources of evidence can be used in the case study approach: documentation, archival records, interviews, direct observation, participant observation and physical artefacts. Denzin and Lincoln (1998) encouraged researchers to use more than one method and to recognise the value of using multiple methods for the corroboration of findings and to improve the validity of data. The present study combines face-to-face semi-structured interviews, direct observation and the examination of documents, aiming to benefit from the strengths of each method in order to obtain a wide variety of data, as well as gaining an in-depth understanding of the subject.

Table 1: The three levels of respondents

Managerial level	Identification details
Top management (TM)	Senior managers, deputy managers
Middle management (MM)	Heads of manufactories, heads of departments
Shop floor management (SM)	Ordinary employees and their supervisors

The total number of interviews undertaken was 50 in the two case studies: 29 in ACC and 21 in JLCC. Table 2 presents the target interviewees of the study in more detail. All interviews

were conducted between July 2010 and October 2010. The duration of each interview varied between thirty minutes and an hour.

The main challenge for qualitative data analysis is how the large amount of data which is gathered from different sources can be summarised and structured to arrive at meaningful conclusions. However, Braun and Clarke (2006) argued that thematic analysis offers an accessible and flexible approach to analysing qualitative data especially for students and those not particularly familiar with qualitative research, as it provides core skills that will be useful for conducting many other forms of qualitative analysis.

Table 2: The target interviewees

No	Managerial Levels	ACC	JLCC	Total
1	TM (senior managers and deputy managers in the headquarters)	1	1	2
2	MM (heads of departments and manufactories in the headquarters and in different manufactories)	7	5	12
3	SM (ordinary employees and their supervisors in the headquarters and in different manufactories)	21	15	36
Total		29	21	50

Therefore, the data was analysed by using thematic analysis (which some authors, such as Collis and Hussey 2003; 2009 call it general analytical procedure). It can be analysed through identifying patterns or themes, coding, categorising, summarising and interpretation. The analysis was organised in two stages: within-case analysis and cross-case analysis, which were recommended for multiple case study research by Ayres, et al. (2003), Creswell (1998) and Yin (1994).

8 Preliminary Findings

During the analysis of the qualitative data major themes came forward as follows: *The nature of IpC; the level of IpC; the indicators of the existence of IpC on this level; the causal factors of IpC; and reduction of the factors causing IpC.*

The main question of this paper is ‘what are the factors that cause IpC in the Libyan Cement Industry?’ and this present paper seeks to answer this question. Therefore, this paper will focus on presenting the preliminary findings of the fourth theme only, ‘the causal factors of IpC’.

The preliminary findings of this study showed that the factors causing IpC can be represented by the following factors:

- *Individual differences:* especially cultural differences and the age gap between employees;

- *Threats to status*: this emerged from some participants' expressions such as *'when I was appointed in this department, I faced many irritations from some employees because they thought that I would threaten their position in the department'*;
- *Incivility*: that appeared in the term *'members who agitate and cause disturbances'*;
- *Limitation of resources*: which was represented by limited training;
- *Unfair treatment* in the distribution of wages, rewards and training;
- *Role ambiguity*: that emerged from some interviewee expressions from JLCC such as *'in our department we do not have specific job for each one where any one can do the work'*. JLCC were still preparing the organisational structure of the company and job descriptions after the LCC integration with Asamer Group (Austrian building company) whereas ACC had not updated its organizational structure and job descriptions since 1989 (seen by reviewing documents);
- *Role incompatibility*: that represented a clash between the family role and the job role of employees. For example, one respondent argued that *'most employees needed to collect their children from school between 1.00pm and 2.00pm and they have a job at the same time. This can put the person in trouble with his boss or colleagues'*. This problem is considered one of the most common problems that facing Libyan society because of a lack of public transportation. This problem was also highlighted by Elorafi (2010) who confirmed that most Libyan employees in Libyan organisations had the problem of collecting their children from school during work time;
- *Organisational change*: which appeared strongly in the responses of the JLCC participants;

All the above factors were confirmed by what was found in the literature. However, the interviews with respondents also revealed that there are some other factors that cause IpC which do not exist in the literature and which can be considered as unique factors. They are:

- *Mismanagement*: one of the participants from the ACC stated that *'most units and departments need to pay attention to the administrative and organisational side, not just to the technical side as happens now. In other words, the company needs to put the right man in the right place, based on administrative and technical abilities not on tribal referentiality'*. The mismanagement of the organisational change was very clear in the JLCC, where all respondents confirmed that they were not informed about the merger process and it surprised everyone. Also, they confirmed that the integration between the two companies had been agreed by the General People's Committee (representing the Libyan government) in order to improve the production rates of goods and to receive tangible benefits from foreign expertise;
- *The tribal bigotry or the tribal tendency of some individuals*. For example, one respondent noted that *'one of the factors contributing to conflict, from my point of view, was because some employees dealt with others in an arrogant manner because they were from a large tribe or because they felt that their tribe had social status. This behaviour could lead to tension and resentment between the parties which may result in strong conflict between the parties for trivial reasons'*;
- *Contradiction between the organization's policy and the state's laws*: four of the JLCC respondents (two from the TM and the other two from the MM) explained that JLCC suffers from the fact that the policy of the company contradicts with some Libyan laws such as Law Number 15 of 1981 which prevents giving Libyan

employees a salary of more than 750 LD for the purpose of achieving social justice amongst all the segments of society.

9 Expected Contributions to Knowledge

There is a lack of empirical studies on subject of the identification of the factors that cause IpC in countries around the world and most studies have focused on managing IpC and OC. Thus, the main contribution to knowledge by this study is to fill the gap in the literature on the subject of the factors that cause IpC by conducting an empirical study in the Libyan environment. As far as the researcher is aware, this study is the first conducted in the Libyan context where no previous empirical research has been undertaken to investigate the factors of IpC in the Libyan environment. It is, therefore, an original study in this area.

The main contribution to knowledge that was found in this study was the identification of three unique factors causing IpC in the Libyan cement industry. These factors have not been mentioned before in the literature, as explained in section nine.

10 Conclusion and Further Research

This paper has tried to provide an answer to the main question of on-going PhD study ‘What are the factors that cause IpC in the Libyan cement industry’ by analysing qualitative data that came from 40 face-to-face semi-structured interviews, from direct observation and documentation, and by using multiple embedded case studies as the main research strategy (at the senior management, middle and shop floor management levels within ACC and JLCC). The data was analysed by using a thematic analysis in two stages: within-case analysis and cross-case analysis; these are both suitable for organising data especially if the researcher has used multiple case studies as a research strategy.

The main preliminary findings of this study showed that individual differences, threats to status, incivility, limitation of resources, unfair treatment, role ambiguity, role incompatibility, organisational change, mismanagement generally and mismanagement of organisational change particularly, tribal bigotry and the organization’s policy where it contradicts with the state’s laws are the main factors that cause IpC in the Libyan cement industry.

Due to the different Libyan environment, both culturally and politically, it has been found that three unique factors also cause IpC in the Libyan cement industry and this discovery is the main contribution to knowledge by this study.

Finally, the researcher recommends other scholars to study, as a theoretical or empirical study, the other factors that cause OC, such as identifying a list of factors causing intrapersonal conflict, intergroup conflict and interorganisational conflict which, in turn, can give opportunities to many researchers for further study on managing each different kind of OC.

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Leading the Change Towards Sustainable Practices in UK Construction Organizations

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Abstract

The issue of sustainability is growing ever more important in the development of built environment assets. Maintaining a balance between economic success, environmental protection and social responsibility is fundamental to the long term survival of every organization in the built environment. The pursuit of sustainability is common with the implementation of any major organizational change and therefore requires committed organizational leadership. The construction industry therefore needs leaders that can develop a culture that supports, promotes and rewards the delivery of organisational strategies for sustainability.

This research examines the role of organizational leadership in promoting sustainable practices in construction organizations. This issue is a strand of work within an ongoing PhD study looking to develop a framework for promoting sustainable construction practices through leadership in construction organizations. A qualitative study with fifteen (15) leaders in UK construction organizations, including sustainability directors, managers, consultants etc. is presented. The analysis of the collected qualitative data revealed that, one major driver for construction organizations in pursuing sustainability is to win more jobs to remain in business. The leadership role in promoting sustainability in construction organizations includes the development of strategies and formulation of policies. Surprisingly, the perception that sustainability cost more is still seen as a major challenge to the adoption of sustainable practices according to the findings from the interview. The results from this phase of the study indicate that further data are required to enable a more grounded conceptual framework of factors affecting leadership and sustainability in construction organisations to be developed.

Keywords

Leadership, style, construction organization, sustainable practices

1. Introduction

Leadership is vital in the construction industry and a key success factor in the drive towards sustainability (Ofori and Toor, 2008). Construction organizations need leadership that provide the collective vision, strategy and direction towards the common goal of a sustainable future. Leadership should embed sustainability in their organizational activities and make sustainable development part of their overall business strategy. It is important that such leadership have both the ability as well as the sustainability knowledge to effectively guide their organizations strategically towards sustainability.

The role of leadership in improving the performance and innovation in the construction industry has been receiving increasing attention in recent times (Bonssink, 2007). However,

less attention has been given to the capability of organizational leadership in promoting construction organizations towards the delivery of sustainable construction projects. There is extensive literature on the subject of sustainability and leadership as separate entities; however, little has been written about the link between leadership and sustainability in construction management research. The issue of sustainability is growing ever more importantly and construction has perhaps the greatest impact on it than any other sector. The construction industry provides benefits to the society as well as causing negative impacts; this makes it a key sector in the fight for sustainable development (Sev, 2009).

The construction industry is a very important sector in achieving society's sustainable development goals; however the change towards sustainability is a process that presents a leadership challenge. Both Egan (1998) and Latham (1994) called on leaders to lead the quest for change in the construction industry. Leaders have an important role in guiding construction organizations toward sustainable practices and it is believed that such leaders require unique leadership styles. Leadership style is all about how people interact with those they seek to lead (Groetsch and Davis, 2006). However, Toor and Ofori (2008) believe that leadership is about authenticity and not style.

The role of leadership and the promotion of sustainable construction practices in construction organizations in United Kingdom (UK) is critically examined in this paper. The first part of the paper reviews literature on sustainable construction, leadership styles, drivers and the challenges facing leaders in the effective implementation of sustainable construction practices. The paper concludes with the findings from Preliminary interviews conducted with sustainability leaders in UK construction organizations.

2. Literature Review

2.1 Sustainable Development and Construction

Sustainable development that balances social, environmental and economic objectives is now firmly on the agenda for the UK construction industry (Raynsford, 2000). Sustainable development balances environmental resource protection, social progress and economic growth and stability now and for the future. Sustainable development has been defined in many ways; Parkin (2000) pointed out that there are well over 200 rumoured definitions of sustainable development in circulation, however, the most widely accepted definition is:

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs”- From ‘Our common future’ (The Brundtland Report, 1987:43)

Sustainable development means delivering built environment that sustains and improves the quality of life for human beings; removes the environmental and social damage from the past. Sustainable development also improves the sustainability of the wider environment, ecosystems and development of individuals and society's quality of life (Bennett and Crudginton, 2003). Sustainable development involves minimising the negative impacts of our activities to improve the environment and enhance a better quality of life for present and future generations. It is all about balancing economic growth and progress while protecting natural resources and promoting social equality (Leiper *et al.*, 2003).

The quest for sustainability has put enormous pressure on the construction industry from the government and the general public to improve on its currently unsustainable pattern of project delivery (Adetunji *et al.*, 2003). There is now a wide recognition that the construction industry has a vital contribution to make towards sustainable development. However, Leiper *et al.*, (2003) comment that, the construction industry is also slow in adopting sustainable approaches in its construction project practices. The construction industry has a significant

social responsibility to minimise the damage its projects do to the social environment. Sev (2009) also add that both existing built environment and the process of adding to it have several environmental, social and economical impacts.

Sustainable construction is the application of sustainable development principles in the construction industry. Parkin (2000), describes sustainable construction as a construction process that incorporates the basic themes of sustainable development. Sustainable construction aims at reducing the environmental impact of a building over its entire lifespan, providing safety and comfort to its occupants and at the same time enhancing its economic viability (Addis and Talbot, 2001). Sustainable construction is conceptualized as having three broad dimensions; social equity, environmental protection, and economic growth as a reflection of those issues in relation to sustainable development. Social sustainability deals with legal, moral and ethical obligations of construction organizations to their stakeholders. Environmental sustainability on the other hand addresses the impact of construction activities on the environment by minimising waste, using natural resources and energy efficiently. Economic sustainability, however involves improved project delivery resulting in high productivity to maintain a high and stable level of economic growth (Parkin *et al.*, 2003).

Sustainability makes good business sense because it is of increasing importance to the efficient, effective and responsible operation of business. Some of the primary drivers towards the adoption of more sustainable business practices in construction organizations in UK is government policy or legislation, reputation and competitive advantage (Bennett and Crudginton, 2003; Woodall *et al.*, 2004; Holton *et al.*, 2008). In a qualitative study by Williams and Dair (2007) involving five (5) case studies of completed developments in England, they identified a number of barriers to sustainable construction practices, including; lack of consideration of sustainability measures by stakeholders, sustainability not being required by clients, real and perceived costs and inadequate expertise and powers.

2.2 Leadership

Leadership is believed to be an important factor in achieving business success in any organization. Despite the extensive research carried out on leadership, Giritli and Oraz (2004), in their survey of leadership styles of construction professionals in Turkey, argued that, leadership is one of the least-understood concepts in business. Jing and Avery (2008) added that, despite the prevalent appreciation of the importance and value of leadership, the concept of leadership still lacks lucidity and agreement in leadership literature. In Odusami *et al.*, (2003) quantitative research involving sixty (60) questionnaires surveyed the relationship between project leadership and construction project performance. It was also pointed out in the survey results that, not much work has been done on leadership in the construction industry.

Leadership has a very significant influence on organizational activities including sustainability yet leadership has not been a focus of research in the field of sustainability. The study and the understanding of leadership and its relationship to sustainability is still in its early stages (Egri and Herman, 2000; Quinn and Dalton, 2009). Little or no research has been done linking leadership and sustainability in the construction industry in particular. Even though, the field of leadership is well researched, Chan and Cooper (2007) conducted research through in-depth interviews with fifteen (15) leaders of the UK construction industry. The work revealed that, the understanding of construction leadership is to some extent primitive, compared with the rather mature developments of mainstream leadership theories. The interest and the significance of organizational leadership is increasing rapidly as a result of the need for organisations to innovate continuously to meet the current changing business environment.

Despite the wealth of knowledge built around the concept of leadership, there is no single definition of leadership; however, a view of leadership according to Doh (2002) is that it is an executive position in an organization and a process of influence. Leadership is also said to be concerned with the ability of an individual to influence the behaviour of others in order to deal with the desires of the leader (Fellows *et al.*, 2003). Ferdig (2007) describes leaders as those who inspire a shared vision, build consensus, provide direction, and foster changes in beliefs and actions among followers needed to achieve the goals of an organization. Northouse (2010:3) however define leadership as:

“A process whereby an individual influences a group of individuals to achieve a common goal”

Leaders are essential at all levels (Munshi *et al.*, 2005) and can emerge at different levels of an organisation (Newton, 2009). Ferdig (2007) add that leadership is extended to any one who seeks sustainable change regardless of the role or position, and such leaders can connect with others using different assumptions about how people work together to create meaningful change. From the definition of leadership above, anyone in an organisation could potentially be a leader at some point in time if they are involved in a process of influence that involves encouraging sustainable practices (Taylor, 2008). The construction industry in general and the UK construction industry in particular, is in an era of a difficult socio-economic, cultural, political, and business environment. There is an urgent need to promote a positive culture in the construction industry and the industry require leaders with positive values and good levels of moral and ethical behaviour to change the existing conservative paradigm of management in the industry Toor and Ofori, (2008).

2.3 Leadership Styles

Leadership have an important role in guiding construction organizations toward sustainable practices and it is believed that such leaders require unique leadership styles. Leadership style is all about how people interact with those they seek to lead (Groetsch and Davis, 2006). However, Toor and Ofori (2006) describe leadership style as a combined outcome of the leader’s self-related cognitive information, personality traits, the primary motives, and thoughts on operating situational variables. Style is an important part of leadership but no single leadership style is best for all situations. There has not been any evidence to show that one particular leadership style is the best (Vecchio, 2002; Giritli and Oraz, 2004). There are different types of leadership styles, each proving effective depending on the given circumstances, attitude, beliefs, preferences and values of the people involved.

Many styles of leadership have been proposed for organizational leaders including; transactional, transformational, charismatic, democratic, servant, autocratic, consultative, laissez faire, joint decision making, authoritative, participative, tyrant, task oriented, relationship oriented, production-oriented, employee-oriented, delegating, authority-compliance, impoverished management, team management (Toor and Ofori, 2006). According to Bossink (2007), charismatic, instrumental, strategic, and interactive leadership styles influence an organization’s innovativeness towards sustainability. The charismatic leadership style communicates vision, energizes others, and accelerates innovation processes such as sustainability. An instrumental leadership style structures and controls the sustainability improvement processes, while a strategic leadership style uses hierarchical power to innovate.

Finally, it is suspected that the interactive leadership style empowers employees to innovate sustainably and to become sustainable leaders themselves (Bossink, 2007). Transactional leadership helps organizations achieve their current objectives more efficiently while Visionary leaders (transformational, charismatic) create a strategic vision of some future to

achieve high levels of cohesion, commitment, trust, motivation, and hence performance in the new organizational environments (Zhu *et al.*, 2005). Avery (2004) describe visionary leadership as leaders who employ a collaborative style for making decisions, share problems with their followers and seek consensus before the leaders make the final decision.

2.4 Leadership for Sustainable Construction

Sustainability requires organizational leadership to take bold steps to move beyond efficiency, compliance or just being green, to a higher level of performance. Sustainability is now viewed by organizations as being part of a strategy for long-term business survival and success (McCann and Holt, 2010). Parkin (2010) emphasises the link between leadership and sustainable practices when she asserts,

“Leadership is a vital ingredient for achieving sustainability. Without it sustainability will never make it in government, business or anywhere” (Parkin, 2010:89).

Organizations are now required to fundamentally change the way they operate from focussing on the short-term maximization of shareholders value to now pay attention to the economic, social and environmental effects of their operations (Quinn and Baltes, 2007). Leaders have a significant role to play in the construction industry as the industry undertakes its critical role in the efforts to attain sustainable development (Ofori and Toor, 2008). It is suspected that the ability of organisations, irrespective of their level of maturity, to pursue the sustainable agenda is influenced by the commitment and conviction of their leadership approach towards sustainability. Leaders should communicate the importance of sustainability and establish a culture of integrating sustainability into day-to-day management decisions (Avery, 2005). Construction organizations therefore need leadership that provide the collective vision, strategy and direction towards the common goal of a sustainable future.

A qualitative study by Quinn and Dalton (2009) using structured interviews, sampled leaders from organizations that formally adopted sustainability practices and found that sustainability requires the integration of social, economic and environmental issues fully into the vision, values and operations of all organizations. This requires leaders to reform redesign and restructure their organizations to incorporate sustainability values into the fabric of the organization to minimize their negative impacts. In contrast, Ofori and Toor (2008) believe that leadership is the key factor of success in the drive towards sustainability. They argue that, the solution lies in leadership that is self-aware, committed and able to earn the support, and direct the actions, of all stakeholders towards the pursuit of a common project related goal of sustainability. This was the result from a study involving interviews with 32 prominent leaders in the Singapore construction industry. In a survey to assess students' personal commitment to sustainability, sustainability knowledge, and interest in the topic of sustainability, it was found by Middlebrooks, *et al.* (2009) that as organizations and governments continue to underline a shift towards sustainable values and vision, then effective sustainability leadership will become increasingly important. Success with sustainability requires clear leadership at the organisational level, to identify, understand and manage efficiently ground-breaking solutions which address the critical social, environmental, and economic challenges faced by the world today

When implementing a business strategy that commercially incorporates sustainability, leaders must be able to understand the motivation of different stakeholders, and engage and partner with managers to weave sustainability into the fabric of the organizations. Leaders must also possess the ability to understand and overcome the challenges or barriers to adopting sustainability (Lueneburger and Goleman, 2010). Sustainability leaders should not just give directions but should also develop and implement actions in collaboration with others,

adapting to unforeseen changes in the environment overtime through modification as when needed (Ferdig, 2007).

3. Research Methodology

The study adopts a qualitative research approach using an in-depth semi-structured interview with sustainability leaders in construction organizations. Fellow and Liu (2003) argue that, interviews are useful to obtain detailed information about personal feelings, perceptions and opinions. A semi-structured interview involves the implementation of a number of predetermined questions. Interviewees are asked open-ended questions in a systematic and consistent order (Berg, 2007; Fellow and Liu, 2003). The interviewer prepares some questions or a frame for the interview and is also free to probe when necessary. Naoum (2002) indicates that this approach is best used when the research problem to be investigated is at its preliminary stage.

To examine how leaders in UK construction organizations are promoting sustainable construction practices, in-depth semi- structured interviews were carried out with fifteen (15) leaders in sustainability roles from construction consulting organizations in UK. Formal letters were sent to such leaders as an invitation to participate in the study. These were then followed with telephone calls and a total of 15 leaders agreed to take part and the profile of the interviewees is presented in Table 1 below. The interviews lasted 30-40 minutes. It was also important to contact leaders from construction organizations currently pursuing sustainable construction practices.

Table 1: *Profile of fifteen UK Sustainability Leaders Interviewed*

Interviewee	Job Title	Type of organization
A	Sustainable Construction Manager	Consultant
B	Head of Sustainability	Consultant
C	Senior Sustainability Consultant	Consultant
D	Corporate Sustainability Manager	Consultant/contractor
E	Principal Sustainability Engineer	Consultant
F	Associate Head of sustainability	Consultant
G	Associate: Sustainability Manager	Consultant
H	Sustainability Consultant	Consultant
I	Senior Sustainability Manager	Contractor
J	Environmental Manager	Contractor
K	Head of Sustainable Development	Contractor
L	Sustainability Manager	Contractor
M	Director of Environment	Contractor
N	Principal sustainability Consultant	Contractor
O	Environmental Manager/Advisor	Contractor

Naoum, (2002) indicates that this approach is best used when the research problem to be investigated is at its preliminary stage. Questions asked during the interviews addressed issues such as: what drives construction organizations to pursue sustainable practices; the role of leader in promoting sustainable construction practices; factors affecting leaders in the effective implementation of sustainable practices in construction and leadership style of sustainability leaders.

4. Findings

This section presents a discussion of the findings extracted from the analysis of the interviews. With most of the companies interviewed, the focus on sustainability started with a clear desire to introduce sustainability on the part of the organizational leadership. Figure 1 provides a summary of each of the above issues considered in turn,

Drivers

Leaders were asked about what drives their organizations to pursue sustainable practices and the results were very interesting. Some of the drivers include: company reputation or brand image; win more contracts to remain in business; to attract and retain the right staff; position in the market place or competitive advantage; legislation or legal requirement and clients demand, For example interviewee ‘J’ responded by saying:

“There is a good business case to ensure we are sustainable. Our clients now insist we complete sustainability pre-qualification questionnaires. Also it generally saves us money. There is also the moral issue of making sure we do business the right way”

Furthermore, many of the interviewees pointed out that, having a green reputation will help their organisations to win more business in periods of economic recession, interviewee ‘B’ noted:

“What drives this company to pursue sustainability is for corporate identity or brand to remain in business especially in this current economic climate”

However, interviewee “K” reinforced the above by adding:

“What drives this company to pursue sustainability is to be a leader in the built environment, gain competitive advantage and be more efficient”

Role

Leaders have a role in helping to promote sustainable construction practices by providing training and awareness courses to staff on sustainability issues; driving forward the sustainability agenda; formulating policy, implementing procedure and disseminating best practice; work with clients on sustainability issues; sustainability monitoring and appraisal etc. Interviewee ‘F’ highlighted these roles by saying that:

“I am the main author of our sustainability guide and responsible for the integration of our strategy internally within the company and the strategy promotion externally. I also sit on our group sustainability committee which drives the strategy throughout the company”

In the words of interviewee “J” he described his role by saying that:

“As environmental manager I have a key role in driving the sustainability agenda within the organization. This includes formulating policy, implementing procedures, and disseminating best practice”

Several of the interviewees pointed out that the training of employees on sustainable issues was also a part of their roles. For instance interviewee ‘E’ said:

“I serve as catalyst in raising awareness on sustainability by training staff on sustainable construction practices”.

Challenges

When leaders were asked about factors affecting them in the effective implementation of sustainable construction practices in their organization the following issues were raised; the lack of full understanding of what sustainability truly means. Following the analysis of the collected qualitative data, the following factors were identified as other challenges; support from senior management; contract requirement; lack of client demand; large company size and diversity.

However interviewee “N” commented on the issue of understanding what sustainability really means by saying:

“An issue or a confusion on environmental and sustainability; some people focus on environmental instead of sustainability issues. There is still a misunderstanding of what sustainability really means”

Furthermore, interviewee ‘C’ added that:

“Managing competing and conflicting targets with other departments of the company to the understanding of a common sustainability goal is always difficult”

Senior management of company boards have other high priorities and sustainability is at the bottom of most company boards’ priority list. A sustainability consultant; Interviewee ‘H’ explained that:

“Top management or company board lack the awareness and knowledge to make decision on sustainability”

Style

A significant part of the study was to identify leadership style of sustainability leaders. Style of leadership was identified among the leaders interviewed as being; strategic, democratic, charismatic, transformational/ visionary and instrumental. Strategic leadership style was the most commonly identified style among the sustainability leaders. Most leaders described themselves as strategic and influential in the development of sustainability strategies. As interviewee ‘D’ observed:

“I am in a strategic role, active in the development of our sustainability strategy. I continue to influence the direction of the company in relation to sustainability and to help drive the ethos within the company through various mediums including engagement with stakeholders”

Finally, interviewee “A” described his style of leadership by pointing out that, he is:

“Transformational, focused on creating opportunities. I’m also strategic. All power of influence with very little power due to position of authority”

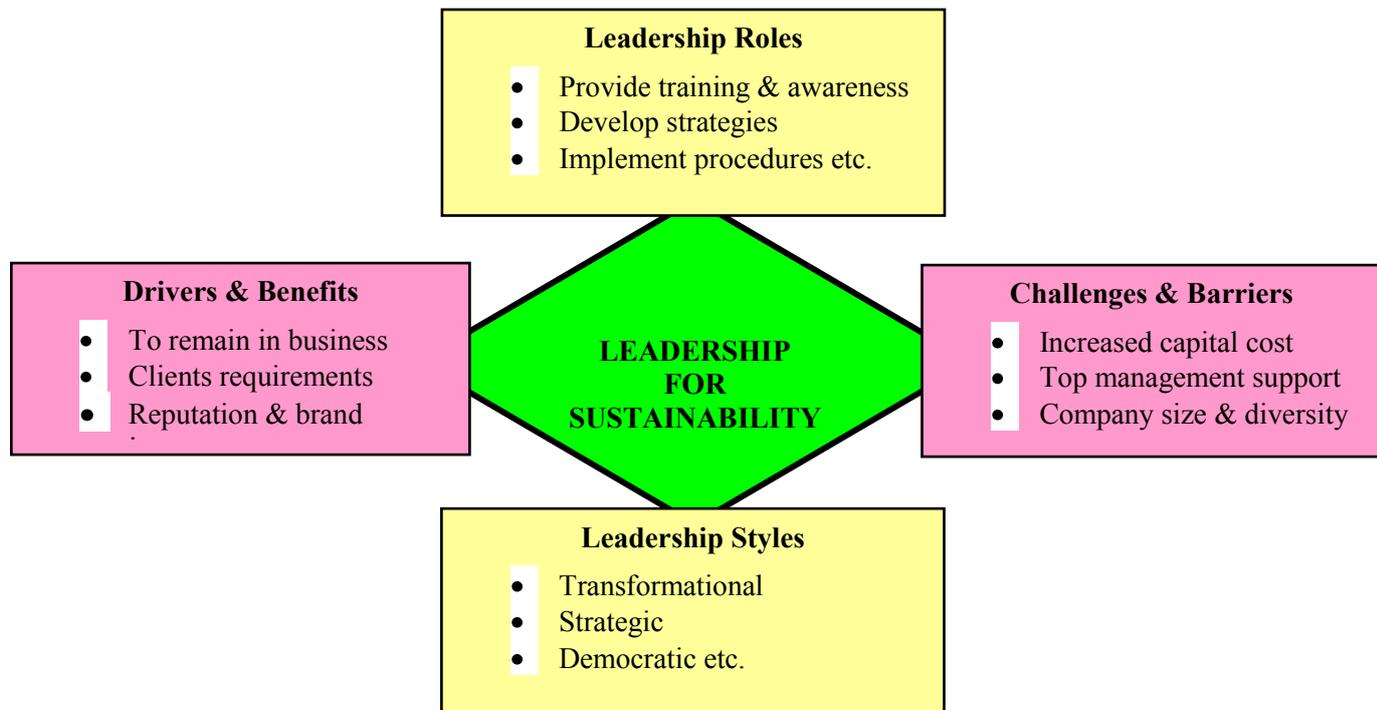


Fig.1 Summary of interview findings

5. Conclusions

The desire of construction organizations to pursue sustainability is driven by a number of factors including the need to win more contracts to remain in business. However, there are number of factors affecting the effective implementation of sustainable construction practices such real and perceived costs associated with sustainability. It was found that a strategic leadership style is the most commonly identified style among the sustainability leaders involved in the study. Most sustainability leaders interviewed described themselves as strategic and influential in the development of sustainability strategies.

The pursuit of sustainable construction practices is both a challenge and an opportunity. It is therefore important that organizational leaders turn such challenges into opportunities. Sustainable leaders have a role in helping to promote sustainable construction by training staff on sustainability as well as producing guidance notes and policies. This therefore establishes the need to further investigate the role of leadership in promoting sustainable construction in the on-going PhD research study.

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Barriers to HACCP Implementation: Evidence from Libya

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Abstract

There is widespread consensus that Hazard Analysis and Critical Control Point (HACCP) is an effective and economically efficient approach to food safety control. A number of studies have identified barriers to HACCP implementation in a variety of food businesses in a number of countries.

This study explores the barriers that obstruct the implementation of Hazard Analysis and Critical Control Point (HACCP) in the fisheries industry in Libya. The research methodology uses semi-structured interviews with top and middle management within the Marine sector in Libya.

This study identifies four unique barriers affecting the implementation of HACCP systems within the fisheries industry in Libya, namely a failure in law enforcement; deficient advance planning for the HACCP programmes; educational attainment not considered in the employees' appointment; and an imbalance between the working practices of the fish market and HACCP requirements.

This is an original approach to studying the barriers that obstruct the implementation of Hazard Analysis and Critical Control Point (HACCP) in the fisheries industry in Libya

This paper will support capacity building in the HACCP implementation system in Libya by identification of barriers that affect the implementation of this system within the fisheries industry, which is an important initial stage in any capacity building programme.

Keywords:

Food Safety, HACCP, Libya, Barriers.

1. Introduction

HACCP is the acronym of "Hazard Analysis and Critical Control Point" in English. It is an economical and effective administration system of controlling food safety.

Nearly 30 years ago, HACCP became internationally accepted (Codex, 2003). There is widespread consensus that Hazard Analysis and Critical Control Point (HACCP) is based on risk assessment and process control (FDA Food Code, 2005; Mortimore and Wallace, 1998; NACMCF, 1992; Worsfold & Griffith, 2003).

The classic HACCP system consists of seven principles which outline how to establish, implement and maintain a HACCP plan (figure 1).

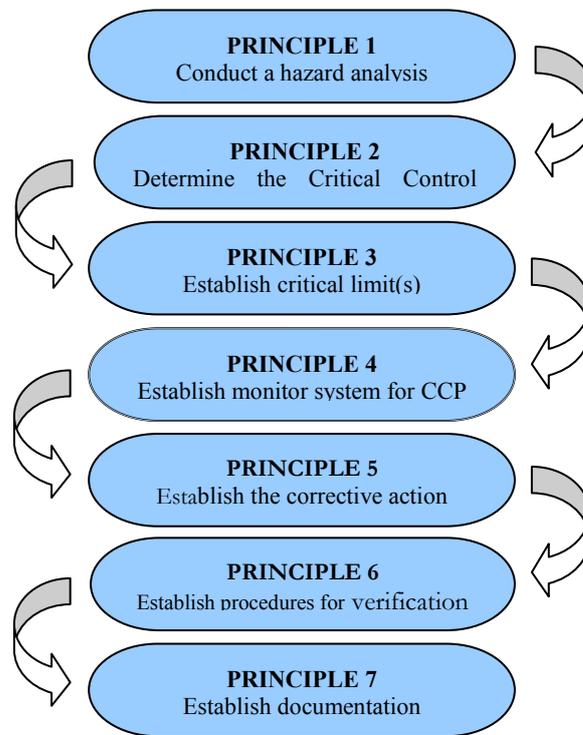


Fig. 1. The classic HACCP system

The successfully implemented, managed and maintained HACCP system depends on basic factors. These factors include commitment to food safety by all the management and leadership; availability of Pre-requisite programmes and external pressures such as performing and issuance of legislation and regulations (Panisello & Quantick, 2001). However, proper planning and the belief in the HACCP system by all personnel in the business add a successful factor to any effective implementation (Mortimore, 2001).

2. Literature Review

Despite wide endorsement of the benefits of HACCP, the literature suggests that successful implementation has been limited (Panisello & Quantick, 2001; Panisello et al., 1999; Taylor, 2001; Taylor and Taylor, 2004; Bas et al., 2007; Bas et al., 2006). In this respect, Panisello and Quantick (2001) believe that the reasons for non implementation of HACCP are more complicated than often recognized.

A number of studies have identified barriers to HACCP implementation in a variety of food business and different countries (Bas et al., 2007; Gilling, et al., 2001; Panisello and Quantick, 2001; Taylor and Kane, 2005; Panisello et al., 1999; Roberts and Sneed, 2003; Taylor and Taylor, 2004).

2.1. Barriers in Implementing HACCP

Barriers and difficulties of implementing HACCP are different from one culture to another (Mortimore, 2001). It is important for all organizations to understand the barriers before and during HACCP implementation so they can be properly handled to ensure a successfully introduced and sustained food safety system. However, there are a number of factors that have hindered the use of HACCP in many businesses (Fotopoulos et. al., 2009). These factors include: not have prerequisite programmes in place such as: written standard operating

procedures for cleaning and disinfection; lack of physical conditions equipment and facilities, as well as lack of personnel training; lack of knowledge about HACCP and food safety management systems. However, most of these factors are described as technical barriers and represent all those bad practices (Panisello & Quantick, 2001).

2.2. Technical Barriers in Implementing HACCP

Technical barriers either occur prior to implementation, through the process of implementation; or even after it have been implemented. For instance, in countries (like-wise Libya) where HACCP is not implemented the more important factors are those that happen prior to implementation, and the most common barrier in this stage is the delusion of control (Panisello and Quantick, 2001). Delusion of control is “the tendency for human beings to believe that they can control or at least influence outcomes which they clearly cannot.” (ibid, 168). In this respect Redmond and Griffith, (2004) in a study about consumer perceptions of food safety risk showed that consumers demonstrated judgment of an optimistic-bias and the illusion of control. Mortlock et al., (1999) showed, in an investigation of food hygiene practices and attitudes toward a range of food hygiene-related issues in food businesses that the majority of businesses’ managers thought that their business represented a low risk to food safety and were less expected to implement a food safety system such as HACCP than businesses supposed to be a high-risk. Whereas, another survey, by Panisello et al., (1999) of the level of HACCP implementation in the food industry, found that hazards are not perceived and therefore are not controlled or hazards are perceived, but the risks are not considered. It also demonstrated that hazard identification was far from complete in the majority of the food sectors. Slovic, (1987) suggested that acceptance of risk is influenced by factors such as familiarity associated with the activity (ibid). Thus, people tend to minimize the risks involved with familiar activities. Also, individuals believe that they have greater control over a potentially hazardous situation consequently they are at a reduced risk from the hazard than a comparable unfamiliar. The more people feel they know about a hazard, the more they feel they have control over it. In that case, people will be less motivated to adopt risk- reduction tools such as HACCP. People often make their risk evaluations based on what they believe to be true which may not necessarily be based on complete or correct information, even when they have access to an accurate source of knowledge (May & Burger, 1996). amongst the barriers to the implementation of HACCP are lack of HACCP awareness; lack of understanding of HACCP; lack of food safety knowledge; illusion of control; lack of pre-requisites programmes; lack of management commitment; lack of staff motivation; negative enforcement factors; lack of staff training; and not being a legal requirement.

3. Methodology

This study explores the barriers that obstruct the implementation of Hazard Analysis and Critical Control Point (HACCP) in the fisheries industry in Libya. It explores the barriers in implementing the HACCP system within the Bab Al Bahar fish market as a case study.

A Case study was decided as the best strategy for this study having considered the advice of Yin (2009) regarding the appropriateness of this strategy. In this research the case study strategy has been selected to gain the depth of understanding of the information necessary to explore the barriers that obstruct the implementation of the HACCP system implemented within the Bab Al Bahar fish market as a case study. This research will answer the research question of: What are the barriers that obstruct the implementation of the HACCP system within the Bab Al Bahar fish market.

The justifications for choosing this particular case (Bab Al Bahar) was because: it is a unique case; It is the only permanent Libyan public organization specialized in selling fish; It is allocated in the same place of Tripoli port (landing site); It is assumed by the Libyan government that this experience will be circulated to the rest of the Libyan ports; accessibility to the selected market will be easy for the author and permission was granted by the case study market for conducting this study.

The required data was collected to achieve the aim of the study through three sources; a review of the relevant literature on the concept and the aspects of HACCP barriers philosophy, documents reviewed and conduct semi-structured interviews to identify what, if any, barriers that obstruct the implementation of the HACCP system in the case study organization. This technique was chosen because of the necessity to understand the constructs that have been used by the interviewee as a basis for their views, beliefs and attitudes about the situation within which they found themselves, as well as to develop an understanding of each respondent's own point of view of these situations.

The semi-structured interviews were conducted with twenty employees; top management (TM) and middle management (MM) within the secretariat of Marine Wealth. The top management (TM) considered being Secretary General and consultants in the Scientific Committee for Marine Wealth; Directors of the Departments of: Fishing and the production, Quality Control, Training and Legal Affairs. The middle management (MM) considered being constructor and designer of the market, managers of Bab Al Bahar fish market, supervisor of the market, health inspector in the market, quality control manager, senior researchers in the Marine Biology Research Centre, experts in food science and chairman of Technical Committees of Libyan Standards for Processed and Non Processed Food.

The researcher started interviewing without knowing how many participants would be interviewed and continued until most answers had become repetitive, as well as the information was sufficient to achieve the research aim. They were interviewed on a one-to-one, face-to-face basis. In general, the average time for interviews was about one to one and a half hours. Interviews were conducted in the office of the respondent. Respondents were also asked to indicate their job title; how long they had worked in the marine sector; and their educational background.

It was determined to include these levels in order to gain in-depth information and clear perceptions about different aspects of barriers and obstructions in food safety practices. The use of documentary analysis enhances the findings of the interview and in doing so provides some of the advantages of case study research. However, the role of the documentary analysis although notably smaller is still of significance to the research objective and findings.

Documents that have been used was annual reports of the general Authority for Marine Wealth; reports issued by Marine Biology Research Centre; correspondence; contractual documents with fish suppliers; law no.14 which is concerning the technical requirements for marine production. As well as Law No. 106 regarding Public Health and food safety such as handling; manufacturing processes; preparation; marketing; storage and transportation of any food commodities.

Multiple sources of evidence were found to be useful as they helped to reduce uncertainty, in which case the author could consult documents to verify the answer provided and then compare this to other methods of data collection. The method of data analysis was based on the systematic analytical technique process.

4. Findings and Discussion

It is evident from the analysis of the semi-structured interviews and the review of the existing literature (Gilling et al., 2001; Panisello and Quantick, 2001; Taylor and Taylor, 2004; Vela and Fernandez, 2003; World Health Organization, 1999; Worsfold and Griffith, 2003; FAO/WHO, 2006) that there is extensive proof of the barriers that can make the implementation of HACCP difficult. One of the main barriers was a lack of awareness and understanding of food safety management and the related Prerequisite Programmes. Lacking a clear vision of what HACCP looks like is a major barrier to successful implementation (Taylor and Kane, 2005). However, the finding shows that the employees in the sector of Marine Wealth including the manager of the market significantly have a lower amount of food safety knowledge. Also it was found that there are important food safety practices that Bab albahar fish market has not implemented. Many of these practices represent prerequisite programmes that must be in place before HACCP can be implemented.

4.1. Prerequisite Programmes to HACCP

An effective HACCP plan cannot be implemented without prerequisite programmes (Panisello and Quantick, 2001). The study by Walker and Jones (2002) maintained that poor implementation of prerequisites for food safety caused foodborne disease infection in the food business and they suggested that the establishment of prerequisite programmes could provide a firm foundation to develop HACCP.

However, the important finding from this study was the status of prerequisite programmes. In general within the CSO, staffs have given the impression that the Prerequisites to HACCP are barely acknowledged. This creates a bad impact on the general food hygiene standards and adversely affects the fish-handling practices of workers. Moreover, the prerequisite programmes necessary for HACCP implementation have not been initiated in many operations, yet the majority of the prerequisite programmes are inexpensive and easy to implement. Accordingly, the importance of the prerequisites programmes to successful HACCP system implementation in Libyan fisheries industry is highlighted.

The finding suggest that assigning responsibility for food safety as one or two employee's major responsibility for fisheries safety is important, as this affects the food safety practices implemented in market. However, the availability of personnel specialized in food safety in general and in fisheries products in particular in the CSO was extremely limited. This finding can be compared to Celaya et al. (2007); in a study of the HACCP system implementation in small businesses of Madrid's community; where they indicated that the availability of personnel specialized in food issues was scarce in the companies investigated, though the influence of these specialized personnel was positive to any food safety system implementation.

According to Taylor, 2001 the employment of experienced and technically qualified personnel is a vital issue, because of their practical responsibilities for the implementation and maintenance of a HACCP system.

The same applies, in general food businesses, where Bas et al., (2007) determined the barriers for HACCP and food safety programmes implementation in Turkey. They concluded that the lack of knowledge of HACCP and other food safety programmes were the main barriers for food safety in food businesses. It is clear that food safety knowledge is an important starting point for subsequent food safety behaviour.

Subsequently, in Libya, educational attainment should be considered in the appointing process, as managers with a specialism in the area of food safety are more likely to understand and implement food safety practices (Henroid and Sneed, 2004).

4.2. Training

Training is one of the prerequisite programmes. It is an essential HACCP requirement. It is very important that employees are trained in their responsibilities. This must also include personnel on temporary assignment, individuals filling in during breaks, vacations or sick leave. However, the findings of this study indicated that all managerial staff; employees and basic fish handlers in the CSO have not received any basic food hygiene training. Thus, the apparent unawareness and non understanding of the basic of fish safety management was the inevitable result of not having the opportunity to train.

The practical application of such systems will be enhanced when an individual responsible for HACCP has successfully completed a course of training (Mungai, 2007).

The importance of training in food safety and HACCP has recently seen great interest and has become a necessity in the implementation of any food safety system such as HACCP (Engel, 1998). Food hygiene training should be a priority for both TM and MM in the Marine Wealth as indicated by the fact that operations with individuals who have food safety awareness used more appropriate food safety practices (Henroid and Sneed, 2004).

It is essential that managers in the CSO conduct some, if not all, of the training for the employees. However, one of the best ways to achieve effective training is by explaining to everyone in the CSO what is necessary to ensure the safety of the fisheries products, this will strengthen the process overall, allowing an effective focus on CCPs and their relationship to the safety of the product. On the other hand, training should be simplified and not delivered in a scientific language since when the training sounds too scientific or using difficult jargon, participants will not benefit especially if we take into consideration that most of the interviewees from TM and MM in the CSO lack awareness about food safety issues. Seaman and Eves, 2010 demonstrate that many managers do not have sufficient awareness or the proper attitude towards food hygiene training to facilitate an effective learning environment within the workplace.

According to Sneed et al., 2004, Training programmes, will support improvement of safe food-handling practices and implementation of prerequisite programmes and the HACCP programme. Accordingly, successful implementation of this system only works with training of the employees in the CSO.

Lack of staff training in food safety and HACCP system in the Bab Al Bahar fish market led to a clear negative impact on the prerequisite situation of Bab Al Bahar. Being deficient in any training programme is the main challenge that they face. Consequently, their perception of the hazards that may occur will be wrong, also it will lead to a misunderstanding of the basic health practices for handling fish in the market.

Training about HACCP and food hygiene is therefore recommended as being essential for all fish workers and inspection officers. Marine Wealth requires access to the training programmes for all employees in this market, each according to the field of specialization and job in the market. This suggests that the training for this market and the markets, which will be built later, and the recruiting of new staff to these new markets, should be based on receiving training on the basics of fish hygiene and handling of fisheries products in general, and in accordance to their speciality and position in the market.

4.3. Support for Food Safety Legislation

Analysis of the interviews exposed a particular concern within many different interviews, which is “the law enforcement”. These problems highlighted strong barriers to the implementation of HACCP and/or any HACCP-based system. At the same time the local authority should develop their tools and impose enforcement of the law, otherwise, it will be fruitless to apply any food safety system in the future.

4.4. Commitment of Leadership

Comparing the existing literature, it is evident that there is extensive proof of the barriers that can make the implementation of HACCP difficult. One of the main barriers being the lack of commitment to the HACCP system. The WHO has recognized that human resources are key elements in every organisation and that many barriers to HACCP implementation are associated to human forces (WHO, 1999).

Management commitment is essential for implementing and maintaining an effective HACCP system. Management commitment should extend until managers and workers get a proper training in basic food hygiene and HACCP to the point that employees can take their full responsibilities (WHO, 1999).

The interviewee’s opinions confirmed the advantages of management commitment to food safety system if it is implemented in the future. Even so, it was revealed from the section (4), the level of respondents’ awareness and understanding of food safety management and HACCP system was quite low. Subsequently this limited understanding leads to unawareness of the safety of fisheries products and to the lack of recognition of its benefits. This will affect their commitment in the future.

However, it was clear through interviews with the respondents in the CSO where it became apparent that there was a misunderstanding about commitment from the management. It was revealed from discussions that there is legislation covering all aspects of food safety and comparable to what is specified in the European Union legislation, but the reality is quite different, where the problem always lies in the application.

Though, if there is really any intention to commit to food safety (as they say in the interviews) the control of the time and temperature, conducting weekly preventive maintenance, and checks of fish contact surfaces would make a significant and immediate food safety commitment, and by followed these practices it can be considered that they have such a commitment.

Some respondent believe, that in Libya, what is really needed is planning then commitment. A lack of planning is the real problem. A lack of advance planning for any project makes implementation difficult. This seems logical, as for any project to succeed it needs good planning then commitment to it.

5. Conclusions and recommendation

This paper identified the barriers to the implementation of HACCP in fresh fish markets which contributes original knowledge to the field of HACCP related implementation-barriers to fresh fish markets and narrows the gap in this field.

The Libyan Government should clarify the goals of the strategy, and provide effective information and training to ensure effective application. The role of the government should be to provide leadership in the implementation of this strategy, with the aim to provide an infrastructure for its uniform application by industry, including appropriate regulations and

verifications of compliance, research, training, industry guidelines, coordination with industry among regulatory and advisory agencies and institutions. Government should accept the challenge of eliminating any constraints associated with implementation of this strategy.

Emphasis on implementing prerequisite programmes is needed in Bab Al Bahar fish market. Training programs, basic food safety such as GMP and, GHP will support the improvement of seafood handling practices and the implementation of the HACCP system. Also the level of education attainment should be considered in the hiring process.

The originality of this study is that it identified four unique barriers affecting the implementation of HACCP system within the fisheries industry in Libya, they are:

1. The failure in law enforcement;
2. Educational attainment not considered in the employees' appointment;
3. Imbalance between the working practices of the market and HACCP requirements;
4. Deficient advance planning for the HACCP programmes.

It seems that these barriers are highly affected by the culture and being a developing country. For instance the lack of law enforcement in Libya was related to the culture of Libyan people, where most interviewees think that this was due to the misunderstanding of the Islamic religion, according to the base of legitimacy "does no harm" and some assume that it was responding to the need for redistribution of wealth in Libya.

It is revealed from the above results that there was no effective planning. Every project requires clear objectives and measures planning, then implementation. Planning for a programme to accomplish the aim, suitable for the local environment, then it can be applied.

Also it was found that educational attainment was not considered in the appointing process, as this will affect managers if they are not specialised in the area of food safety in terms of being more likely to understand and implement any food safety practices (Henroid and Sneed, 2004).

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An Exploration of the Knowledge and Beliefs of Care Home Staff Related to Stroke Rehabilitation

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Abstract

This study explores the knowledge and beliefs of care home staff regarding rehabilitation for residents with stroke. The national drive to decrease length of hospital stay post-stroke has resulted in 11% of patients being discharged directly to care homes. The management of stroke has been transformed in recent years but there is less evidence on stroke rehabilitation for care home residents.

Care home staff are responsible for recognising residents' rehabilitation needs but are likely to have limited knowledge about stroke rehabilitation. Their beliefs about supporting rehabilitation are unknown.

The aim of the study was to understand the knowledge and beliefs of care home staff about stroke rehabilitation. The study used a qualitative approach to explore the knowledge and beliefs of a purposive sample of staff from care homes in Salford. Data was collected through questionnaires and semi-structured interviews and interpreted through content analysis.

The results indicate variable knowledge regarding stroke with some symptoms being poorly understood. Staff agreed that rehabilitation should take place within care homes and indicated support in enabling this process. However, limited time and poor communication with rehabilitation specialists were seen as barriers to supporting rehabilitation. The findings suggest that stroke rehabilitation for patients in care homes could be enhanced by: better communication and greater commitment from rehabilitation specialists; improved awareness of stroke and rehabilitation for care home staff; and, increased commitment from care home staff to support stroke rehabilitation.

Keywords

Beliefs; Care homes; Knowledge; Stroke; Rehabilitation

1. Introduction

Stroke care has been transformed in recent years (Intercollegiate Stroke Working Party, 2008) but access to rehabilitation for care home residents with stroke is less well-developed. Clinical guidelines recommend that care home residents should be able to access assessment and treatment from specialist rehabilitation staff (Intercollegiate Stroke Working Party, 2008). National initiatives aimed at decreasing length of hospital stay have resulted in 11% of stroke patients being discharged directly to care homes with 2% discharged to residential care within two weeks of admission to hospital (Intercollegiate Stroke Working Party, 2009). This trend places responsibility on care home staff to ensure that residents with stroke are able to access rehabilitation services and to support delivery of rehabilitation programmes. There is limited evidence on the ability of care home staff to fulfill this responsibility and it is unclear how staff perceive their role in supporting rehabilitation.

2. Background

2.1 Stroke rehabilitation

Management of stroke before the 1950s was very different to current approaches with low expectation of recovery. The development of CT scanning in the 1970s improved diagnosis enabling clinicians to identify the underlying pathology of stroke (Brahme, 1978). Research enabled clinicians to offer a prognosis based on the area of the brain affected (Bamford, et al., 1991) and thrombolytic drugs are increasingly used to reduce the impact of stroke (Hachinski, 1996; Hacke, et al., 1995). In the 1990s evidence was provided that caring for people in dedicated stroke units improved outcomes (Kalra, et al., 1995).

Stroke rehabilitation developed in the last century with a number of neuro-developmental treatment concepts emerging to promote physical recovery (Hafsteinsdóttir, 1996). Access to rehabilitation in hospital has improved, supported by a range of national policies with some care homes offering rehabilitation through intermediate care services (HSC 2001/01 : LAC (2001) 1). However, the provision of rehabilitation services generally within care homes is poor with variation in the level of access to different therapies (Barodawala, et al., 2001; de Boer, et al., 2007; Jacobs, et al., 2001; Leemrijse, et al., 2007; Proot, et al., 2002; Sackley, et al., 2009a). Care home staff provide an influential role in selecting patients for rehabilitation based on their knowledge of stroke and rehabilitation (Arling, et al., 2000; Kochersberger, et al., 1994; Murray, et al., 2005; Sackley, et al., 2009b; Vahakangas, et al., 2006). However, where knowledge is limited, selection may be inappropriate (Sackley, et al., 2004; Vahakangas, et al., 2006) and the evidence regarding factors which might affect a person's response to rehabilitation such as age, disability, cognition and mood is conflicting (Arling, et al., 2000; Berg, et al., 1997; Donkervoot, et al., 2006; Moseley, 1995; van Heugten, et al., 2000).

Rehabilitation is primarily considered as a means to promote recovery but is also important in preventing deterioration (Bowman, et al., 2000). The range of rehabilitation interventions provided in care homes varies but treatment can be successfully delivered in this environment (Brittle, et al., 2009; Donkervoot, et al., 2006; Langhammer, et al., 2007; Lin, et al., 2003; Sackley, et al., 2004; Sackley, et al., 2006; Tseng, et al., 2007; van Heugten, et al., 1998; van Heugten, et al., 2000). The benefits of providing rehabilitation for care home residents are potential discharge home (Murray, et al., 2003; Salgado, et al., 1995), decrease in mortality (Murray, et al., 2003) and greater independence (Leeds, et al., 2004; Moseley, 1996; Murray, et al., 2005; Przbylski, et al., 1996).

Medical staff have focused on the condition as the role for the profession increased. Thus the development of services can be considered as a social construct (Berger, et al., 1966) as medical advancements influenced the collective thinking about stroke. Similarly, the expectations of people experiencing stroke have changed (Wiles, et al., 2004) along with societal perceptions about the services that should be available to patients.

2.2 Knowledge and beliefs

Training regarding stroke and rehabilitation are not mandatory within pre or post-registration nursing education or National Vocational Qualifications (NVQ) for healthcare assistants (HCAs). Staff working in care homes have limited knowledge about some of the specific issues regarding stroke (Kumlien, et al., 2000, 2002) and acknowledge the need for more specific stroke training (Smith, et al., 2008). Despite the benefits for residents (Bryan, et al., 1996; Davies, et al., 1999; Frenkel, et al., 2001) access to training for care home staff is limited (Davies, et al., 1999; Parks, et al., 2005). Low staffing levels and the physical demands on staff make the experience of working in care homes unappealing (Bowling, et al., 1991). Low staffing levels can lead to sub-optimal care (Isola, et al., 2008) and make it

difficult for staff to support rehabilitation programmes (Levin, et al., 2008). Familiarity with disability also has a negative influence on staff making it less likely that rehabilitation is offered (Gething, et al., 1994).

There is limited evidence regarding the knowledge of care home staff regarding stroke which would enable them to decide when to access rehabilitation services for residents. Likewise there is limited understanding of the beliefs of staff regarding their role in supporting the rehabilitation process.

2.1 Aim

The aim of the study was to gain an understanding of the knowledge and beliefs of staff working in care homes about rehabilitation for people with stroke.

2.2 Research questions

The research questions were designed to clarify:

1. If staff working in care homes have knowledge of current evidence for best practice regarding the long-term management of residents with stroke in relation to rehabilitation;
2. If staff have the knowledge to recognise the need for further rehabilitation amongst residents;
3. The beliefs of staff about rehabilitation.

2.3 Methods and design

A qualitative, exploratory study design was selected as little is known about stroke rehabilitation supported by care home staff. The methodological approach was based on social constructionism. Social constructionism is concerned with explaining the processes by which people describe and account for their world experiences (Gergen, 1985). Interviews with staff were carried out in care homes to gain information on their knowledge of stroke rehabilitation and beliefs about their roles in this process.

2.4 Sample

A purposeful sample was obtained following a search of the Care Quality Commission (CQC) website. The sample was drawn from all i.e. 18 registered care homes offering nursing care in the local authority area of Salford. The search identified an uneven geographical spread of care homes with nursing within the locality. Quality ratings awarded by CQC varied from 'good' to 'poor'. One home was excluded from the sampling process as it was under review by the CQC at the time of selection. Nine were selected from the remaining 17 to include a variety of quality ratings and a geographical spread across the city. Selection was supported by discussion with colleagues from the local NHS Funded Care Team.

Care home managers were contacted to provide information by telephone and in writing to explain the purpose of the study. Managers were asked to nominate registered nurses and HCAs to take part in the study. Two homes were subsequently excluded from the sample as owners did not consent to inclusion. This reduced the sample to seven care homes from which only one manager provided a list of potential participants who were sent individual letters and information. Managers from the other six homes asked that the participant letter

and information be sent by email for them to share with potential participants. A minimum of two-weeks was allowed at each point of contact to allow participants time for consideration.

2.5 Ethical issues

Ethical approval was granted by the University of Salford Ethics Committee. The proposal was also submitted to a Local Research Ethics Committee (LREC) which clarified that the study did not need approval by an NHS ethics committee since it did not involve NHS patients, staff or premises. The study was also registered with the Research Governance Committee for NHS Salford.

Prior to the interview participants were given information on the background for the research. Participants provided written consent to take part in the study and have the interview taped to ensure accurate transcription. The main ethical issue concerned access to individual participants through their managers, which may have put pressure on participants to take part in the study.

2.6 Data collection

Participants were asked to complete a short questionnaire identifying demographic data and previous training opportunities at the start of the interview process. For the interview open-ended questions were used based on a guide to ensure that all aspects of the research questions were explored.

The rationale underpinning the questions was to:

- Determine participants' awareness of national guidelines for best practice in the long-term management of people with stroke;
- Gain an understanding of the knowledge regarding the problems associated with stroke including factors, which might indicate the need for rehabilitation;
- Identify current practice within the home regarding stroke rehabilitation; and
- Gain an understanding of the beliefs of staff regarding rehabilitation.

A short vignette was used to prompt discussion highlighting the problems that might occur with the long-term management of stroke. During the interviews comments were reflected back to participants to facilitate understanding of responses. Data and field notes taken during the interviews were transcribed within one week of the interviews taking place. In total 32 members of staff (nurses = 17; HCAs = 15) from seven care homes were interviewed. The results indicate that saturation of data collection was achieved by interview 13 with nurses and interview 12 with HCAs. Subsequent interviews were used to validate the developing theories.

2.7 Data analysis

Taped discussions were transcribed using a modified protocol (Flick, 2006) to identify overlapping conversations, stressed words, pauses in speech patterns etc. within the text. Transcripts were checked against the audio-recordings and corrected as required to ensure accuracy. Direct content analysis was used (Elo, et al., 2008; Hsieh, et al., 2005; Pope, et al., 2000) to condense the data into meaningful categories (Elo, et al., 2008) with some themes identified prior to analysis based on a priori knowledge (deductive) whilst others emerged through analysis of the data (inductive). Examples of the categorization process adapted from Graneheim (2004) are displayed in Table 1 below.

Table 1: Example of categorisation process

Meaning unit	Condensed meaning unit	Interpretation of underlying meaning	Sub theme	Theme
“We have student nurses, we’re accredited to have student nurses, I mentor them usually” (N2, 10-12)	The home is accredited to take student nurses and I provide mentorship	The home offers clinical placements to nursing students.	The home provides learning opportunities	Education
We monitor the blood pressure and all on a regular basis. We control their diet. Do you know, some of them might be having hypertension, you know so we check the blood and review the medication with the GPs, we ask them, you know according to the hypertension. (18C, 97-100)	We carry out regular assessment of the patients’ vital signs on blood pressure and diet and the GP reviews medication	Residents receive care for secondary prevention	Secondary prevention	Stroke knowledge

3. Findings

3.1 Data from questionnaires

All the registered nurses were female with 59% of nurses and 53% of HCAs aged between 31- 50 years. Eighty percent of the HCAs had been trained to NVQ level 2 or 3 with one participant undertaking training to become an NVQ assessor within the home.

Of the registered nurses, 76% had worked within the care home setting for 2 years or more. Whilst 52% of nurses had worked within the care home setting for more than 5 years, only 30% had been employed in their current position within the same period indicating workforce movement between homes. Seventy percent of nurses spent more than 20% of their time with stroke patients. Despite limited access to formal training, 82% of nurses and 73% of HCAs reported having more than two years practical experience of working with stroke patients. However, only four nurses and one HCA reported receiving specific stroke training.

The data collated from the questionnaires indicate that participants in this study are similar to participants from two larger studies carried out in care homes in different parts of the UK (Nazarko, 2007; Smith, et al., 2008).

Data from the interviews are summarized below.

3.2 Policies and guidelines

Participants generally were unaware of national policies and guidelines regarding the long-term management of stroke with one comment that their knowledge would be “*no more than the general public*”.

The lack of awareness amongst HCAs had been anticipated given that this staff group is not responsible for integrating guidelines into practice. The limited awareness demonstrated by nurses is of concern given the evidence that knowledge of guidelines can improve the care provided in residential facilities (Berlowitz, et al., 2001). Even where nurses indicated some knowledge of policies and guidelines, this information had not been integrated into clinical practice.

These findings suggest that national directives to improve the long-term care and support offered to people with stroke living in care homes are not being integrated into practice.

3.3 Knowledge of stroke

Physical impairments were broadly understood by all participants with immobility most commonly associated with stroke. Problems associated with cognitive and visual impairments were less well understood. Participants recognised that physical impairments frequently led to dependence and identified their role in promoting independence acknowledging that decreased independence adversely affected mental well-being and social inclusion:

“You try to work with people’s disabilities but in saying that, you also try to give as much independence”.

Limited mobility resulted in many residents needing equipment to aid transfers and assist with positioning in bed. Residents with very limited mobility spent more time in bed necessitating frequent re-positioning to prevent pressure sores and aspiration.

“They tend to sort of slide down, they never seem to be sat upright... we understand they’ve got to be kept upright because they can aspirate”.

Spasticity was acknowledged as a problem with the potential to lead to the development of contractures. Participants appeared to have some awareness of the problems which could develop as a result of contractures and potential use of splints to minimise their development. Pain was identified by a few participants mainly associated with immobility with referral to the GP suggested as the most likely course of action:

“Sometimes if the pain is really severe we refer them to the GP. The GP comes and sees them like, gives painkillers”

Although neuropathic pain occurs in 8% of people with stroke (Andersen, et al., 1995) post-stroke pain was not mentioned by any participants indicating that residents with this problem may not receive effective treatment.

3.4 Education and training

There was limited use of care homes for educational placements, particularly pre-registration nurse training, despite the potential benefits described in the literature (Davies, et al., 2000; Hicks, 2001). Responses suggest that students with healthcare experience are of greater benefit to staff and residents as these students had already developed interpersonal skills

which enabled them to “*communicate well with the patient*” thereby increasing opportunities for socialisation.

Access to training for HCAs was mainly through NVQ programmes. Access to training for nurses was limited despite evidence to support the need for ongoing training (Nazarko, 2007; Yeh, et al., 2002) and evidence that staff would like more training (Smith, et al., 2008). There was support for stroke specific training with participants identifying positioning and moving and handling as key areas to be addressed: “*I’d like to be taught the correct way of positioning people that have had strokes*”. A local training programme (Fawcett, 2010) had been well received and was accepted as a positive step in promoting awareness and improving care.

3.5 Rehabilitation

Referring residents for further therapy was influenced by the perception that people admitted to care homes following stroke have limited potential for improvement. Access to therapists was mainly through GPs and therefore dependent on the knowledge of the staff and the GP regarding rehabilitation. Direct referral by staff to specialists may improve access for residents to further rehabilitation.

Interventions provided by therapists were mainly associated with support for nutritional status from speech and language therapists (SALT) and dieticians: “*SALT will come out if anything with the diet changes but we don’t normally get physios coming out*”. Although physiotherapy was commonly associated with rehabilitation there was evidence of limited access to the service within care homes. Participants identified that therapists provided written information within care plans but did not routinely provide practical handover of rehabilitation interventions:

“They will just come to show one staff and then this staff...will be the staff who will be passing it over to staff, but sometimes you know sometimes there will be a communication gap...”

Handover might be communicated more effectively via practical demonstrations with increased opportunities to engage staff in the rehabilitation process.

3.6 Beliefs about rehabilitation

Participants were generally supportive of rehabilitation indicating a belief that residents should be given every opportunity to explore their potential for recovery: “*I just think that they should be given the chance to have a few sessions at least*”. There was also a belief that residents should not be discharged from rehabilitation services if there was any potential for further improvement. However participants were unaware of the factors which might have influenced decisions made by rehabilitation teams that further intervention would be of little benefit. This may be due to limited knowledge of prognostic indicators and insufficient information provided by hospital staff to care homes. The evidence of earlier discharge from hospital before residents have reached their optimal potential (Intercollegiate Stroke Working Party, 2009) indicates the need to provide care home staff with more comprehensive information.

Participants reported working in partnership with visiting therapists: “*I think it would be like a partnership. I mean they’d do their bit and we’ve got to do ours*”. This is in contrast to recent findings that therapy staff find it difficult to access care homes and engage staff in training to support care (Neurological Commissioning Support, 2010). Time constraints posed a major barrier to supporting rehabilitation and there were some concerns about the associated risks and accountability.

4. Discussion

4.1 Policies and guidelines

The limited knowledge of nurses within this care sector regarding national policies and guidelines for stroke raises concerns with the current political emphasis on expanding healthcare provision to a range of NHS and independent providers. Maintaining quality and equity of services will require explicit governance arrangements to provide assurance to commissioning bodies that the needs of residents can be met.

The current political and economic drivers within healthcare indicate that changes in service provision, including rehabilitation, must be made. The increasing number of people with long-term conditions including stroke make it impossible to fund specialist care within the NHS and the political direction is supportive of including the independent and voluntary sectors into pathways of care. This potential fragmentation of healthcare commissioned from any willing qualified provider (Department of Health, 2011) increases the need for integration of care pathways throughout the whole patient journey and is dependent on cohesive commissioning of integrated services.

4.2 Knowledge of stroke

The range of healthcare problems experienced by residents may negate the development of in-depth knowledge regarding specific conditions favoring the acquisition of generic skills (Department of Health, 2003). However residents in care homes should be managed appropriately to meet their needs (Care Quality Commission, 2010) and it is unclear how this might be achieved without greater knowledge of specific conditions. This is particularly relevant with the high incidence of stroke within the care home population which would indicate that this is an area where greater knowledge would be advantageous to residents and staff.

4.3 Education and training

Access to training for all care home staff is more pressing given the reports that people are being admitted to residential care with increasingly complex problems with “a trend of discharging ‘sicker and quicker’ from the acute sector to long-term care” (Bowman, et al., 2000, p. 77). Structured educational development of nurses and HCAs working in care homes would provide a framework for career progression within this sector of care (Eyers, et al., 2006). Investment in education and training would add value to the role of care home staff and ensure residents receive appropriate care (Fitzpatrick, et al., 2004).

4.4 Rehabilitation

Findings indicating limited access to rehabilitation for residents suggest that people discharged to care homes are not perceived to have potential for further recovery ignoring the role of rehabilitation in preventing deterioration. Absence or slow recovery of specific aspects of function such as sitting balance and continence, indicate poor prognosis for recovery following stroke (Nichols, et al., 1996). However, early decisions regarding prognosis may disadvantage people who are progressing at a slow rate (Demain, et al., 2006, p. 816). Patients may be denied rehabilitation based on the concept that they lack motivation but labeling patients in this way in the early days following stroke leads to marginalization within the stroke rehabilitation setting and adversely influences the treatment they receive (Maclean, et al., 2002) which may in turn lead to early discharge to residential care.

Staff within care homes also make judgements about which people might benefit from rehabilitation although their ability to make such decisions may be flawed (Sackley, et al.,

2009b). A deeper understanding of rehabilitation would support care home staff to identify residents for rehabilitation appropriately to ensure that all opportunities are explored.

Findings from this study indicate that rehabilitation staff do not offer ongoing treatment to care home residents. This contrasts with evidence that community teams experience difficulty in accessing care homes finding care home staff reluctant to engage with long-term management plans (Neurological Commissioning Support, 2010). The values and beliefs of therapists and the availability of services are all factors which influence decisions about the benefits of rehabilitation and the potential need for ongoing intervention (Demain, et al., 2006). There is evidence that the relationship between NHS staff and care home staff is based on an unequal power dynamic with NHS staff feeling “more powerful (and) more professional” than staff working in care homes (Owen, et al., 2008). Partnership working could be improved by increasing opportunities for rehabilitation staff to go into care homes to provide advice and education to staff (Owen, et al., 2008).

4.5 Disability and ageism

Nurses may hold negative beliefs about disability because they are regularly confronted by the effects of ill-health (Gething, et al., 1994). It is possible that if staff believe that people with stroke are discharged to care homes because there is no further potential for rehabilitation they may be unenthusiastic about supporting further treatment. There may also be a belief that where stroke is severely disabling, death might be preferable to living (Gilmet, et al., 2003).

People who are perceived as being unable to contribute to society are labeled as being dependent particularly where there is an inability to carry out essential tasks related to personal care, mental stability and communication and older people are over-represented in this classification (Johnson, 1993). The social construct of ageing influences how older people are perceived and within the western culture, the aging process is generally feared (Phelan, 2010). Prevalent negative attitudes within society towards older age are reflected in the views of nurses and consolidated within nurse training (Stevens, et al., 1995). The findings from this study suggest that poor access to services was influenced by ageism.

4.6 Limitations

The scope of this study was bounded by the time and resources available. It was carried out in care homes in northern England and the results should be viewed in this context acknowledging that for qualitative research context is crucial (Wheatley, 1999).

5 Conclusion

Findings from this study support previous evidence that care home staff have limited knowledge of current evidence for the long-term management of stroke. National policies are not visible to care home staff who do not fully engage in the aspects of care for which they might be expected to have responsibility.

This study offers new evidence that care home staff believe that residents with stroke should have equitable access to rehabilitation in line with people living at home. They believe that they have a role in supporting rehabilitation, but this is obstructed by:

- Their limited knowledge of stroke and rehabilitation;
- The lack of integration with NHS services and staff;

- Limited time to devote to the rehabilitation needs of residents.

There are challenges for the emerging clinical consortia to ensure that services are commissioned for people with stroke which encompass the whole care pathway including people living in care homes (Care Quality Commission, 2011).

Further research is required to identify the perceptions of therapy staff regarding rehabilitation for this client group.

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