

**AN EMPIRICAL ANALYSIS OF THE STRATEGIC MANAGEMENT OF
COMPETITIVE ADVANTAGE: A CASE STUDY OF HIGHER TECHNICAL
AND VOCATIONAL EDUCATION IN TAIWAN**

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ABSTRACT

Institutions of higher technical and vocational education (hereafter HTVE) in Taiwan face the pressures of a reduced number of students and competition for students from an increased number of domestic and international institutions. To cope with these challenges, HTVE institutions that are better equipped to respond to market requirements, and are prepared to make constant improvements in the efficiency and performance of their academic and administrative affairs, are expected to attain a competitive advantage and enhance their long-term sustainability.

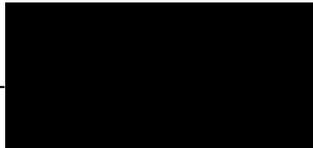
In this research, a model of competitive advantage for HTVE institutions in Taiwan is developed and tested. The model integrates theories of strategy and competitive advantage, namely industrial organization theory, resource-based view theory, and Miles and Snow's (1978) typology of strategy. Within this framework, research was conducted to: (i) identify the elements and indicators of competitive advantage as they apply specifically to HTVE institutions; (ii) analyze the types of strategies undertaken by HTVE institutions to best fit with their internal and external environments; (iii) ascertain the major factors of external industry structure, internal resources, and institutional performance; and (iv) examine the relationships between external industry structure, internal resources, and strategy types with institutional performance in the context of Taiwan's HTVE.

As a result of this research, it is concluded that integration of the resource-based view theory and Miles and Snow's (1978) typology of strategy provides a useful framework in which to comprehensively and systematically analyze an industry sector in relation to competitive advantage. This study highlights that an effective competitive strategy for HTVE institutions in Taiwan depends on the match between the state of the environment surrounding the HTVE institutions and their use of resources. The results have implications for government policy-makers attempting to oversee the quality of HTVE in Taiwan, and for senior managers of HTVE institutions aiming to achieve competitive advantage and sustainability. A series of actions can be taken, including establishing market-exit mechanisms, advocating strategic alliances and partnerships between institutions, co-operating with foreign institutions of higher education, advocating industry-academia collaborations, and ensuring curriculum design in compliance with industry requirements.

STUDENT DECLARATION

I, Hsun-I Huang, declare that the PhD thesis entitled An Empirical Analysis of The Strategic Management of Competitive Advantage: a Case Study of Higher Technical and Vocational Education in Taiwan is no more than 100,000 words in length, exclusive of tables, figures, appendices, references and footnotes. This thesis contains no material that has been published by another person previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

Signed-



17st February 2012

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CHAPTER 1: INTRODUCTION

1.1 Introduction

This chapter outlines the background information needed to develop a competitive advantage model for institutions of higher technical and vocational education (HTVE) in Taiwan. Subsequently, the research objectives are identified, as are the expected outcomes and the benefits of the research. In the final section, the research process is formulated and the thesis structure is described.

1.2 Research background

Technical and vocational education plays an important role in cultivating a nation's skilled labour. It can improve the quality of the skilled labour, and effectively respond to the demand of labour so as to meet the needs of rapid economic development (Yuen, 1993). In recognition of the importance of technical and vocational education for the economy of a country, many countries in the Asia-Pacific region have placed increasing emphasis on technical and vocational education. This has depended on historical, social, economic and political considerations (Tilak, 2002). Taiwan, as a country in the Asia-Pacific region, has placed a high priority on technical and vocational education for a long time, particularly at an early stage of the industrialisation process. The "Taiwan Economic Miracle" has owed much to its system of vocational and technical education as it has produced a highly motivated and well-trained labour workforce (Yuen, 1993).

The technical and vocational education system in Taiwan has traditionally nurtured a variety of workforce preparation levels that have contributed to a solid economic foundation. However, since the 1990s, Taiwan has been confronted with both internal and external challenges. Internally, Taiwan needs a more effective education and training system to develop and maintain higher quality human resources (Lee, 1996). This workforce demand is based on the nation's economic structure, which has gradually shifted from manufacturing to information technology and biotechnology. Externally, Taiwan needs to maintain and promote its competitiveness in the global economy (Lee, 1996). Faced with these challenges, it has been important for Taiwan's technical and vocational education sector, particularly higher level technical and vocational education, to make structural adjustments that are aligned with the needs of a developing society and to respond to future worldwide trends and changes (Yu & Hsu,

2003). The term 'higher technical and vocational education' (HTVE) is used in this study to refer to the advanced level of

“the educational process involving, in addition to general knowledge, the study of technologies and related sciences and the acquisition of practical skills, know-how, attitudes and understanding relating to occupations in various sectors of economic and social life” (United Nation Educational, Scientific and Cultural Organization, 1989, p.232).

Taiwan's HTVE sector has, however, experienced unbalanced supply and demand. While there has been a sharp increase in the total number of HTVE institutions, the pool of potential students has reduced due to a declining birth rate. Meanwhile, it is expected that the impact of entry into the World Trade Organisation (hereafter WTO) on Taiwan's HTVE sector will lead to an exodus of a proportion of the student population (Huang, 2003; Chang, Chen & Huang, 2005). Foreign institutions are now allowed to 'export' their services and attract local students to study abroad (Huang, 2003; Chang et al., 2005).

These factors intensify the problems associated with excessive oversupply of the HTVE product. Within this context, HTVE institutions in Taiwan need strategies that best match their internal resources with the external competitive environment in order to survive. Therefore, there is an urgent need to examine the factors critical to the establishment and maintenance of competitive advantage for HTVE institutions and to develop and explore a model of competitive advantage. Such a model will serve as a guiding framework for HTVE institutions to achieve superior performance and long-term sustainability.

1.3 Research aim

This study aims to develop a framework to assist and guide HTVE institutions in Taiwan to achieve and sustain their competitive advantage. The development of a model of competitive advantage for HTVE institutions in Taiwan is considered necessary for several reasons. Firstly, the concepts and models of strategic planning for higher education have already been raised (see, for example, Kotler & Murphy, 1981; Grunder, 1991; Bell, 2002; Richards, O'Shea & Connolly, 2004; Mashhadi, Mohajeri & Nayeri,

2008). However, little research has been undertaken to apply theories of competitive advantage to the context of higher education, and HTVE in particular. By exploring the elements and indicators of competitive advantage for HTVE institutions, this study will provide a foundation for future research in this area. Secondly, the model proposed for this study is based primarily on the industrial organization and resource-based view theories of competitive advantage and encompasses the range of factors critical to the development of competitive advantage for HTVE institutions. However, the relationships between external industry structure, internal resources, strategy types, and institutional performance have not been clearly identified. This study, focusing on the HTVE institutions in Taiwan as a unit analysis, is intended to ascertain the relative importance of external industry structure and internal resources on strategy types, which in turn can contribute to institutional performance.

Lastly, the development of a model of competitive advantage offers the prospect of assisting HTVE institutions in Taiwan to identify their relative strengths and weaknesses with respect to resources and capabilities, to highlight opportunities for institutional development, and to develop strategies to combat potential threats. Correspondingly, through developing and exploring the proposed model of competitive advantage in the context of Taiwan's HTVE sector, this study attempts to provide higher educational authorities (e.g. government policy-makers) and senior managers of HTVE institutions (e.g. board of directors, major administrators and faculty representatives) with useful insights into their competitive positions in the market.

1.3.1 General aim

The overall purpose of this study is to develop a model of competitive advantage for HTVE institutions in Taiwan. Such a model is needed by Taiwan's HTVE sector to assist institutions in identifying competitive advantage, determined either by industry characteristics or created by the institution itself through the accumulation of both tangible and intangible resources. A model will also help determine the impact of various strategies on institutional performance.

1.3.2 Specific aims

Within this broader purpose, the study focuses on four specific aims, as follows:

- i. To identify the elements and indicators of competitive advantage as they apply specifically to HTVE institutions;
- ii. To analyze the types of strategy adopted by HTVE institutions that best fit with their internal and external environments;
- iii. To ascertain the major factors of external industry structure, internal resources, and institutional performance; and
- iv. To examine the relationships between external industry structure, internal resources, and strategy types with institutional performance.

1.4 Overview of the conceptual framework

The conceptual framework used for this research draws upon theoretical concepts and historical contexts of strategy and competitive advantage. The conceptual framework is used to link the relationships between external industry structure, internal resources, and strategy types with institutional performance. Industrial organization and resource-based view theories have been used extensively to analyze the factors of competitive advantage that allow a firm to achieve superior performance. In addition, the well-known typology of Miles and Snow's (1978) strategy is reviewed and applied in this study. This typology has been used in many studies related to strategic management and has been helpful in enriching the understanding of strategy in a number of industries.

1.5 Overview of the research method

A two-stage approach to the research was adopted. First, the research involved a series of in-depth interviews with a convenience sample of 32 senior managers who already have leadership and management experience and currently hold top management positions in Taiwan's HTVE institutions. The information gained from this stage of the research was used to inform the development of a questionnaire designed to elicit information from a cross-section of senior managers in Taiwan's HTVE institutions. The subsequent survey sought to explore issues raised in the conceptual framework and to gather quantitative data to complement the qualitative data.

1.6 Contributions of the research

Education is a regulated sector and is subject to government regulations, historical influences and geographic constraints that do not necessarily apply to other goods and services. Thus, creating and achieving competitive advantage in the educational sector is not the same as it would be in straightforward commerce. Given the specific nature of the educational sector, the application of strategic management concepts to educational institutions poses challenges at conceptual and practical levels. This study has highlighted these challenges and in this way has made a scholarly contribution to knowledge in the field of education.

This study also makes a contribution to theoretical understanding of the competitive advantage of educational institutions in Taiwan. A model of competitive advantage is developed and tested. As indicated, the model integrates theories of competitive advantage and conceptualizes the relationships between external industry structure, internal resources, and strategy types with institutional performance in the context of Taiwan's HTVE sector.

In addition, this study enhances the current literature on competitive advantage with particular reference to the higher education sector generally, and the HTVE sector in particular. Previous studies have provided an understanding of the factors affecting the competitive advantage of a firm. While the main elements and indicators in existing competitive advantage models are comprehensive, they have not provided a clear understanding of the factors affecting the competitive advantage of higher education institutions. Also, previous studies have not specifically been designed to provide an in-depth understanding of competitive advantage distinctive to the HTVE sector.

While the results obtained from a single area (Taiwan) cannot provide a definitive statement of competitive advantage for the global higher education sector, this study makes a significant tentative contribution. The study has three important aims in addition to contributing to the existing competitive advantage literature and providing a theoretical understanding of this in the context of higher education. The study (i) provides an initial test of the integrated approach for applying the principles of strategic management to educational institutions; (ii) demonstrates the value of a composite framework of competitive advantage for educational institutions; and (iii) provides a

template for further refinement and research into the competitive advantage for the higher education sector generally, and HTVE sector in particular. In this way the study makes a significant theoretical and practical contribution

1.7 Structure of the research

The thesis is presented in nine chapters, outlined as follows:

Chapter One has provided an overview of the research. It has outlined the objectives, contributions and structure of the thesis. Chapter Two focuses on the evolution of Taiwan's technical and vocational education generally and HTVE in particular. It also highlights the strengths and weaknesses of Taiwan's HTVE sector and the opportunities and threats it faces, with a view to addressing the issues for further investigation.

Chapter Three reviews and synthesises the theories relevant to this research, namely industrial organization and resource-based view theories of competitive advantage, and Miles and Snow's (1978) typology of strategy, with the aim of exploring the various factors shaping the competitive advantage of HTVE institutions. Following this, Chapter Four presents a conceptual framework of competitive advantage for HTVE institutions in Taiwan, which integrates the theories outlined in Chapter Three. The various factors determining the competitive advantage of HTVE institutions as well the types of strategy undertaken are identified. Theories of strategic management are integrated to conceptualize the linkages between external industry structure, internal resources, and strategy types with institutional performance.

Chapter Five outlines the method used for conducting the research. It describes the two-stage research design and data collection process. It also outlines how the variables were measured and the data analyzed. Important aspects of research quality, such as validity, reliability and objectivity, are also discussed.

Chapter Six presents the findings of the first stage of the research. It ascertains the elements of competitive advantage originating from both external and internal environments, as well as the indicators measuring different aspects of institutional performance. Chapter Seven presents the findings of the second stage of the research. It identifies the underlying factors of external industry structure, internal resources, and

institutional performance, and classifies types of strategy prevalent in Taiwan's HTVE sector.

In Chapter Eight, the key findings regarding the competitive advantage of HTVE institutions in Taiwan are discussed in relation to the previous research and theoretical perspectives on strategic management. Following this, the conclusions are presented in Chapter Nine, along with key theoretical and managerial implications, limitations and suggestions for future research directions.

CHAPTER 2: LITERATURE REVIEW: STRATEGIC MANAGEMENT

2.1 Introduction

The purpose of this chapter is to provide a theoretical background for this study. Firstly, two perspectives of competitive advantage in the strategic management field, namely industrial organization (hereafter IO) theory and resource-based view (hereafter RBV) theory, are reviewed in order to develop a framework for competitive advantage analysis. Secondly, typologies of strategy generally, and the Miles and Snow's (1978) typology in particular, are reviewed.

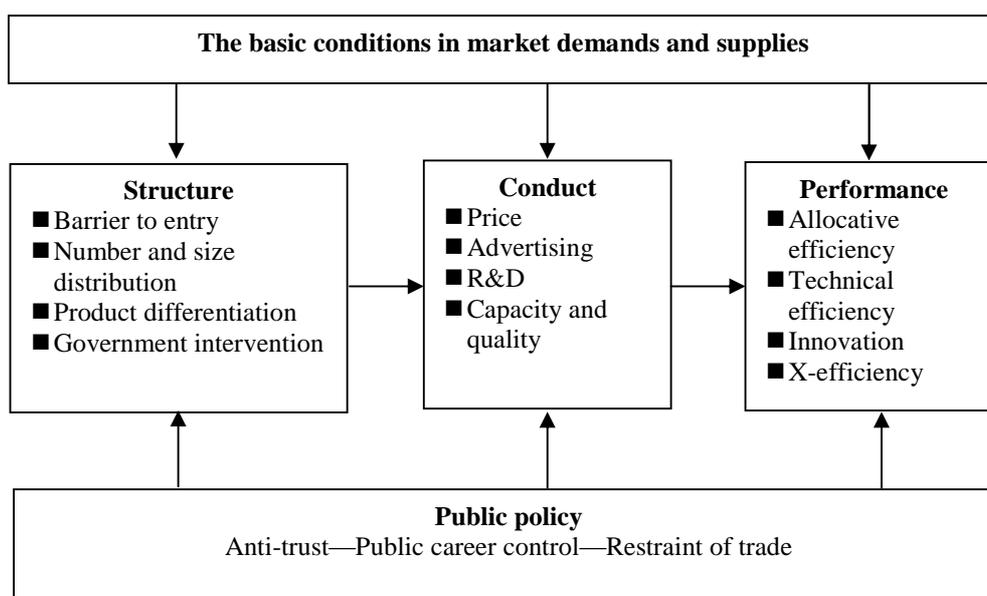
2.2 Industrial Organization (IO) Theory

IO theory developed as a result of strategic management scholars continuing to emphasize the significant influence of industrial structure on a firm's performance (Bain, 1959; Mason, 1939; Porter, 1980, 1981, 1985 & 1990). IO theory offers a systematic model for examining industry competition levels, and proposes a new methodological approach for research on strategic management (Porter, 1981). Within IO theory, a firm is conceptualized as a "bundle of strategic activities aimed at adapting to industry environments by seeking an attractive position in the market arena" (Spanos & Lioukas, 2001, p.907). The competitive advantage resulting from such an 'attractive position' is critically determined by how the firm confronts the challenges of external competitive forces (McGahan & Porter, 1997). The external environment consists of factors that affect a firm and imposes restrictions to which a firm must adapt (Hannan & Freeman, 1976). Two of the most important paradigms in IO theory, namely Mason/Bain's structure-conduct-performance (SCP) paradigm and Porter's (1980) five-force model of competition, are discussed.

2.2.1 Mason/Bain's structure-conduct-performance paradigm

The SCP paradigm, traced back to Mason (1939) and Bain (1959), played a dominant role in the industrial organization field during the third quarter of the twentieth century and still serves as a basic framework in many studies on market power and profitability. According to this paradigm, the structural characteristics of the market determine the conduct of firms, which in turn influence the performance of firms. Figure 2-1 illustrates the relationships between the key variables in the SCP paradigm. The Figure illustrates that structure describes the characteristics of a market (i.e. industry). Conduct

refers to the behaviour and actions of the firms in a market. Performance indicates the degree to which the operations of firms make profits and gain market position in the long-term (Wood, 1999). The SCP approach argues that the success of a firm is the result of certain market structures, which then determine the behaviour and strategic actions of firms and their profitability (Porter, 1981).



Source: Bain (1956)

Figure 2-1 Structure-Conduct-Performance paradigm

The core basis of the SCP paradigm is that the conduct of a firm corresponds to the external environment in which it operates. As a result, industry is the most direct environment that affects the firm’s operation. The structure of industry determines the scope of competition, thus determining the level of underlying profit. The SCP paradigm reinforces the point that not all industries have equal opportunities for profits (Porter, 1980). The merits of the SCP approach are that the reasoning is straightforward and that the structural characteristics of a market (i.e. an industry) can be easily identified (Wood, 1999). However, it should be noted that there are limitations to the SCP approach. The SCP paradigm assumes a unidirectional flow of causality from structure to performance. Porter (1980) argued that causality could run in both directions. In addition, performance can have feedback effects into market structure and firm conduct. Thus, it can be misleading to claim that market structure is the indicator of firm conduct and performance (Hill & Deeds, 1996; Rumelt, 1984). Another

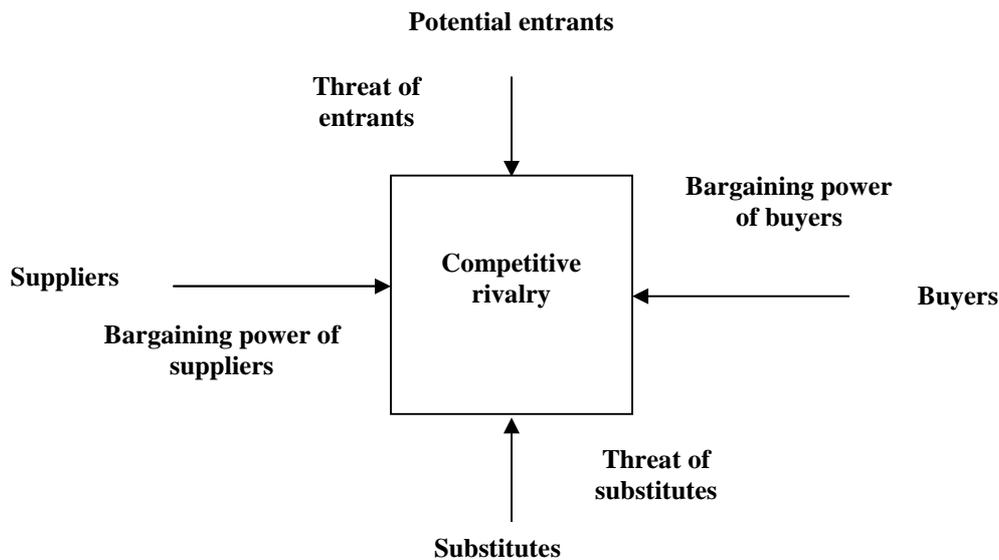
limitation of the SCP approach is that the SCP paradigm employs static analysis. Given a degree of stability, the relationship between market structure and firm performance is always predictable. The competitive advantage of a firm can be sustained over time. However, the industry environment is dramatically changing and it is unlikely that a firm can sustain a competitive advantage if it remains static. Thus, dynamic analysis is required to understand the relative ability of a firm to sustain competitive advantage (McWilliams & Smart, 1993). In other words, future performance cannot be judged only by the current position of firms (Wood, 1999).

2.2.2 Porter's five-force model of competition

Porter's analysis of determinants of competitive advantage is set out in three major publications (Porter, 1980, 1985 & 1990). As outlined in *Competitive Strategy* (1980), it is firmly based on the traditional SCP paradigm of IO concepts, and was up-to-date with newer developments in IO (Foss, 1996). Porter's five-force model of competition (1980) has been widely recognized as a useful analytical framework to classify and assess the intensity of competition and the level of profitability of an industry. It can also be used to assist a firm in finding ways to defend against the competitive forces or to exert its influence on these competitive forces (Porter, 1980). According to Porter (1980), the collective outcomes of five forces (outlined in detail below) govern the intensity of competition of an industry, and the ability of firms in an industry to make profits (see Figure 2-2).

The elements of Porter's five-force model of competition are:

- ◆ Threat of entrants: The seriousness of the threat of entrants depends on barriers that are present and on reactions from existing competitors. Nine major sources of barriers to entry include: economies of scale; product differentiation; capital requirements; switching costs; access to distribution channels; cost disadvantages; brand identity; government policy; and expected retaliation (Porter, 1980).



Source: Porter (1980)

Figure 2-2 Porter's five-force model of competition

- ◆ **Threat of substitutes:** All firms in any particular industry are competing with industries producing substitute products. Identifying substitute products is done by searching for other products that can perform the same function as the product of the industry. Substitute products that deserve the most attention are those that (i) are subject to trends improving their price-performance trade-off with the industry's product; or (ii) are produced by industries earning high profits (Porter, 1980).
- ◆ **Bargaining power of buyers:** Buyers compete with the industry by forcing down prices, bargaining for higher quality services, and playing competitors against each other, all at the expense of industry profitability. A buyer group can be powerful if (i) buyers concentrate purchases in an industry; (ii) buyers purchase large volumes relative to seller sales; (iii) buyers face few switching costs; (iv) buyers poses a threat of backward integration; (v) buyers have all the information they needs; and (vi) buyers purchase products that are standard and undifferentiated (Porter, 1980).
- ◆ **Bargaining power of suppliers:** Suppliers can use their bargaining powers by threatening to raise prices or reduce the quality of purchased goods and services. A supplier group can be powerful if the following apply: (i) labour is a supplier. Scarce,

highly-skilled employees can bargain away industry profitability; (ii) the supplier's product is an important input to the buyer's business; (iii) the supplier group's products are differentiated or it has built up switching costs; and (iv) the supplier group poses a credible threat of forward integration (Porter, 1980).

- ◆ **Competitive rivalry:** Competitors can use such tactics as price competition, advertising battles, product introductions, and increased customer service or warranties to jockey for position. Factors influencing the intensity of competition include slow industry growth, informational complexity, diversity of competitors, high brand recognition, high fixed or storage costs, lack of differentiation or switching costs, capacity augmented in large increments, high strategic stakes, and high exit barriers (Porter, 1980).

Porter's five-force model of competition (1980) is designed to assist in analyzing the relative effect of each of the five competitive forces. All five competitive forces together contribute to the intensity of industry competition and profitability. More specifically, the stronger the force or forces affecting industry competition and profitability, the more important they are in strategy formulation (Porter, 1980). For example, a firm facing no threat of new entrants will earn low returns if the industry is encountered with the threat of superior and lower-cost substitutes. Furthermore, a firm's potential returns will be limited by rivalry among existing competitors, even though there are no substitutes in the industry. Not all five forces will have the same degree of effect on the intensity of competition and profitability in an industry. They will have varying levels of influence in shaping industry competition and profitability. Thus, the formulation of a firm's competitive strategy is dependent on how it aligns with the external environment characterized by the relative strengths of the five competitive forces (Porter, 1980).

2.2.3 Summary and critique of Porter's five-force model of competition

Research drawing from traditional IO has adopted an environment-oriented perspective of strategy and competitive advantage, of which Porter's five-force model of competition (1980, 1985, 1990 & 1991) is probably the most prominent. Porter's model, as a refinement of the SCP paradigm, specifies the role of firms in formulating an appropriate competitive strategy in order to achieve superior performance, while

explaining the competitive nature of an industry in a more concrete manner (Hoskisson, Hitt, Wan & Yiu, 1999). In Porter's five-force model of competition, the extent to which industry structure and firm conduct influence firm performance is explicitly recognized, reflective of traditional IO (Spanos & Lioukas, 2001).

Grundy (2006) argued that Porter's five-force model of competition makes a significant contribution to the field of strategic management, although it is not widely used in a practical sense. According to Grundy (2006), Porter's model, compared to the traditional 'SWOT' analysis, provides managers with a more complete tool to examine the external environment encountered by the firm. It evaluates the threats of new entrants and substitutes as part of an input-output analysis of a specific industry, emphasizes the importance of negotiating power of buyers and suppliers in determining the industry attractiveness and, finally, indicates how competitive rivalry is a function of the other four competitive forces. Grundy (2006) suggests that Porter's five-force model of competition should be made more useful for practitioners by breaking it down segment by segment. In this way, Porter's model will be more context-specific and applicable directly to the firm's situation.

Porter's five-force model of competition not only allows determination of the attractiveness of an industry, but also provides specific insights on industry competition and profitability (Recklies, 2001). A firm's strategic entry and exit decisions can be supported by the five-force analysis. Moreover, Porter's model can be used as a measurement for comparison purposes, investigating the impact of competitive forces on an organization and on its competitors. Since the firm and its competitors may have different strategies to respond to and overcome competitive forces, any actions and reactions may influence the structure of the whole industry. The value of Porter's five-force model of competition is likely to be reduced by the fact that this framework assumes relatively static industry structures and is not able to take into account the dynamics of industry. However, it can still be utilized to enable managers to look closely at the current state of the industry in a structured, easy-to-understand way. In this way, Porter's five-force model of competition serves as a starting point for further analysis of dynamic industry environments.

Wheelen and Hunger (1998) considered Porter's five-force model of competition to be effective tool for understanding where power lies in a particular industry. It enables managers to understand the current competitive position of a firm and build a vision for where it will be in the future. It is worth noting that Porter's model focuses on competition for a firm's long-term viability rather than the toughness of competition among existing rivals. The simplicity of its application has inspired both profit and non-profit organizations (e.g. business schools) to adopt its use.

Porter's five-force model of competition can be readily applied to business enterprises, market segments, industries or regions. McElwee and Pennington (1993) claimed that, although Porter's five-force model of competition was originally designed to consider commercial organizations, it is increasingly relevant to providing an understanding of non-profit educational organizations. This is particularly relevant when higher education institutions behave more like multi-product firms "in which the portfolio of activities is determined by the changing cost of inputs and the changing market conditions for each product range" (Williams, cited in McElwee & Pennington, p.18). Dobni and Dobni (1996) applied Porter's five-force model of competition to assess the state of competition in the Canadian university-based business school industry. The authors indicated that Canada's business schools have become vulnerable to competitive pressures. Strategic reorientation and responses to the competitive pressures, including niche marketing, new product and market development, strategic alliances, organizational revitalization, total quality management, and a focus on core competences and value-added processes, are anticipated on the part of business schools. Collins (1999) examined the dynamics of higher education using Porter's five-force model of competition. He noted that the industry analysis could assist higher education institutions in understanding the underlying factors that may change the competition in an industry. It would be extremely helpful for institutions to understand the dynamics of these factors so that they could determine their strategies accordingly. A more recent study conducted by Martinez and Wolverton (2009) used Porter's five-force model of competition to identify the environmental context in which higher education institutions (e.g. colleges and universities) operate. The authors claimed that Porter's model, which sets the standard for industry analysis, can complement strategic planning and provide a template by which to view higher education.

2.3 The Resource-Based View (RBV) Theory

Due to acknowledged limitations of the SCP paradigm of IO theory, the RBV theory of a firm emerged and has continued to offer an alternative view of the firm. Edith Penrose's (1959) book, *The Theory of the Growth of the Firm*, is considered to be the seminal work in the RBV stream. According to Penrose (1959, p.24):

“a firm is more than an administrative unit; it is also a collection of productive resources the disposal of which between different users and over time is determined by administrative decision. When we regard the function of the private business firm from this point of view, the size of the firm is best gauged by some measure of the productive resources it employs.”

The RBV theory, in contrast to IO theory, conceives of the firm as a broad collection of resources, which are in essence “anything which could be thought of as a strength or weakness of a given firm” (Wernerfelt, 1984, p. 172). Examples of resources provided by Wernerfelt (1984) are brand name, in-house knowledge of technology, employment of skilled personnel, trade contact, machinery, efficient procedures and capital. As such, both tangible and intangible assets are considered a firm's resources. They are closely tied to the firm within a given period of time. Barney defined firms as:

“bundles of productive resources, [including]... all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by the firm that enables the firm to conceive of and implement strategies that improve its efficiency and effectiveness.” (1991, p. 101)

The RBV theory focuses on the importance of a firm as the critical unit of analysis; this is in contrast to IO theory, which takes the importance of individual industry as the critical unit of analysis (Spanous & Lioukas, 2001). Therefore, from the viewpoints of RBV, firms should analyze their internal resources rather than external environment.

RBV theorists highlight that not all resources are important for sustaining competitive advantage. Barney (1991) developed the VRIN (valuable, rare, imperfectly imitable and non-substitutable) framework associated with resources. He defined resources as valuable “when they enable a firm to conceive of or implement strategies that improve

its efficiency and effectiveness” (1991, p.106). However, valuable resources that are commonly shared by the majority of firms are incapable of being either a competitive advantage or a sustainable competitive advantage. Only resources that other firms cannot easily develop, possess and obtain would become costly-to-imitate resources. Finally, non-substitutable resources refer to the resources that have no strategic equivalents, such as firm specific knowledge or trust-based relationships.

Barney’s (1991) work extended the RBV theory to incorporate the concept of sustainability into the strategic management of a firm. Similarly, Grant (1991) argued that durability, transparency, transferability, and replicability are the four major attributes of resources determining sustainable competitive advantage. Whereas Amit and Schoemaker (1993) suggested that resources should meet the following eight criteria: complementarity; scarcity; low tradability; inimitability, limited substitutability; appropriability; durability; and overlap with strategy industry factors.

In contrast to the IO perspective, the RBV theory suggests that the resources that are inherent in a firm are the sources of competitive advantage, and the value of a firm’s internal resources can be enhanced and sustained, if they meet the above mentioned criteria. That is, they are valuable, rare, imperfectly imitable, and non-substitutable (Barney, 1991; Grant, 1991; Amit & Schoemaker, 1993).

2.3.1 Classification of resources

Within the field of RBV theory, the term ‘resources’ appears to be used in a very broad sense. For Barney (1991), firm resources can be categorized into three groups: physical capital resources (i.e plant and equipment, geographic location, and access to raw materials); organizational capital resources (i.e formal reporting structure, formal and informal planning, controlling and coordinating systems, and informal relations among groups within a firm and between a firm and those in its environment); and human capital resources (i.e training, experience, judgement, intelligence, relationships and insight of managers and employees in a firm). Similarly, six major categories of resources were suggested by Hofer and Schendel (1978), as follows:

- ◆ financial resources, including cash-flow, cheque, bank deposit, and loan ratio;

- ◆ physical resources, including practical technique, plant and instrument, geographical position, and raw material;
- ◆ human resources, including experience, judgement, talent, social relationships, and training systems;
- ◆ technological resources, including patent, knowledge, and research and development ability;
- ◆ reputation, including well-known degree, laudatory degree, credit ranking, social status, and customer loyalty; and
- ◆ organizational resources, including formal report structure, formal and informal planning, and control and co-operative systems.

There was no explicit distinction made between resources and capabilities in the early contributions to RBV theory. Grant (1991), however, posited that resources are input factors of the production process, and capabilities are the capacity of the firm to utilize resources to perform some tasks and activities in an integrative way. He stated: “While resources are the sources of a firm’s capability, capabilities are the main source of its competitive advantage” (Grant, 1991, p. 119). Specifically, a firm’s capabilities are “what it can do as a result of teams of resources working together” (Grant, 1991, p.120). Amit and Schoemaker (1993) distinguished between resources and capabilities, adopting the following description: resources are a bundle of assets that are either owned or controlled by a firm, whereas capabilities refer to its ability to exploit and combine existing resources, through organizational learning and routine, in order to achieve a desired outcome. Hill and Deeds (1996, p.433) further interpreted a firm as being composed of “hardware” and “software”. The hardware can be viewed as a collection of resources such as people, buildings, equipment, and land, whereas the software of the firm refers to a collection of organizational routines for coordinating a variety of resources in order to convert inputs to outputs. For Hill and Deeds (1996), it is the software, a firm’s routines, that determine the relative profitability and hence the competitive advantage of firms.

The subject of firm capabilities as one source of competitive advantage has been widely discussed in the literature on RBV theory. The term ‘distinctive competence’, for example, was first used by Selznick (1957) to refer to the activities that a firm tends to

perform especially well in comparison to its competitors within a similar environment (Snow & Hrebiniak, 1980). Snow and Hrebiniak (1980) adopted the concept of 'distinctive competence' and classified this into 10 functional areas: general management; financial management; marketing and selling; market research; product research and development (R&D); engineering; production; distribution; legal affairs; and personnel.

Prahalad and Hamel (1990) introduced the term 'core competencies' as "the collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technologies" (p.82). A core competency, first, provides "potential access to a variety of markets"; second, makes "a contribution to the perceived customer benefits"; and third, is "difficult for competitors to copy or imitate" (p.83-84).

Teece, Pisano and Shuen (1997) proposed the 'dynamic capabilities' framework with a view to developing a new perspective for the strategic management of a firm in a greatly changing environment. According to Teece et al. (1997), the term 'dynamic' refers to the capacity to renew competencies so as to achieve congruence with the changing business environment, and the term 'capabilities' refers to a firm adapting, integrating and reconfiguring internal and external organizational skills, resources, and competencies to match the requirements of the changing environment. The authors viewed dynamic capabilities as a firm's ability to upgrade and renew its competencies to meet the rapid changes of the industry's environment and, in turn, to achieve new and innovative forms of competitive advantage. These dynamic capabilities encompass organizational and managerial processes (i.e. coordination and integration, learning and reconfiguration), specific asset positions (i.e. technological, financial, reputation), and path dependencies (i.e. the firm's history).

The preceding discussion suggests that there are two types of approaches that explain RBV theory. One is to identify the role of the resources of a firm and how these resources affect strategy formulation and, in turn, achieve competitive advantage. The other is to examine the role of a firm's capabilities in utilizing and integrating its resources so as to achieve and sustain competitive advantage. The view that considers a firm as a bundle of resources can be considered a narrow view of RBV theory. Its most

important contribution is to simply convert the outward view into an inward view of the source of competitive advantage. For example, Penrose (1959) argued that the motivation, direction and high-point of development of a firm comes from internal resources rather than outer environmental elements. Wernerfelt (1984) proposed that a firm should find the heterogeneity of its internal resources, not merely examining the dynamism and heterogeneity of its external environment. Grant (1991) elaborately analyzed the logic of how the inner resources bring about and determine competitive advantage and industrial attraction. Based on their empirical research, Buzzell and Gale (1987) found that differences in profitability within industries are much more important than differences between industries, and they believed that internal factors are more important. In this narrow view of RBV, resources with static characteristics are the single elements in firms with little dynamic development (Reed & DeFillippi, 1990). Capabilities, which are referred to as the ability of a firm to exploit, integrate, and upgrade existing resources, are scarcely mentioned at this stage.

The view that considers a firm as a collection of capabilities that exploit its unique resources, offers a broader view to explain RBV. This theory argues that resources have a more dynamic character if they can be exploited through the inherent capabilities/competencies of a firm. In this sense, the RBV theory suggests that the possession and deployment of capabilities/competencies could also contribute to the competitive advantage of a firm. The concepts of core competencies and dynamic capabilities of a firm in determining competitive advantage are considered to be the extension of the theoretical base of the RBV theory. It does not, however, simply seek to prove whether the source of competitive advantage comes from external or internal factors. For example, Barney (1991) regarded capabilities as more important than inner strategic assets. Verona (1999) referred to RBV theory as the combination of technological capabilities, marketing capabilities, and internal and external integrative capabilities. Prahalad and Hamel (1990) suggested that a firm should not stay at a level of single resources, and that core competencies are the most crucial in developing competitive advantage.

While some researchers conclude that the RBV theory is an internally-oriented theory, others regard the capabilities-based view of the firm as extensions of RBV theory (e.g. Snow & Hrebiniak, 1980; Prahalad & Hamel, 1990; Teece et al., 1997). Indeed, these

two types of understandings are connected, where the former is the foundation of the latter. Figure 2-3 demonstrates the evolution of the RBV theory and the shifting emphasis and definition of RBV theory.

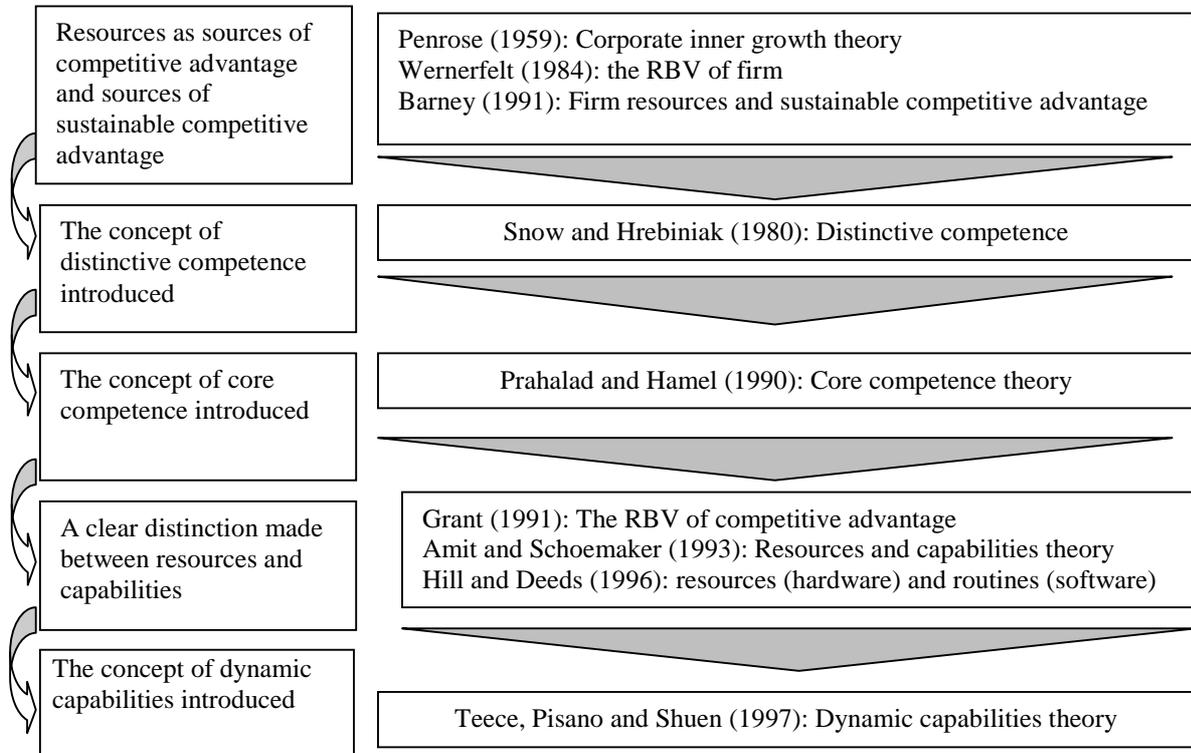


Figure 2-3 Evolution of the RBV theory

2.3.2 Summary and critique of RBV theory

The RBV theory of a firm questions the dominance of IO theory and has created a new era of internally-oriented logic. It emphasizes the value of internal resources to the growth, profit-earning and competitive advantage of a firm, and argues that firms differ in their performance across time because of differentials in their resources rather than the conditions and trends in the external environment. However, it is worth noting that the possession of resources still cannot promise the success of a firm in the market. This is because rivals can erode competitive advantage through depreciation and imitation (Grant, 1991). The speed of erosion depends critically upon the characteristics of a firm's resources (Reed & DeFillippi, 1990). Resources that are simultaneously valuable, rare, hard to copy, and non-substitutable have the potential to bring sustainable competitive advantage (Barney, 1991). The four main elements for the sustainability of competitive advantage derived from a firm's resources are durability, transparency,

transferability, and replicability (Montgomery & Hariharan, 1991). In other words, the unique resources that a firm can own are those that are durable, difficult for competitors to identify and understand, imperfectly transferable, not easily replicated and directly owned and controlled by the firm (Amit & Schoemaker, 1993). They are the “crown jewels” of a firm and need to be protected (Grant, 1991).

Previous studies have generated several lists of a firm’s resources that may contribute to heterogeneity and, in turn, competitive advantage (Hofer & Schendel, 1978; Snow & Hrebiniak, 1980; Barney, 1991; Verona, 1999). Given that a firm’s resources should further include all its capabilities to effectively deploy and integrate tangible and intangible assets from the viewpoints of RBV theory, the elements derived from previous studies can be broadly classified into six categories. These are as follows: organizational resources; human resources; financial resources; physical resources; marketing capabilities; and product R& D capabilities. This classification framework includes all physical, non-physical, personnel and organizational resources in a firm. It serves as the basis of this study to examine the relative influence of these six types of resources on strategy type and institutional performance in the context of Taiwan’s HTVE. This suggests that an educational institution should conduct an analysis of its internal resources following external environmental analysis. The purpose the internal analysis is to identify the bundle of unique assets that the institution has (its strengths) and lacks (its weaknesses). The rationale is that an educational institution should pursue goals, opportunities, and strategies that are suggested by, or congruent with, its strengths and avoid those where its resources would be too weak (Kotler & Murphy, 1981).

2.4 Strategy types

The term ‘strategy’ originates from the Greek word ‘strategos’, referring to what a military commander does (Mintzberg & Quinn, 1998). Chandler (1962), a pioneer of research in this field, concluded that strategy was the key mechanism used for charting a new direction, and its impact on organizational structure and performance was substantial. In Chandler’s view, strategy refers to “the determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals” (1962, p.13). Ansoff (1965) viewed strategy as “decision rules and guidelines” required by a firm for its

“orderly and profitable growth” (p.103). Mintzberg (1978) argued, however, that such definitions treat strategy as (i) explicit; (ii) developed consciously and purposefully; and (iii) made in advance of the specific decisions to which it applies (p. 935). Mintzberg (1978) enriched the understanding of strategy by developing the notions of deliberate strategy and emergent strategy. The first relates to the effective implementation of the strategic decisions taken by managers. The second originates not in the mind of managers, but in the interaction between the firm and its external and internal environments. A deliberate strategy is more commonly applied to stable and predictable conditions, while emergent strategy is a prompt response of a firm to environmental uncertainties. According to Mintzberg (1978), the concept of strategy has been defined as a “pattern in a stream of decisions” (p.935). These decisions will usually be directed at maintaining an organization’s alignment with its environment and managing its major internal interdependencies.

Several strategy typologies have been developed to classify and describe the strategic behaviour of firms. As noted by Namiki (1989), there are two major streams of research on strategy typologies. IO theory focuses on the impact of external environment on the firm. On the other hand, RBV theory focuses on the impact of internal resources on the firm. Strategy typologies are classification schemas that provide “a means for ordering and comparing organisations and clustering them into categorical types” (Rich 1992, p. 758). Researchers use strategy typologies “to provide a parsimonious framework for describing complex organizational forms and for explaining outcomes” (Doty & Glick 1994, p.230).

There have been several notable attempts to derive more generalizable typologies for classifying different strategic behaviours. Two important typologies that have emerged from such efforts are those of Porter (1980 & 1985) and Miles and Snow (1978). In coping with the five competitive forces, Porter (1980) suggested three types of strategy to be used to match particular industry foci and in turn build competitive advantage, namely: (i) cost leadership; (ii) differentiation; and (iii) focus. In cost leadership, a firm aims to become the low cost producer in its industry. When adopting a differentiation strategy, a firm seeks to be distinctive in its industry through features of its product quality, design, brand name, service, and so on. When adopting a focus strategy, a firm concentrates on a narrowly defined market niche and undertakes either the cost

leadership or differentiation approach in its industry. As noted by Walker and Ruekert (1987), Porter's (1980 & 1985) typology concentrates on exploring the appropriate fit between the three strategies and aspects of an industry environment, particularly the forces driving industry competition. This typology is drawn from individual case studies of a variety of businesses, although Porter (1980 & 1985) has relatively little to say about the kinds of organizational structure, processes, or programs necessary to implement each strategy effectively. This can be a major limitation if one wants to explain the kinds of strategic actions undertaken by a firm through the deployment of its resources and capabilities (Walker & Ruekert, 1987).

Miles and Snow's (1978) typology of strategy overcomes the above-mentioned criticism. Their typology focuses on the processes an organization adopts to adapt to the external environment in which it operates (Namiki, 1989). A detailed description of Miles and Snow's typology is provided below in Section 2.4.1. Smith, Guthrie and Chen (1989) suggest that Miles and Snow's typology is a theoretical framework of "fit" or co-alignment, interrelating organisational strategy, structure and process with external environments. This notion of "fit" was further refined by Miller (1992). According to Miller, internal fit refers to the extent to which the firm's strategy, structure and processes complement its strategy. In comparison, external fit refers to the extent to which the firm's strategy relates to the external environment in which it operates. As Miles and Snow's typology emphasizes the importance of both internal and external fit, firms should seek distinctive and relatively enduring patterns of strategic behaviour that co-align the organisation with its environment (Miller, 1992). This was supported by McDaniel and Kolari (1987) who noted that Miles and Snow's typology is a useful theoretical framework for analyzing the ways in which firms interact with their environment and the strategies they adopt in response to changes external to the firm.

Miles and Snow's 1978 *Organizational Strategy, Structure, and Process* has exerted considerable influence over the field of strategic management (Hambrick, 1983). By 2003 there were over 1,100 scholarly works citing the book, most of which have paid particular attention to Miles and Snow's typology of strategy (Ketchen, 2003). Due to its strong theoretical orientation and generalizability, when compared with Porter's (1980) classification scheme of generic strategies, Miles and Snow's typology has been widely accepted (Snow & Hrebiniak, 1980; Hambrick, 1983; Smith et al., 1989; Zahra

& Pearce, 1990; Shortell & Zajac, 1990; Conant, Mokwa & Varadarajan., 1990; Parnell & Wright, 1993; Woodside, Sullivan & Trappey III, 1999; Desarbo, Benedetto, Song & Sinha, 2005; Olson, Slater & Hult, 2005).

2.4.1 Miles and Snow's typology of strategy

According to Miles and Snow (1978), strategy is the pattern of decisions by which a firm aligns with its internal and external environments. Miles and Snow (1978) identify three sets of problems confronting every firm: the entrepreneurial, engineering, and administrative problems. The entrepreneurial problem deals with the choice of a specific product or service and a target market that a firm attempts to serve (i.e. the strategic choice of a firm's product-market domain). The engineering problem involves creating a system to allow a firm to put into actual operation the solutions to the entrepreneurial problem. The administrative problem focuses on how a firm strives to rationalize and stabilize the activities that have successfully solved problems during the entrepreneurial and engineering phases. Miles and Snow's typology (1978) identifies four archetypes: Prospectors, Analyzers, Defenders, and Reactors. Each type is discussed briefly within the context of the three sets of problems identified above.

- ◆ Prospectors are defined as firms that “continually search for market opportunities and which regularly experiment with potential responses to emergent environmental trends” (Miles & Snow, 1978, p.29). These firms continually create changes to which their competitors must respond. Because prospector firms are more concerned about product and market innovation, they are unlikely to be efficient in operations (Miles & Snow, 1978).

- ◆ Analyzers are firms that “operate in two types of product-market domains, one relatively stable and the other changing. In their stable areas, these firms operate routinely and efficiently through the use of formalized structures and processes. In their more turbulent areas, these firms watch their competitors closely for new ideas and then rapidly adopt those which appear to be most promising” (Miles & Snow, 1978, p.29). These firms have a greater preference to adopt a “second-but-better” strategy (Desarbo et al., 2005, p.47). They are rarely “first movers” (Miles & Snow, 1978, p.29).

- ◆ Defenders are firms that attempt to maintain a secure niche for a narrow range of products or services in a relatively stable market, adopting a conservative view of new product and market development (Miles & Snow, 1978). Due to this narrow focus, these firms “devote primary attention to improving the efficiency of existing operations” (Miles & Snow, 1978, p.29).

- ◆ Reactors are the firms that frequently perceive changes and uncertainty occurring in the external environment, but are unable to respond to them effectively (Miles & Snow, 1978). Because these firms lack consistency in their strategic approach, and strategic responses to environmental pressures are usually inappropriate, they “seldom make adjustments of any sort until forced to do so by environmental pressures” (Miles & Snow, 1978, p.29).

Miles and Snow (1978) postulated that firms within a given industry are heterogeneous, exhibiting identical patterns of behaviour. The key factor underlying this typology is the manner in which each solves the entrepreneurial program, that is, the strategic management of its products and markets (Hambrick, 1983). Table 2-1 illustrates the principal variables employed by previous studies in differentiating the firm’s response to changing environmental conditions and the speed with which it modifies its products or markets to maintain alignment with its environment (Smith, et al., 1989).

Table 2-1 Miles and Snow strategy continuum

Variable	Defender	Analyzer	Prospector
◆ Marketing definition	Narrow	Combination	Broad
◆ Customer base stability	Stable	Combination	Unstable
◆ Environmental monitoring	Narrow	Combination	Wide
◆ Product mix stability	Stable	Combination	Changing
◆ Marketing approach	Maintain customer base	Combination	Create change in customer base
◆ Competitive edge	Low cost	Combination	Innovation
◆ Growth pattern	Steady	Combination	Spurts
◆ Attitude toward growth	Cautious	Combination	Aggressive

Source: Smith, Guthrie & Chen (1989)

2.4.2 Empirical applications of Miles and Snow’s typology

A rich body of research has been undertaken using Miles and Snow’s (1978) typology of strategy. For example, Snow and Hrebiniak (1980) investigated the relationships between strategy, distinctive competencies, and organizational performance. Their study

covered 100 businesses in the plastic, semiconductor, automotive, and air transportation industries. Based on the perceptions of top management, the findings indicated that Defenders and Prospectors had distinct and identifiable configurations of distinctive competencies. Distinctive capabilities of Analyzers were less apparent and varied significantly across industries. Reactors, as expected, lacked consistent patterns of distinctive competencies. The study also indicated that Defenders, Prospectors, and Analyzers tend to perform better than Reactors in industries characterized by intense competition.

Hambrick (1983) explored how industry environment influenced the choice of Miles and Snow's four strategy types, and how these four strategy types differed in their functional tendencies. He reported that Defenders and Prospectors differed in their performance tendencies, according to the nature of the operating environment and the measurement of organizational performance. Prospectors tend to suffer low profits and cash flows in every pattern of environment examined (e.g. growth, mature, non-innovative and innovative industries). This is particularly the case when Prospectors engaged in "unnecessary" adaptation and invest a lot of expenditure in non-innovative industries (p.24). However, Prospectors were superior to Defenders in terms of market share gains, and were rewarded for their adaptive stance in innovative industries.

Smith et al. (1989) conducted a study of 47 electronic manufacturing firms to examine the relationships between organizational size and performance with Miles and Snow's strategy types. The results indicated a support for the typology in terms of the specific characteristics of the four strategy types. Prospector firms had the following characteristics (Smith et al., 1989, p.46):

"an unstable customer base, a changing product mix, a competitive edge in innovation, a *creating change* approach attitude toward growth. Furthermore, this group is managed primarily by research and development personnel who are relatively young, less tenured and who have been recruited from outside of the organization."

While Analyzer firms were found to have a balanced mixture of product variety and diversity, the major characteristics of Defender firms included "a stable product base, an

aggressive approach to maintaining their customer base, a low price competitive edge, and a product design approach that is based on production capability” (p. 48). Finally, Reactor firms, as expected, lacked a consistent approach to entrepreneurial, engineering and administrative problems. The results supported Miles and Snow’s (1978) contention, illustrating that Defenders, Analyzers and Prospectors perform equally well and are superior to Reactors. Additionally, differences in the choice of firm strategy and performance can be best explained by organizational size. Defenders tend to perform better as smaller firms, while Prospectors perform better as larger firms.

Zahra and Pearce (1990) carried out a thorough review of research evidence related to the Miles and Snow’s typology. The results, from a number of empirical studies, strongly supported Miles and Snow’s (1978) propositions that four types of strategies do exist in different environments. In addition, significant differences in organizational performance exist among the four types of strategies. The assumption that Defenders, Analyzers and Prospectors will outperform Reactors has been strongly supported. Shortell and Zajac (1990) undertook a study to examine the reliability and validity of Miles and Snow’s (1978) typology. Using both perceptual self-typing and archival data from multiple sources, their findings indicated that Prospectors and Analyzers scored significantly higher on planning process formality than Defenders, supporting Miles and Snow propositions. The purpose of a more formal planning system is to facilitate exploration of new market opportunities and taking appropriate action to respond to a quickly changing environment.

Conant et al. (1990) found that although Prospectors have higher levels of marketing competence than Analyzers and Defenders, they performed equally well in terms of profitability, and even outperformed Reactors. Parnell and Wright (1993) examined the relationship between strategy and performance in a volatile, dynamic and growing industry. The results supported the expected relationship that Prospectors, Analyzers and Defenders outperformed Reactors. Specifically, Prospectors enjoyed higher sales growth compared with the other strategy types; while Analyzers produced higher return on assets compared to other strategy types. Since this study was limited to a single industry, the expected relationships may differ for other industries and further investigation is needed.

Woodside et al. (1999) conducted a multi-industry, cross-section study to examine the relationships across strategy types, distinctive marketing competencies, and organizational performance. Their study concluded that Prospectors, Analyzers and Defenders perform better than Reactors with regard to distinctive marketing competence, and there is a positive association between strategy types and organizational performance. Prospectors consistently outperform Defenders, who in turn outperform Reactors. Using a sample of 228 senior marketing managers, Olson et al. (2005) claimed that each strategy type is specifically linked to a number of different combinations of organizational structural characteristics and structural behavioural emphases. A study conducted by DeSarbo et al. (2005) is an extensive test of the long-established Miles and Snow's (1978) typology. Their study validated Miles and Snow's typology by using survey data gathered from 709 firms in three different countries (China, Japan and the United States of America). Their findings indicated that firms have to continuously strengthen their capabilities in such areas as marketing, technology, market-linking, information technology and management.

The preceding discussion indicated that Miles and Snow's (1978) contribution to the field of strategy has generated research relevant to this study (Snow & Hrebiniak, 1980; Hambrick, 1983; Smith et al., 1989; Zahra & Pearce, 1990; Shortell & Zajac, 1990; Conant et al., 1990; Parnell & Wright, 1993; Woodside et al., 1999; Desarbo et al., 2005; Olson et al., 2005). Some of the research has examined the effect of industry characteristics on firm performance (i.e. innovative and non-innovative industries across different countries), while other research has explored the extent to which firm characteristics (i.e. size of the firm, organizational structure, distinctive competencies) determine its performance.

The review of empirical studies related to Miles and Snow's (1978) typology has provided strong support for the proposition that the formulation and implementation of a competitive strategy relies on the best fit of the characteristics of a firm with the external environment in which it operates. Furthermore, performance differences exist among the four types of strategy (Miles & Snow, 1978). Both internal and external environments may influence the strategy-performance relationship, in which internal environment relates to the firm characteristics, such as size, structure and competence.

The external environment relates to external influences such as growth/maturity, stability/turbulence, non-innovative/innovative.

2.5 Integration of IO and RBV theories

A review of strategic management literature indicates that two important schools of thought have emerged that seek to explain the strategy and competitive advantage of a firm. RBV theory focuses on firm effects, whereas IO literature emphasizes industry effects as critical determinants of competitive advantage and superior performance. The substantive differences between these two theoretical perspectives are highlighted in Table 2-2. Firstly, in Porter's framework (1985, 1991), a firm can be seen as a series of activities (i.e. strategy) attempting to adapt to environmental changes and secure a competitive position. Firm resources are valuable in and of themselves only when they allow firms to perform activities in response to the industry environments. In contrast to Porter's (1985, 1991) framework, the RBV approach looks at a firm as a bundle of resources that are tied to the firm (Wernerfelt, 1984; Barney, 1991; Grant, 1991). Firm resources are inherent in the firm's operation, driving the choice of strategy and performance. Furthermore, Porter (1985, 1991) claimed that strategy is driven primarily by industry environments, while strategy, from the RBV perspective, is determined by the firm's unique resources and capabilities, which in turn are seen as the main source of competitive advantage.

Table 2-2 Differences between IO and RBV theories

Dimensions	IO theory	RBV theory
1. Starting point of analysis	The industry	The firm
2. Firm characteristics	Typical of the industry	Unique by different resources
3. Source of competitive advantage	Good industry	Good resources and competencies
4. Industry characteristics	Fixed, established, well-developed	Variable, in evolution and difficult to define
5. Management method inferred	Portfolio of businesses	Portfolio of competencies
6. Sustainability of the competitive advantage	Depends on five-forces	Depends on the heterogeneity, the imperfect mobility, imitability and substitutability of the resources
7. Strategic options	Cost-leadership and differentiation	Depends on competencies and core products
8. Resources allocation	Allocated to the business units	Transversal to the business units

Adapted from: Teece et al. (1997)

It is clear that IO and RBV theories have different features. While both have been contradictory regarding the origin of competitive advantage, they have also made

significant and complementary contributions to the strategic management field (Amit & Schoemaker, 1993; Foss, 1996; Conner, 1991; Hoskisson et al., 1999). According to Spanos and Lioukas (2001), the attempt to integrate two perspectives within the composite framework is justified on the basis of three reasons: (i) the two perspectives are complementary in explaining the firm's performance. A more balanced view of the sources of competitive advantage can be gained by drawing insights from both perspectives; (ii) both perspectives attempt to explain the origin of a firm's competitive advantage; and (iii) the firm is the critical unit of analysis in both cases.

In fact, several contributors to the strategic management literature have proposed the integration of IO and RBV theories in different ways and with varying degrees of emphasis (Amit & Schoemaker, 1993; Barney, 1991; Conner, 1991; Foss, 1996; Hoskisson et al. 1999). Foss, (1996) for example, argues that industry analysis, which emphasizes a firm's reaction to the five competitive forces of industry, provides the 'opportunities-threats' part of the overall SWOT framework, while the resource-based approach, which emphasizes a firm's capabilities to utilize resources, supplies the 'strengths-weaknesses' part. In this respect, the two approaches cover different domains of application within the context of SWOT analysis and are complementary in the pursuit of competitive advantage for a firm (Barney, 1991). Conner (1991) claims that the simultaneous interaction of the following three forces drives firm performance: (i) the firm's own assets; (ii) the competitors' assets; and (iii) industry environment and public policy constraints. A proper strategy formulation to optimise performance must consider both the external environmental influences and the firm-specific elements in order to be successful. Similarly, Amit and Schoemaker (1992, p.67) considered the so-called "strategic vision" as a unified concept that incorporates characteristics of the IO and RBV approaches. The choice of strategy is determined not only through the analysis of firm resources and capabilities, but also through industry analysis. Amit and Schoemaker (1993, p.37) argue that the profitability of a firm derives from the fit between "strategic assets" and "strategic industry factors". Strategic assets are specific to a firm, difficult to imitate or trade, whereas strategic industry factors are "determined at the market level through complex interactions among the firm's competitors, customers, regulators, innovators external to the industry, and other stakeholders" (Amit & Schoemaker, 1993, p.39). Amit and Schoemaker insisted that the firm's bundle of

resources and capabilities should be aligned with a particular industry setting in order to make sufficient profits.

Spanos and Lioukas (2001) said that the integration of IO and RBV theories is appropriate. Their study has provided sufficient evidence to confirm that industry and firm specific effects are complementary in explaining different dimensions of firm performance. Hoskisson et al. (1999) stated that there will be an increasing trend towards the integration of IO and RBV theories in future research on strategic management in order to achieve a balance between internal and external explanations of the complex relationship in any dynamic and new competitive landscape.

2.6 Summary

This chapter examined the IO and RBV theories of competitive advantage as well as Miles and Snow's (1978) typology of strategy in relation to the development of the proposed conceptual framework. These theories provide an effective basis for investigating the major research themes of this study. The background of the research context, Taiwan's HTVE sector, is outlined in Chapter Three.

CHAPTER 3: TAIWAN'S HIGHER TECHNICAL AND VOCATIONAL EDUCATION SECTOR

3.1 Introduction

The purpose of this chapter is to contextualise the research. First, international literature on the higher education sector is reviewed. Taiwan's education system and the historical development of the HTVE sector since the 1950s is then outlined. This is followed by a description of significant structural changes in Taiwan's HTVE sector and an external environmental analysis of that sector.

3.2 Higher education: an international review

Higher education is critical to the social and economic future of all nations. In an age of knowledge, in which educated people and their ideas have become the basis for establishing the wealth of nations, the value of higher education has become more important. Nations need to educate more of their young people to a higher standard, with a degree now the basic qualification requirement for many skilled jobs. The quality of knowledge generated within higher education institutions, and its availability to the wider economy, is becoming increasingly critical to national competitiveness.

Recently, higher education has come under increasing pressure, particularly in developed nations. The cost of operating an educational institution is on the rise. For example, the issues that Canadian higher education institutions are facing include: over budget and under-funded; intensified rivalry; setting priorities; moving at the speed of cyberspace; rethinking infrastructure; linking programs to outcome; attracting and retaining talented faculty; enhancing environmental performance; tackling diversity, accessibility and affordability; and requiring the highest level of transparency and accountability (Deloitte, 2011).

Similarly, higher education in the United Kingdom (UK) is facing fundamental and unprecedented competitive pressures due to lower government funding. Higher education institutions are competing against one another for the best students, the highest quality staff and research funding from the UK government (Lynch & Baines, 2004). Piatt (2011) further noted that there are two major challenges eroding the UK's long-standing competitive advantage in higher education. The first challenge is

increased costs of conducting teaching and research activities in order to provide students with a world-class learning experience. The second challenge is increased global competition. The UK's competitors, both developed and developing nations, are increasingly prioritizing research and higher education as they seek to create more skilled workforces, stimulate socio-economic mobility and strengthen their economic competitiveness. Thus, a higher education system that embraces diversity rather than homogeneity will enable the UK's higher education sector to compete effectively in a global marketplace.

America higher education is facing complex challenges (Rosenstone, 2004). First, the rise in tuition fees due to the cut to the education funding has put at risk the ability of public colleges and universities to serve the people of its nation. Second, gender, racial, ethnic and social class inequalities in access to higher education have diminished the ability of the nation to harness the creative energies of its people and ensure opportunities for social and economic mobility. Third, the growing gap in resources between public and private institutions has led to the disparity in the respective abilities of these institutions to recruit and support outstanding students and faculty, sustaining cutting-edge research, and providing high quality education. Fourth, cut in public investment in higher education, declining access to higher education, and increased barrier to the ability to recruit faculty and students from other countries have weakened American's competitive position in global markets. Finally, the combination of rising costs and reductions in government support has forced the universities to cut investment in R&D that are likely to facilitate major scientific breakthroughs.

Higher education in Australia is also under great pressure to change in recent times. The major factors that are thought to be the key drivers of change within the higher education sector interact in complex ways and are: the growing quantum of demand for places in higher education and the changing nature of that demand as a result of increased opportunities for lifelong learning; the move from a highly regulated higher education system to an open market; the application of communication and information technologies; and changed funding arrangements for higher education reflecting demographic changes (Curtis, 2000). Under these conditions, established higher education institutions will need to adjust to the new environment and, in order to compete with new providers, many will need to make changes to their operations,

addressing pedagogy, service standards, and input costs. It seems that a more diverse higher education sector would emerge as each institution develops strategies to enable them to compete successfully.

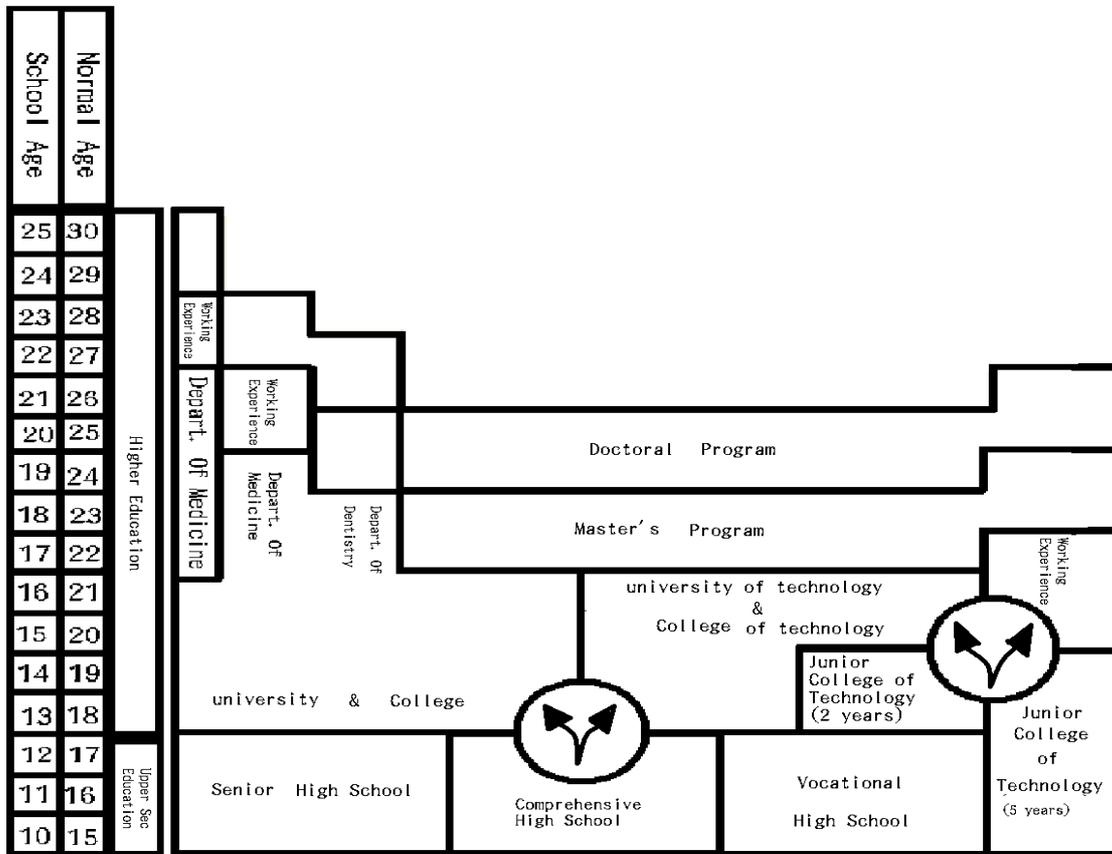
Finally, in most developing countries, higher education exhibits severe deficiencies, with the expansion of the system an aggravating factor. According to the report released by The Task Force on Higher Education and Society (2000), demand for increased access is likely to continue, with the public and private sectors seeking to meet it with an array of new higher education institutions. Rapid and chaotic expansion is usually the result, with the public generally underfunded and the private sector having problems establishing quality programs that address any other than short-term, market-driven needs. A lack of information about institutional quality makes it difficult for students to make choices about their education, making it hard to enlist consumer demand in the battle to raise standards. Developing countries are left with a formidable task, expanding their higher education system and improving quality, all within continuing budgetary constraints.

The international literature focuses on big picture issues faced by higher education institutions around the world and provides some insights into the challenges faced by Taiwan's higher education sector now and in the future.

3.3 Taiwan's education system

The education system in Taiwan can generally be divided into four levels: preschool; nine-year compulsory; secondary education; and higher education. After completing their secondary level education, higher education is not compulsory for students. Higher education incorporates undergraduate and postgraduate education. Higher education, as a significant industry in its own right, is important to national economies, because it provides a source of trained and educated personnel for the rest of the economy (Richards, 2007). Higher education in Taiwan consists of two tracks: the academic track (higher general education) and the vocational track (higher technical and vocational education - HTVE). Higher general education is contrasted to HTVE as it concentrates on both theory and practice, whereas the latter emphasizes practical skill development and is employment-oriented (Department of Technological and Vocational Education, 2008).

Figure 3-1 diagrammatically represents the HTVE system in Taiwan. As can be seen in this Figure, technical and vocational education in Taiwan is provided at three levels: senior vocational schools; junior colleges; and institutes of technology/universities of science and technology. The latter two fall into the category of HTVE institutions. The purpose of senior vocational education is to cultivate and train students in basic skill development for entry-level work. It is offered both in the daytime and evening and comprises a wide range of programs, such as co-operative education programs, practical skills programs, special needs programs and supplementary programs. Junior colleges are divided into two types: five-year junior colleges and two-year junior colleges, each of which has different admission requirements. Five-year junior colleges recruit junior high school graduates, whereas senior vocational high school graduates are recruited by two-year junior colleges. The purpose of junior college education is to provide high-level professional manpower for the industry sector. Accordingly, junior college graduates in Taiwan have the minimum occupational and technical knowledge and skills necessary for job entry (Hu, 2007). The top level of the technical and vocational education track is a university of science and technology or an institute of technology, which offer undergraduate, master and doctoral degree programs. Both types of HTVE institutions contribute to cultivating students toward areas such as the engineering or technician level workforce. Undergraduate programs are two-year and four-year and institutions also offer in-service and continuing education.



Source: Taiwan Ministry of Education (2009a)

Figure 3-1 Technical and vocational education system of Taiwan

3.4 The historical development of Taiwan's HTVE sector

In the 1950s, the industrial structure in Taiwan was labour-intensive. At that time, technical and vocational education was focused on the enrolment of elementary-school graduates who met the needs of basic labour. In the late 1960s, with the transition from a labour-intensive to a skills-intensive industrial structure, technical and vocational education at the high-school level was fully developed, and some two-year junior colleges were established with the purpose of cultivating mid-level technical and management skills for the manufacturing industry. In the early 1970s, Taiwan entered a capital-intensive phase and there was an urgent demand for individuals with well developed managerial and leadership skills. The first university-level institution for the technical and vocational education system, the National Taiwan Institute of Technology (NTIT), was established in 1974 in order to provide further education opportunities to vocational high school and junior college graduates. Subsequently, master and doctoral

degree programs were connected and this provided a more complete technical and vocational education system in Taiwan (Department of Technological and Vocational Education, 2008).

During the 1990s, the rapid development of information technology gradually led to replacement of the traditional production models of labour and capital intensiveness, and transformed the traditional models of learning and working. With the emergence of a knowledge-based economy, the demands for high-level manpower became even more urgent. Students had high expectations of educational improvement. A survey revealed that about 70% of vocational school students preferred to continue their studies rather than find a job after graduation (Tien, 1996). The strong desire to pursue advanced education led the Taiwan Ministry of Education (hereafter MOE) to revamp its plans for vocational education in the mid-1990s (Tien, 1996). The Taiwan MOE, from the 1996 academic year onward, actively assisted those well-managed junior colleges on their way towards promotion to the level of institutes of technology, encouraged universities to establish the two-year institute of technology, and allowed institutes of technology to be renamed as universities of technology. Consequently, since 1999, there has been a notable rise in the number of junior colleges, institutes of technology, and universities of technology in Taiwan, growing from seven institutes of technology and 74 junior colleges in the 1995 academic year to 35 universities of technology, 42 institutes of technology, and 16 junior colleges in the 2006 academic year (Department of Technological and Vocational Education, 2009a). The expansion of vocational and technical education was a consequence of government policy (Tien, 1996). The outcome of Taiwan's HTVE market expansion is that it now offers a wide variety of study opportunities for students, while at the same time increasing competition in freshmen recruitment (Chang et al., 2005).

In contrast to the sharp increase in the number of HTVE institutions that have been upgraded from a lower level and the numbers of students that have enrolled, the birth rate in Taiwan, and hence the number of students studying in vocational high schools, is on a steady decline. Since the system of comprehensive high schools was introduced in the 1996 academic year, there have been over 143 vocational high schools that have adopted the system and have been transformed into comprehensive high schools (Department of Technological and Vocational Education, 2008). So, while the number

of HTVE institutions has continued to increase, the number of vocational high schools is in decline. Due to marriage at an older age, a high rate of divorce, and the rising cost of raising children, Taiwan society is now experiencing a declining birth rate. The birth rate during the period 1998-2005 decreased from 12.43 to 9.1 per thousand inhabitants, the lowest level since recording such data began in Taiwan (Taiwan Ministry of the Interior, 2009). According to the 2009 statistics from the Taiwan MOE (2009b), the number of vocational school graduates has decreased by 33% from 493,055 in the year 1998 to 331,604 in the year 2005. With the decline in the potential student population, the competition faced by Taiwan's HTVE market is therefore expected to increase.

Furthermore, with the entry of Taiwan into the membership of the WTO in 2002, the HTVE market encounters increased global pressure and Taiwan is required now to develop its manpower in accordance with international standards.

In these circumstances, every student has more opportunity to choose an educational institution best suited to his or her future benefits and career planning. The difficult task for HTVE institutions is to devise strategies to compete against foreign institutions. The success of this will impact on the future prospects of Taiwan's HTVE institutions.

In summary, this information indicates that competition among HTVE institutions is likely to increase as a result of four factors: (i) the HTVE market has become saturated, due to the emergence of many new schools that have upgraded from a lower level; (ii) the number of institutes and universities of technology is increasing whereas the number of junior colleges is decreasing; (iii) after its entry into the WTO in 2002, Taiwan has to open its educational market to foreign schools; students are provided with more opportunities to select a school in which they would most like to study; and (iv) the trend towards fewer children and the transformation of vocational high schools into comprehensive high schools is likely to cause a decrease in the number of graduates from vocational high schools. The phenomenon of unbalanced supply and demand is the likely outcome.

To cope with these challenges and to achieve a superior competitive position, HTVE institutions that are better equipped to respond to market requirements and are prepared to make continued improvements in the efficiency and performance of their institution's

operations, are expected to have competitive advantage and achieve long-term sustainability. This suggests the need for further investigation of the factors that are critical to the further development of Taiwan's HTVE sector, namely structural changes.

3.5 Structural changes in Taiwan's HTVE sector

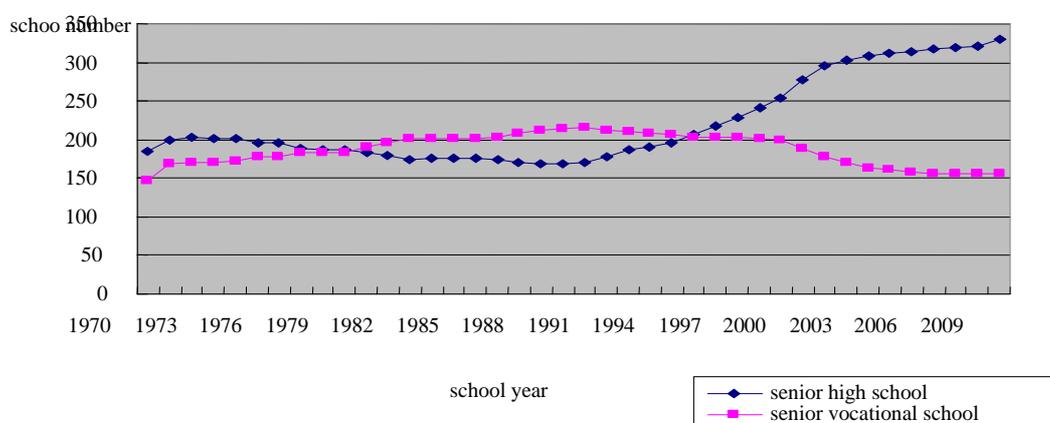
Technical and vocational education has long been positioned as 'terminal education' and its purpose has been to ensure that students can acquire certain entry-level skills and gain employment directly after graduation. Traditionally, students graduating from senior vocational schools were encouraged to enter the labour market rather than pursue further education. The majority of graduates could obtain good jobs in their related fields of interest. The traditional assumptions towards technical and vocational education are: a cure for youth unemployment; an alternative educational choice for students who are less academically able; and an attempt to reduce overall unemployment and poverty (Oketch, 2007). However, since 1995, with the changes in Taiwan's higher education policies, technical and vocational education is no longer regarded as terminal education. Most senior vocational school students are eager to access higher education (Hu, 2007). Furthermore, junior high school students are now favouring senior high schools rather than choosing senior vocational schools or junior colleges in which to study (Hu, 2007). The changes in the HTVE sector can be discussed from three different perspectives: the changes in the numbers of senior vocational high schools and senior high schools; the changes in the numbers of three types of HTVE institutions; and the changes in the number of students enrolled in HTVE.

3.5.1 Comparison of numbers of senior vocational high schools and senior high schools

Records indicate that the ratio of senior high schools to senior vocational schools was maintained at a constant ratio of 6:4 in the 1970s (Taiwan MOE, 2009b). However, between 1980 and 1995, there was an urgent demand for skilled workers in the rapidly growing economy of Taiwan. Under this situation, vocational education was preferable and the number of senior vocational high schools increased. Conversely, the number of senior high schools decreased gradually. By 1995, the ratio of senior high schools to senior vocational schools was almost 1:1. After 1996, when high-quality professionals were in high demand, Taiwan's educational policies were reversed, resulting in the

decreasing number of senior vocational schools and increasing number of senior high schools.

Figure 3-2 demonstrates the change in the number of senior high schools and vocational schools. Under the current educational system, the majority of students prefer senior high to senior vocational schools and pursue their further studies in academic universities rather than in HTVE institutions. From the viewpoint of Taiwanese students, technical and vocational education is considered to be less desirable (Hu, 2007).



Source: Taiwan Ministry of Education (2009b)

Figure 3-2 Change in number of senior high schools and vocational schools

3.5.2 Comparison between three types of HTVE institutions

In response to the needs of a high-skills labour force, the educational authorities decided to raise the level of HTVE institutions with a view to providing more competitive and comprehensive education and training for the public. Junior colleges were encouraged to upgrade to institutes of technology, even into universities of technology, in order to create unimpeded access to technical and vocational education. The number of HTVE institutions increased from 80 in 1996 to 93 in 2009, of which 44% were universities of science and technology, institutes of technology made up 40%, and junior colleges comprised only 16% (Department of Technological and Vocational Education, 2009a). The details of the change in the number of HTVE institutions are illustrated in Table 3-1.

Table 3-1 Change in number of HTVE institutions in Taiwan

School year	University of technology (n)	Institute of technology (n)	Junior college (n)	Total (n)
1996	0	10	70	80
1997	5	15	61	81
1998	6	20	53	79
1999	7	40	36	83
2000	11	51	23	85
2001	12	55	19	86
2002	15	56	15	86
2003	20	53	15	88
2004	22	53	14	86
2005	29	46	17	88
2006	32	45	16	89
2007	37	42	16	92
2008	38	41	16	93
2009	41	37	15	93

Source: Department of Technological and Vocational Education (2009a)

◆ Junior colleges

The major development phase of junior colleges was from the 1960s to the mid-1970s. This was also a period of vigorous growth in Taiwan's economy, when the structure of the economy began to change from labour-intensive industries to capital- and technology-intensive industries. To cope with the transformation of the economic growth pattern, the educational authorities viewed technical and vocational education as an economic investment and established various types of junior colleges (Huang, 2004). There were three junior colleges in Taiwan in 1950, but that number had increased to 74 by 1995 (Department of Technological & Vocational Education, cited in Chang et al., 2005). However, the number of junior colleges has dropped substantially since 1996. Many junior colleges have been upgraded to either institutes of technology or universities of technology as the educational authorities attempted to increase access to four-year programs. The outcome of this process was that there was a reduced number of junior colleges in Taiwan into the 2000s (refer to Table 3-1).

◆ Institutes of technology

The first institute of technology, the National Taiwan Institute of Technology¹, was established in order to provide further education opportunities to graduates of senior vocational high schools and junior colleges. Its establishment extended the scope of HTVE to the higher education level and helped form the technical and vocational

¹ It has now been upgraded to university of technology and been renamed as National Taiwan University of Science and Technology.

education system of senior vocational school, junior school and institute of technology phases. But for a long period after the first establishment, there was only one institute of technology in Taiwan. During the 1990s, the number of institutes of technology increased substantially each year. Some of the more prestigious junior colleges were upgraded to institutes of technology and others have been newly established. In recent years, there has been a slight decrease in the number of institutes of technology owing to the upgrading of some institutes into universities of technology.

◆ Universities of technology

In the late 1990s, several junior colleges were encouraged to upgrade to universities of technology. This was instigated in order to further improve the quality of technical and vocational education and to meet the desire of vocational high school graduates wishing to receive further education opportunities in technical and vocational education. This strategy was also designed to meet the demands for senior personnel that were required as manpower for the developing economy (Huang, 2004). Huang (2004) noted that human resources with better scientific and technological knowledge are fundamental to promoting and maintaining sustainable economic growth. Based on this consideration, the educational authorities began reforming the vocational education system, upgraded some institutes of technology to universities of technology, and established some other new ones. As shown in Table 3-1, none of Taiwan's universities of technology existed before 1997. In that year, five institutes of technology were upgraded to universities and the number gradually increased each year. By 2006, there were approximately 35 universities of technology located in different parts of the island.

3.5.3 Change in the number of freshman students enrolled at HTVE level

Table 3-2 indicates the change in the number of freshman students enrolled in different types of degrees offered by HTVE institutions from 2004 to 2008. It is clear that the number of students enrolled in HTVE decreased sharply, while the number of vacant places reached a record high. The statistics imply that HTVE institutions will experience recruitment difficulties in light of their low enrolment and vacancy rates. On the other hand, students graduating from senior vocational schools could have easier access to further education than ever before.

Table 3-2 Change in number of students enrolled in HTVE level

School year	Recruitment target (person)	Freshman students enrolled (person)	Enrolment rate (%)	Vacant places (person)	Vacancy rate (%)
2004	379,454	318,983	84.06	60,471	15.94
2005	370,481	315,918	85.27	54,563	14.73
2006	367,140	310,408	84.55	56,732	15.45
2007	358,405	299,231	83.49	59,174	16.51
2008	349,053	289,638	82.98	59,415	17.02

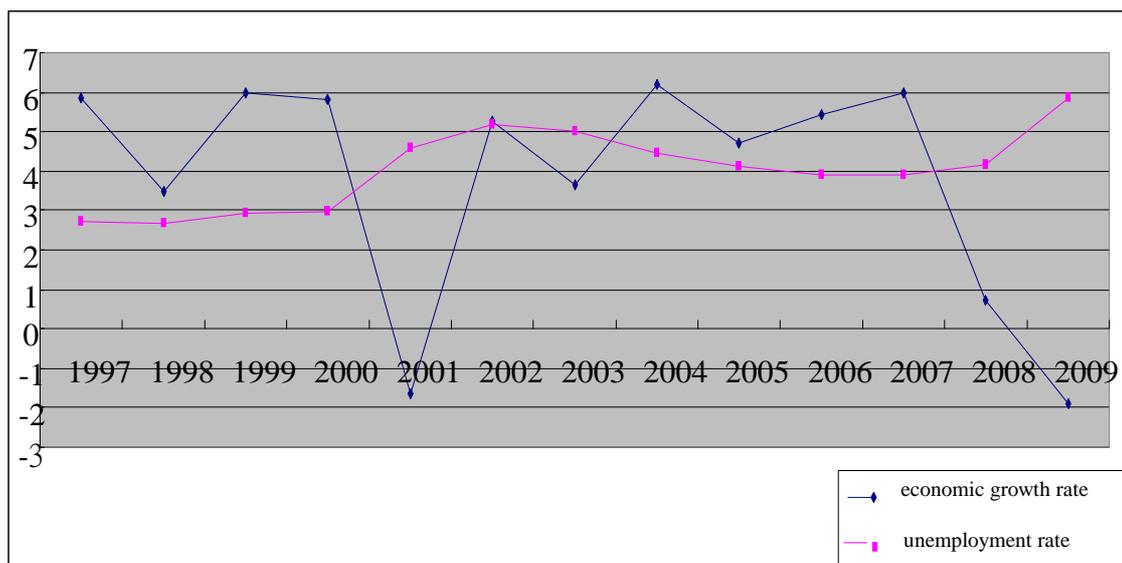
Source: Department of Statistics, Taiwan Ministry of Education (2009).

3.6 External environment analysis of Taiwan's HTVE sector

As discussed in the previous sections, the HTVE sector has experienced significant structural changes in recent years. An external environment analysis of Taiwan's HTVE sector at both macro and micro levels could provide senior managers of HTVE institutions with useful suggestions relating to the achievement and sustainability of competitive advantage.

3.6.1 Macro environment analysis

Taiwan's economy slowed down after the year 2000 and the unemployment rate grew gradually, as shown in Figure 3-3. Under this situation, it might be more difficult for HTVE graduates to find suitable employment and to compete in this competitive job market. Moreover, after Taiwan's entry into the WTO in 2002, it is required to open its education market to foreign educational institutions. Foreign educational institutions are allowed to come to Taiwan to recruit students, causing an exodus of the student population above 18 years of age to studying abroad (Huang, 2003; Chang et al., 2005).



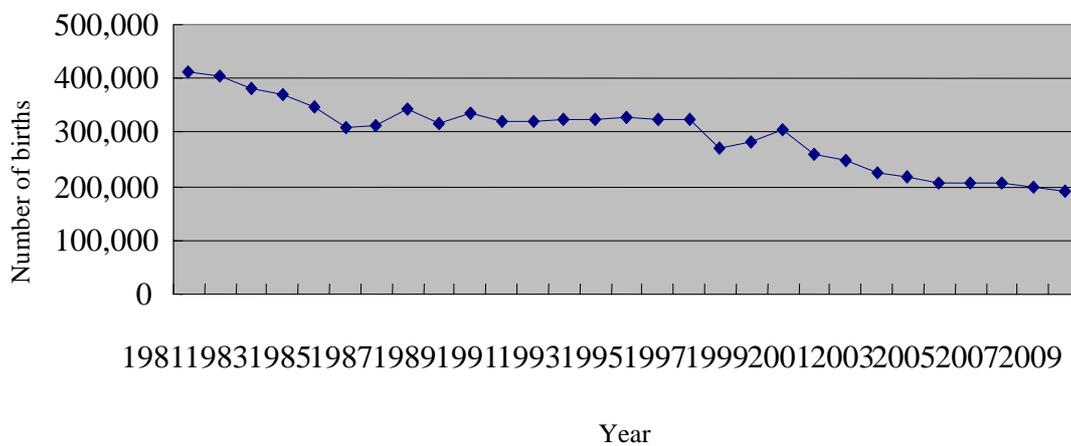
Source: The Directorate General of Budget Accounting and Statistics, Executive Yuan, Taiwan (2009a, b).

Figure 3-3 Change in Taiwan’s economic growth rate and unemployment rate

Special attention should also be paid to the individual influence of three socio-cultural factors on the future development of HTVE sector, namely: the negative image of technical and vocational education; the low birth rate; and the ageing population. Firstly, technical and vocational education in Taiwan has long been considered an educational option only for the non-college bound students (i.e. those unable to deal with the rigors of a traditional four-year college education), potential dropout students, or students with special needs. It is associated with blue-collar industries such as plumbing, construction, and auto mechanics (Stone, 1993; Catri, 1998). In Taiwan, technical and vocational education is often regarded as an inferior option (Liu, 2004) and the negative attitudes toward technical and vocational education may lead both parents and students to choose general high education. Outstanding students usually select comprehensive universities and colleges for their higher education.

Secondly, the number of births in Taiwan has been decreasing for decades, as shown in Figure 3-4. The decrease in the number of births per annum means that in the forthcoming decades, Taiwan’s population will be skewed towards an older generation. According to Yung and Hsu (2006), between 2005 and 2015, Taiwan’s workforce comprising those aged 50-64 will increase by 4.7 percent per year and the number of

those 65 years or older by 6.5 percent. The middle- and higher-aged groups will become a major force in the labour market. Although the ageing population may slow economic growth, it provides the greatest opportunity for the HTVE sector to grow and expand. HTVE institutions are encouraged to offer programs of continuing technical and vocational education using flexible teaching methods to re-educate those employed and seeking employment in a lifelong learning society (Yung & Hsu, 2006).



Source: Taiwan Ministry of the Interior (2009)

Figure 3-4 Change in number of births

Moreover, the rapid developments in information technology have revolutionized the traditional teaching environment and have changed the content and methods of teaching and learning. The concept of distance learning was generated from the fusion of information and communication network technology. Such technology provides students with greater flexibility in relation to when and how they learn. From the viewpoint of education institutions, the implementation of long distance learning breaks down the traditional geographic barriers and extends curriculum offerings that might not be accessible to students (Chen, 1998). Distance learning also makes it possible for students to take courses offered outside of their country of residence. Many international educational institutions can be accessed through distance learning by which students can earn a degree. This represents a potential threat to existing HTVE institutions.

Finally, the Taiwan MOE has exerted great influence over policies and regulations to ensure the overall quality of HTVE institutions. For example, through the amendment of the *Junior College School Act*, junior colleges could be recognized as institutes of technology, enabling a closer connection between various systems. The *Auditing Regulation for Institute of Technology to Rename to University of Technology* was proclaimed to permit institutes of technology to rename their institutions as universities of technology. The Taiwan MOE has developed execution guidelines for the purpose of periodic assessment of junior colleges, institutes and university of technology. The purpose of this assessment is to assist the institutions in discovering problems, supervise their improvement and provide recommendations in order to increase their performance. Since 1993, the Taiwan MOE has been conducting integrated evaluations every four years on all junior colleges, institutes and universities of technology. Five aspects are evaluated, including educational goals, instructors, curriculum, equipment and administration. The results of the accreditation are the primary criteria for the Taiwan MOE to approve tuition and fee adjustments, adjustments of classes, as well as the subsidization and research funds for these institutions (Department of Technological and Vocational Education, 2009b).

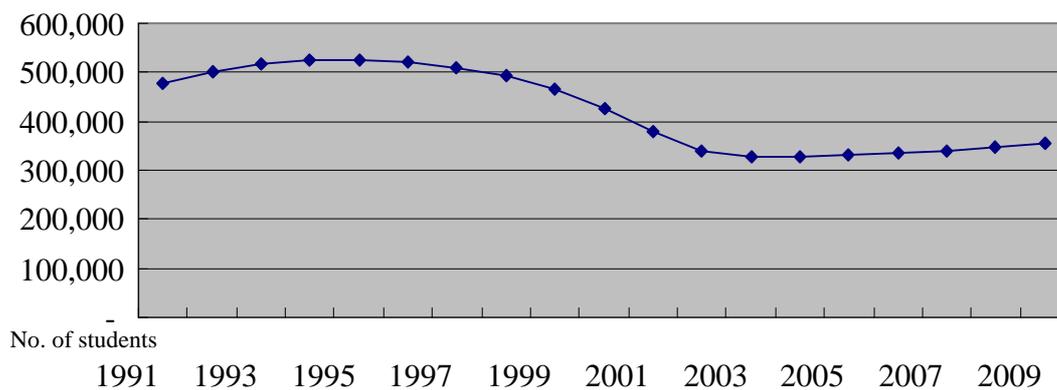
3.6.2 Micro environment analysis

As identified in Table 3-1 (page 41), there are 93 HTVE institutions in Taiwan, of which 41 are universities of science and technology, 37 are institutes of technology, and 15 are junior colleges (Department of Technological and Vocational Education, 2009a). These are the key players in the sector and are competing with each other for a decreasing pool of students. With the dynamic changes in the macro environment, it is anticipated that the competition among them will become fiercer in the future. This can be discussed from different perspectives.

Firstly, foreign universities are now allowed to come to Taiwan to recruit students. They are likely to intensify their public relations and recruitment activities, both in targeting the student population above 18 years of age and attracting students with distance learning courses (Huang, 2003). These foreign educational institutions have sufficient capital resources and abundant international management experience. They can also build branch campuses in Taiwan, competing with local educational institutions for the shrinking student pool.

Secondly, teaching staff are regarded as the main suppliers/providers of educational services in the HTVE sector. However, while the majority of faculty and teaching staff in the HTVE sector have solid academic backgrounds, excellent research abilities and abundant research experiences, they lack the necessary practical experiences and have limited knowledge of the actual demands of industry. It has been suggested that to strengthen the workplace experience of faculty and teaching staff, HTVE institutions should establish favourable employment mechanisms to enable faculty teaching staff to gain practical industry experience. This is likely to attract those who have worked in industry and who have the practical experiences necessary to fulfil the fundamental objectives of technical and vocational education (Tseng, Chang & Kuo, 2009).

Finally, senior vocational school graduates are the main market for HTVE institutions. However, the number of students enrolled in senior vocational schools has decreased every year, as shown in Figure 3-5. As such, competition between HTVE institutions has intensified as they seek to attract a smaller pool of students. This may be harmful to those HTVE institutions with a lower ranking, as they may be eliminated from the competition. To maintain and even to strengthen their competitive position in the HTVE market, HTVE institutions need to actively seek to improve the quality of education content and delivery in order to attract outstanding students from across the nation (Tseng et al., 2009).



Source: Taiwan Ministry of Education (2009c).

Figure 3-5 Change in number of senior vocational school students

3.7 Summary

The historical development and current situation of Taiwan's HTVE sector illustrates significant changes in market supply and demand. This provides the rationale for developing a model of competitive advantage for HTVE institutions in Taiwan. The following chapter presents the conceptual framework developed to guide the research and the proposed hypotheses within the research context - Taiwan's HTVE sector.

CHAPTER 4: CONCEPTUAL FRAMEWORK

4.1 Introduction

In the previous chapters the context of this study and the theoretical lenses that will be used to examine the research problem have been presented. The purpose of this chapter is to propose an integrated model of competitive advantage incorporating findings of the literature review. In order for a model of competitive advantage to be developed for the HTVE sector, a series of hypotheses are also developed based on anticipated relationships between external industry structure, internal resources, and strategy types with institutional performance.

4.2 Application of IO and RBV theories to the context of educational institutions

The initial stage of a school self-management process is environmental analysis, in which the school as a whole reflects on the external and internal environments relevant and crucial to its existence in terms of strengths, weaknesses, opportunities, and threats (Cheung & Cheng, 1996). A school's external environment is composed of such factors as the social, political, economic, cultural and technological development of society; competition from other schools; expectations of parents and members of the community; potential student population in the district; educational innovations; and the central educational authority's direction in providing education services. The school also analyzes its internal environment in terms of such factors as human resources, financial resources, physical resources, student intake, school climate, and its various education programs (Cheung & Cheng, 1996). The application of strategic management to the context of educational institutions is feasible based on two premises: (i) an institution of higher education is an entity with its own goals and coherent, goal-directed actions; (ii) an institution of higher education is a network of participants who use their association to pursue their individual goals (Chaffee, 1984; McAleer & McHugh, 1994).

As can be seen from the literature review in Chapter 2 (Amit & Schoemaker, 1993; Foss, 1996; Conner, 1991; Hoskisson et al., 1999; Spanos and Lioukas, 2001), it has been increasingly recognized that the IO and the RBV perspectives may complement each other in the development of strategies for achieving competitive advantage. The IO adopts an external perspective to explain that industry structure outside of the firm represents the dominate influence on a firm's strategy and performance. The RBV

adopts an internal perspective to explain how a firm’s unique internal resources serve as a basis for its strategy and performance. With a view to remaining in step with the current literature, the proposed conceptual framework integrating IO and RBV theories of competitive advantage, with Miles and Snow’s (1978) typology of strategy is presented in Figure 4-1. The relationship between the external industry structure within which HTVE institutions operate and the types of strategy they formulate to achieve competitive advantage will be understood through the application of IO theory, specifically using Porter’s (1980) five-force model of competition. The relationship between the internal resources and the strategy types HTVE institutions use to achieve competitive advantage will be understood through the application of RBV theory, particularly the studies of Hofer & Schendel (1978), Snow & Hrebiniak (1980), Barney (1991), and Verona (1999). Finally, the relationship between strategy types and institutional performance will be examined using the Miles and Snow (1978) typology.

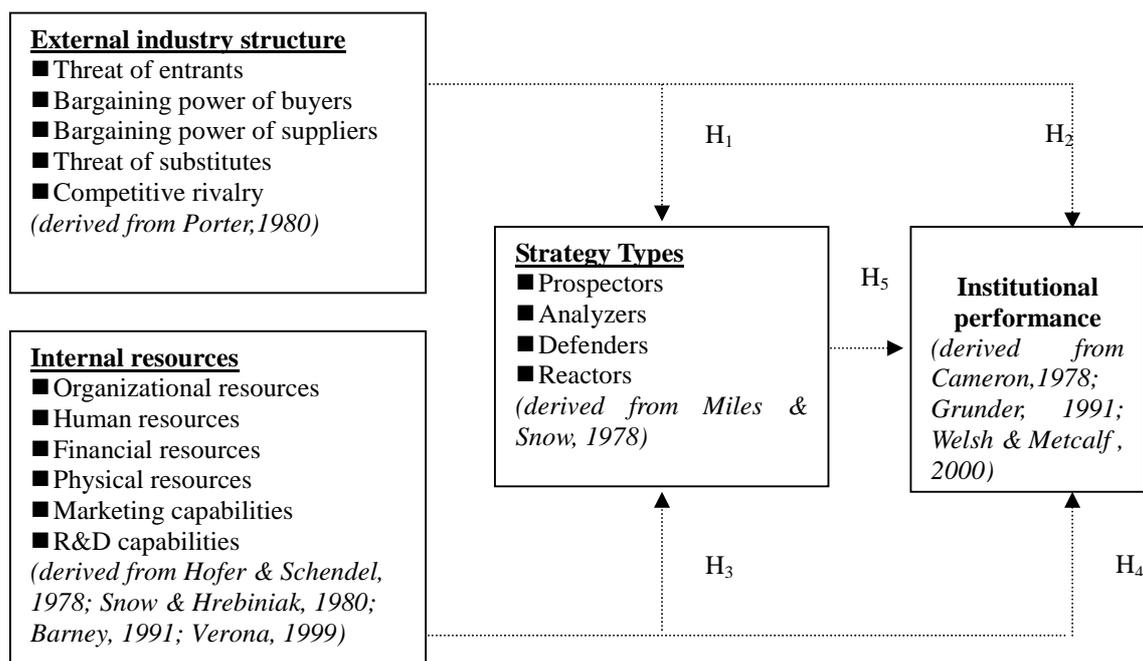


Figure 4-1 The integrated model of competitive advantage

An underlying assumption of the proposed conceptual framework is that the competitive advantage of HTVE institutions could be achieved through the formulation and implementation of a competitive strategy that matches its internal resources against the external industry environment. The process of combining internal and external

examinations of HTVE institutions may produce insights and understandings to identify the strengths and opportunities that could contribute to achieving competitive advantage and gaining superior institutional performance, as well as the weaknesses and threats that need to be countered or avoided. The following section discusses the development of the hypotheses.

4.3 Development of hypotheses

4.3.1 Relationship between external industry structure and strategy types

Firms must fit their strategies to their industry environments. The pursuit of strategies that do not fit the industry structure is likely to lead to market divestments and withdrawals (Benito, 2005). According to Porter, “an effective competitive strategy takes offensive or defensive action in order to create a defensible position against the five competitive forces” (1980, p.29). The five forces determine the nature of competitive rules and a firm’s strategic choices (Porter, 1980). However, external environmental factors change and evolve over time. Therefore, firms and their strategies must be flexible and responsive to more and more uncertainty, especially generated by rapid advances in technology (Miles & Snow, 1978).

Miles and Snow (1978) have illustrated the link between a firm’s strategy and the external environment in which it operates. Firms are more likely to adopt a Prospector strategy if they perceive their operating environment to be more dynamic and unpredictable, with a need to be flexible in order to compete in the market (Namiki, 1989; Parnell & Wright, 1993). They are the most flexible and “almost continually search for market opportunities, and they regularly experiment with potential responses to emerging environmental trends” (Miles & Snow, 1978, p.29). Prospectors are the first movers, responding actively and flexibly to market signals, and these responses, in turn, lead to their competitive advantage (Walker, Boyd, Mullins & Larreche, 2003). The more complex and turbulent the external environment is, the more prospecting a firm’s strategic orientation is. They take full advantage of the emerging opportunities arising from the turbulence in the industry.

Defenders, on the other hand, perceive their environment to be stable and certain, and “enact the environment of greater stability than do their counterparts” (Miles & Snow, 1978, p.47). Defenders are the least flexible. They seek a stable and narrow niche in the

total potential market by producing a limited set of products directed at this segment of the market (Miles & Snow, 1978). In addition, Defenders have no interest in being at the forefront of their industry and tend to ignore industry changes not directly related to their areas of operation (Walker et al., 2003). If a firm perceives its environment to be more stable and certain, their strategy is likely to be that of a Defender.

Analyzers can operate equally well in predictable and changing environments. They seek stability as well as flexibility. In the stable environment, Analyzers operate as routinely and efficiently as they possibly can in order to secure a stable market position within a core market. In the changing environment, Analyzers “watch their competitors closely for new ideas, and ... rapidly adopt those which appear to be most promising” (Miles & Snow, 1978, p.29). Although they are seldom a first mover, they are often a second or third entrant in their existing market base (Walker et al., 2003). In this sense, Analyzers do not perceive their environment as very stable and certain, or as very unstable and uncertain. They perceive the environment as somewhere in the middle.

Reactors have no consistent strategy and only respond when forced to do so (Miles & Snow, 1978, p.29). They prefer stable and predictable environments, because they are unwilling to presume risk factors in new product or market development processes and to be aggressive in marketing established products (Walker et al., 2003). Thus, a firm with a lower level of perceived environmental uncertainty is more likely to adopt a Reactor strategy.

The preceding discussion suggests that that the external environment is a significant influence on strategy formulation and implementation. The strategy must be aligned with the external environment in which a firm operates. The aim of strategy is to assist firms in finding ways to effectively defend against the competitive forces or to exert its influence on these competitive forces. The strongest force or forces govern and determine the choice of strategy. Firms therefore need to be aware of the relative impact of each of the five forces on their industry structure. They can then ascertain their ability to influence the forces with the greatest impact on their industry structure through their strategy formulation and implementation (Porter, 1980). As such, **Hypothesis One** is:

HTVE institutions that adopt different types of strategy have significantly different perceptions of their external industry structure.

Different perceptions of Taiwan's HTVE sector may lead to the selection of different strategies. For example, HTVE institutions attempting to upgrade themselves from junior colleges to institutes of technology or from institutes to universities of technology may formulate and implement an aggressive strategy in response to the dynamic competitive environment. In contrast, HTVE institutions that have previously developed the highest reputations as niche suppliers of a specific academic product would perceive the external environment as more stable and predictable, thus formulating and implementing a more conservative strategy.

4.3.2 Relationship between external industry structure and institutional performance

A review of the literature suggests that firms need to focus on the external environment, on the attributes of external forces, and on managerial perceptions about these external attributes. This should be recognized as a significant causal element in the strategy and organizational performance nexus (Bourgeois, 1985; Swamidass & Newell, 1987). According to Porter (1980, 1990 & 1991), competition intensity varies from industry to industry, as do opportunities for sustained profitability. Intensity of competition and potential profitability of an industry depends on the collective strength of the five competitive forces. The stronger these forces are in an industry, the lower profitability will be.

Afuash and Utterback (1997) demonstrated how the five forces determine firm performance by using Porter's (1980) five-force model of competition. The results of their study suggested that new entrants aggravate industry competition and therefore drive down profit margins. The availability of close substitutes makes it more difficult for a firm to raise its prices without driving customers to waiting substitutes. Powerful suppliers can increase costs while powerful customers can bargain away profit margins. Finally, rivalry among competitors results in the erosion of profit margins. Overall, the five competitive forces jointly erode the long-term profitability of an industry. The stronger the five competitive forces are in an industry, the lower profitability will be. This conclusion is consistent with Porter's (1980) assertion.

Ramaswamy and Renforth (1996) also examined the role of competitive intensity in influencing performance differentials between firms. The results indicated that if the intensity of competition in an industry is low, there will be very little difference in organizational performance. However, as competitive intensity increases, the performance differentials will become significant. It can be concluded therefore, that the nature of competitive intensity significantly influences organizational performance. Dorling, Scott and Deakins (2006) examined the relationship between industry environment and organizational performance using Porter's (1980) five-force model of competition. Their findings supported the notion that as the power of five forces increases, this tends to limit the ability of firms to boost profitability.

The preceding discussion highlights that a firm's profitability depends in part on the structure of the industry in which it operates (Porter, 1980; Ramaswamy & Renforth, 1996; Afusah & Utterback, 1997; Dorling et al., 2006). The industry structure residing in five competitive forces may either facilitate or inhibit organizational performance. As such, **Hypothesis Two** is:

External industry structure will positively affect institutional performance.

In this sense, the performance of HTVE institutions is related to the competitive intensity of Taiwan's HTVE sector - the higher the intensity of that competition, the less opportunity it provides, and the more HTVE institutions are limited in their ability to earn greater profits and achieve superior performance.

4.3.3 Relationship between internal resources and strategy types

A firm is perceived as a unique set of resources, which is crucial for the execution of competitive strategies (Penrose, 1959; Grant, 1991). As such, a firm's resources are essential components that allow it to formulate and implement strategies that are appropriate to compete successfully in the context of the industry. In examining the relationship between a firm's resources and strategy, Benedetto and Song (2003) argued that different types of strategy should be related to different sets of firm resources. Certain sets of firm resources will be relatively more important depending on the type of strategy adopted.

Snow and Hrebiniak (1980) suggested that firms labelled as Prospectors, Analyzers, and Defenders should have distinctive patterns of resources. For example, Prospectors are likely to be competent at market research, R&D, and basic engineering, while Defenders' competent functions are production, applied engineering and financial management. Reactors, they claimed, have no consistent pattern of distinct resources. Different patterns can lead to the choice of different types of strategy.

Hambrick (1983) contended that Defenders and Reactors are unlikely to search outside their domains for new opportunities, and rarely make commitment to any R&D. Prospectors, on the other hand, heavily emphasize innovativeness and invest largely in R&D. Analyzers invest in R&D only in core technology and business.

Miles and Snow (1984) studied the differences between their four strategy types in relation to the management of human resources. They found that Defenders usually have less developed systems of human resource management, because they use recruitment and internal selection. The compensation system corresponds to a fixed salary structure and there is no employee performance appraisal system. However, they attach higher importance to long-term training. In contrast, Prospectors have more developed human resource management systems, because they resort to recruitment and external selection. An employee evaluation system is based on performance, and reward is based on the variable compensation. However, they offer limited and informal training.

Conant et al. (1990) analyzed the relationships between strategy types, distinctive marketing competences and organizational performance. Their findings demonstrated that Prospectors present superior marketing competencies in exploring new product and market opportunities compared to other strategy types. Defenders have relatively weak marketing competencies and Reactors have weak marketing competencies.

Harold, Glick and Huber (1993) found that there are significant differences in organizational structure and design across Miles and Snow's (1978) four types of strategy. Defenders often adopt formalized and centralized structure and seldom need to make major adjustments. Prospectors often adopt a decentralized and more flexible structure and will adjust to accommodate product and market innovation. Analyzers

operate routinely and efficiently through the use of formalized structures and processes only in their stable areas. They may adjust their structure when they are faced with turbulence. Reactors lack a consistent strategy-structure relationship. They seldom make new adjustments until forced to do so by environmental pressures.

Borch, Huse, and Senneseth (1999) explored the relationships between resource configurations and entrepreneurial strategy. They found that financial resources determine the ability of the firm to “finance” its chosen strategy. Prospectors that require significant investment in new products, distribution channels, production capacity and working capital place great emphasis on the availability of financial resources. Analyzers accumulate rich financial resources during their development to provide better product and search for growth. Defenders and Reactors often lack financial resources and avoid undertaking growth and risk-taking strategies.

Camelo-Ordaz, Martin-Alcazar and Valle-Cabrera (2003) found that Prospectors tend to value the resources that enable innovation. Analyzers, however, tend to possess resources that strengthen both efficiency and market/product development. Defenders tend to focus their resource strategy on specification and efficiency. They concluded, therefore, that it is important that the type of strategy a firm employs should be linked to its bundle of resources.

Defenders compete with physical assets as their core resources (Sidhu, Volberda & Commandeur, 2004). They invest in physical assets and associated fixed costs to raise barriers to entry and to deter new competitors. Prospectors and Analyzers do not look on physical resources as their core resources, but they do invest highly in such resources, in penetrating new product and market domains.

The preceding discussion suggests that the formulation and implementation of strategy should be linked to the unique resources of a firm. A firm requires a wide range of resources to be employed to achieve competitive advantage. The emphasis given to the types of resources varies across Miles and Snow’s four types of strategy. Certain resources and capabilities will be relatively more important to the respective types of the strategy (Snow & Hrebiniak, 1980; Benedetto & Song, 2003). As such, **Hypothesis Three** is:

HTVE institutions adopt different types of strategy based on the combinations of resources that they have.

Different combinations of resources within HTVE institutions have led to the selection of different strategies. For example, public HTVE institutions with abundant resources and capabilities should adopt a more active stance to strategy formulation and implementation, whereas private HTVE institutions with limited resources and capabilities should take a more proactive approach to strategy formulation and implementation.

4.3.4 Relationship between internal resources and institutional performance

The RBV theory views each firm as a collection of unique resources that provide the basic foundation for strategy formulation and implementation, which in turn lead to differences in firm performance (Wernerfelt, 1984; Hitt, Ireland & Hoskisson, 2001). Since resources are heterogeneous in nature, firms that make greater use of their resources and capabilities are likely to gain competitive advantage and enjoy superior performance (Hofer & Schendel, 1978; Barney, 1991).

In investigating the relationship between organizational structure and design and organizational performance, DeCanio, Dibble and Amir-Atefi (2000) indicated that a failure to recognize the importance of organizational structure and design on firm performance will lead to serious bias in estimation of the costs or benefits of a change in external circumstances. The authors contended that organizational structure and design will definitely have an effect on firm profitability and productivity. However, they argued that it is hard to say that there is a clear negative or positive relationship between organizational structure and design and firm performance.

The study of Hitt et al. (2001) examined the moderating effects of human resources on firm performance. The results suggested that human resources exhibit a curvilinear (U-shaped) effect and the leveraging of human resources has a positive effect on firm performance. Furthermore, the results suggested that human resources moderate the relationship between strategy and firm performance, thereby supporting a resource-strategy contingency fit.

A substantial amount of empirical research has documented a positive relationship between financial resources and a firm's long-term growth (Russo & Fouts, 1997; Chandler & Hanks, 1998). Young firms well endowed with financial capital during their development period enjoy many advantages and thus can perform better; they can invest more in R&D and marketing, recruit valuable human capital, and enjoy higher performance compared with rivals (Lee, Lee & Pennings, 2001).

Carballeira and Galand (1980) noted that the investment of physical resources not only contributes to the large amount of output, but also increases the market value of their products, which in turn achieves high performance. Russo and Fouts (1997) examined the relationship between physical resources and organizational performance. The results suggested that the available quantity of physical resources would facilitate the distribution system and improve the power of operation systems, thus allowing a further increase of productivity.

Appiah-Adu, Fyall and Singh (2001) claimed that marketing capabilities are significantly and positively associated with organizational performance. Fahy, Hooley, Cox, Beracs, Fonfara and Snoj (2000) examined the nature of marketing capabilities across a range of firm types. They found that firms with foreign participation are able to develop a sophisticated level of marketing capability with a resulting positive impact on firm performance. Pulendran, Speed and Widing (2003) examined the relationships between marketing planning, market orientation and firm performance. They explored how linking the behaviours of marketing planning with the values of market orientation can impact on organizational performance. Their findings suggested that high quality marketing planning capabilities can lead to superior performance.

Irwin & Klenow (1994) explained the reasons why R&D capability is critical for a firm to achieve a superior performance in dynamic environments. Firstly, a firm with a strong R&D capability enjoys strong consumer loyalty. Secondly, R&D has a significant learning-by-doing effect, which makes competitors extremely difficult to imitate. These characteristics of R&D capability enable a firm to achieve superior performance relative to its competition (Irwin & Klenow, 1994). Hall and Bagchi-Sen (2002) indicated that firms with higher levels of R&D capability are successful in obtaining superior performance. Sher and Yang (2004) investigated the impact of

various aspects of innovative capability on firm performance. The results indicated that R&D capabilities are positively related to organizational performance as measured by returns on assets (ROA). Specifically, higher R&D intensity and higher R&D manpower are predictors of firm performance.

The preceding discussion suggests that, if a firm has valuable, rare, non-substitutable and inimitable resources, it may have competitive advantage to enjoy superior performance (Barney, 1991). Varying performance between firms is a result of heterogeneity of resources. The more unique resources a firm has, the more robust they are and the less likely they are to be substituted and imitated. Ultimately, this would result in a higher level of performance for a firm. As such, **Hypothesis Four** is:

Internal resources will positively affect institutional performance.

The performance of HTVE institutions is likely to be influenced by the availability of unique resources albeit with varying degrees of significance. The more valuable, rare, non-substitutable and inimitable resources (e.g. reputation, school culture) HTVE institutions have, the higher the level of performance they are likely to achieve.

4.3.5 Relationship between strategy types and institutional performance

Organizational performance varies to some extent depending on how effectively and efficiently a firm formulates strategy (Miles & Snow, 1978; Davig, 1986; Smith et al., 1989; Conant et al., 1990; Saaty & Vargas, 1994; Andrews, Boyne & Walker, 2006). According to Miles and Snow (1978), Defenders, Analyzers and Prospectors are viable strategic types and equally likely to perform well, whereas Reactors perform poorly. A number of previous studies have confirmed this assertion.

For example, Conant et al. (1990) reported that Prospectors, Analyzers and Defenders performed equally well in terms of profitability and outperformed Reactors. Similarly, the study conducted by Smith et al. (1989) indicated that Prospectors, Analyzers and Defenders perform equally well in terms of profitability and are superior to Reactors.

Davig (1986) studied the four types of strategies undertaken by firms in mature, stable industries. The results indicated that Prospectors and Defenders are the best performers

in terms of growth in profits, while Reactors are the worst performers. Analyzers perform better than Reactors but worse than Prospectors and Defenders. Parnell and Wright (1993) addressed the relationship between strategy and performance in a rapidly growing and highly dynamic industry. The results confirmed the assumption that Reactors are outperformed by Prospectors, Analyzers and Defenders. Specifically, Prospectors are the best performers in terms of sales growth. Analyzers enjoy higher ROA than the other strategy types. Building on Miles and Snow's (1978) typology, Saaty and Vargas (1994, pp.57-59) illustrated that a more 'outside-oriented' strategy (i.e. Prospector) tends to produce better financial and market results compared to a more 'inside-oriented' strategy (i.e. Defender).

Firms should clearly define their strategic orientation, and improve strategy alignment in order to achieve superior performance. Andrews et al. (2006) tested the proposition that strategic stance is a key determinant of organizational performance in the non-profit sector. The results indicated that organizational performance was positively related to a Prospector stance and negatively related to a Reactor stance. Jennings, Rajaratnam and Barry (2003) analyzed the strategy-performance relationships in service firms. The results indicated that there is no significant difference in organizational performance between Prospector, Defender, or Analyzer strategy. Organizations with a Prospector, Defender, or Analyzer strategy, however, had a higher level of performance than did those organizations with a Reactor strategy.

The preceding discussion suggests that firms differ in performance because of differentials in their strategies (Miles & Snow, 1978; Smith et al., 1989; Conant et al., 1990; Parnell & Wright, 1993). Prospectors, Defenders, Analyzers are likely to enhance organizational performance and share the continuum. Prospectors stand on one end of the continuum; Defenders on the other end; and Analyzers stand in the middle. A Reactor strategy is likely to impede organizational performance and is excluded from the continuum. As such, **Hypothesis Five** is:

Institutional performance differs based on the different types of strategy that HTVE institutions adopt.

The performance of HTVE institutions may vary significantly, depending on the types of strategy formulated and implemented. HTVE institutions with ambition and a willingness to respond quickly to competitor initiatives and changes in the external environment are likely to achieve above-average performance. Institutions with no ambition or willingness to make adjustments until forced to do so by environmental pressures, however, are likely to achieve below-average performance.

4.4 Summary

The purpose of this chapter was to conceptualize the relationships between external industry structure, internal resources, and strategy types with institutional performance in the research context - Taiwan's HTVE sector. Drawing from an extensive review of the literature, the anticipated relationships between external industry structure, internal resources, and strategy types with institutional performance were proposed and a model of competitive advantage was presented in Figure 4-1. The perceptions of external industry structure and the combinations of resources that HTVE institutions have are thought to vary according to the adoption of different types of strategy. In addition, the external industry structure that HTVE institutions operate within, their internal resources, and the types of strategy adopted, are likely to generate significant variance in performance outcomes. The hypotheses developed under the proposed conceptual framework were tested through a two-stage research approach which is described in detail in the next chapter.

CHAPTER 5: RESEARCH METHOD

5.1 Introduction

The purpose of this chapter is to describe the methods used to examine the conceptual framework. The structure of this chapter is presented in Figure 5-1. As can be seen, this chapter outlines the justification of the two-stage research approach and provides the details of the qualitative and the quantitative stages of the research.

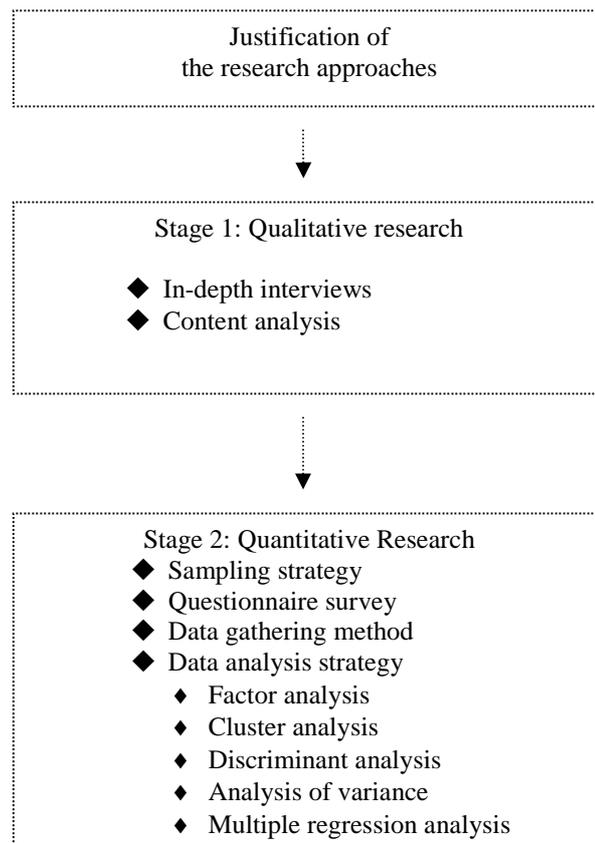


Figure 5-1 Structure of Chapter 5

5.2 Research paradigm

Table 5-1 illustrates a distinction in the methods used, that is, quantitative or qualitative; the underlying logic, that is, deductive or inductive; the epistemology or the separation between the knower and the known; the axiology or the role of values in the research;

the ontology or the perceived nature of reality; and the causal linkages being investigated.

Table 5-1 Comparisons of paradigms in social and behavioural sciences

	Positivism	Postpositivism	Pragmatism	Constructivism
Methods	Quantitative	Primarily Quantitative	Quantitative + Qualitative	Qualitative
Logic	Deductive	Primarily Deductive	Deductive + Inductive	Inductive
Epistemology (Relationship of the knower to the known)	Objective point of view; knower and known are dualism	Modified dualism Findings probably objectively “true”	Both objective and subjective points of view	Subjective point of view; knower and known are inseparable
Axiology (Role of values)	Inquiry is value free.	Inquiry involves values, but they may be controlled	Values play a large role in interpreting results	Inquiry is value bound
Ontology (Nature of reality)	Naïve realism	Critical or transcendental realism	Accept external reality; choose explanations that best produce the desired outcomes	Relativism
Casual linkages	Real causes , temporally precedent to or simultaneous with effects	There are some lawful, reasonably stable relationships among social phenomena that may be known imperfectly	There may be some causal relationships, but we will never be able to pin them down	All entities simultaneously shaping each other; it’s impossible to distinguish causes from effects

Source: Tashakkori & Teddlie (1998, p. 23)

As can be seen from Table 5-1, according to Tashakkori and Teddlie (1998), the quantitative approach tends to be related with the post-positivistic paradigm, employs strategies of inquiry such as experimentation and survey and methods of data collection that are pre-determined measures resulting in numeric data. By contrast the qualitative approach tends to be related with constructivist paradigms, employs strategies such as the case study or narrative and uses methods or data collection such as the interview resulting in open ended textual data. The mixed methods approach related with the pragmatic paradigm employs strategies of inquiry that involve collecting data either simultaneously or sequentially to best understand the research problem.

For the purposes of this study, a pragmatic paradigm was adopted based on the following reasons: (i) its ability to answer both qualitative and quantitative research questions that other paradigms cannot; (ii) it provides stronger inferences through depth and breadth in answer to complex social phenomena; (iii) it provides the opportunity through divergent findings for an expression of differing viewpoints (Tashakkori & Teddlie, 1998).

5.3 Justification of the research approach

A two-stage approach to the research was adopted. The first stage of the research involved exploratory qualitative work, involving in-depth interviews with key informants involved in Taiwan's HTVE sector. The second stage involved a quantitative approach whereby a survey of senior managers of Taiwan's HTVE institutions was undertaken.

Tashakkori and Teddlie (2003) claimed that the two-stage research approach is superior for conducting academic studies because: (i) research questions can be dealt with effectively using the qualitative or quantitative approaches; (ii) it often helps scholars to generate and refine the research issues by adapting methodological approaches; and (iii) scholars are provided an opportunity to discuss and explain the results generated from different perspectives. Similarly, Neuman (2006) affirmed that using the two-stage research approach to conduct research provides scholars with a better understanding of their research questions. Qualitative research provides meaningful and detailed information about respondents' thoughts and feelings. Quantitative research is useful in providing a demonstration of the potential relationships between variables and a clearer picture of the research questions via statistical analysis.

In this study, a two-staged approach was used because: (i) the development of a model of competitive advantage for educational institutions has not been undertaken in Taiwan's HTVE context; and (ii) it was thought that a qualitative stage would assist in laying a foundation from which to identify the key issues for Taiwan's HTVE sector more broadly. Additionally, it was considered that a quantitative approach will help determine how to deal with these key issues via empirical analysis.

5.4 Stage one: qualitative research

The primary intention of the qualitative component of the research was to explore the elements and indicators of competitive advantage of HTVE institutions in Taiwan. The literature review suggested that the IO and RBV theories can be linked into an integrated framework of competitive advantage. As such, both external industry forces and internal organizational resources were explored. Qualitative research was, therefore, valuable in forming the basis for the subsequent quantitative stage of the research.

While previous studies have proposed a range of elements and indicators that are believed to influence and be used to evaluate the competitiveness of a particular industry sector, it seemed unlikely that all of these elements and indicators of competitive advantage would be applicable to Taiwan's HTVE sector. Therefore, any variables to be employed in the quantitative survey needed to be first explored through an analysis of qualitative data. According to Cavana, Delahaye, and Sekaran (2001), the strength of a qualitative approach is the collection a great deal of 'rich' information from a relatively small number of subjects when there is little known about the concepts under investigation or about the relationship between those concepts. Therefore, qualitative research should be regarded as the primary step in a study; designed to uncover the reasons, impressions, perceptions, and ideas that relevant individuals have about a particular subject.

According to Cavana et al. (2001), there are three qualitative research methods commonly used in business research: interviewing, focus groups, and observation. All methods have both advantages and disadvantages and it is difficult to select a particular one simply by comparing the advantages and disadvantages of each. This is because the strong point of one method tends to be the weakness of the other. Interviewing should be used in place of focus groups if the potential participants are likely to feel uncomfortable talking openly in a group. It is equally valid if a researcher wants to distinguish individual (as opposed to group) opinions about the issue under investigation (Boyce & Neale, 2006). For the purpose of this study, the in-depth interview was selected as the most appropriate approach for data collection and the most likely to produce the high quality of information required and much more detailed information than is available through other data collection methods, such as focus groups and observation (Cooper & Emory, 1995; Boyce & Neale, 2006). The nature of

the research informants was also considered when deciding upon the data collection method in this phase of the research. This is discussed in more detail in section 5.4.1 and summarised in Table 5.2.

5.4.1 Recruitment of informants

Qualitative research samples tend to be purposive, rather than random (Miles & Huberman, 1994). As Denzin and Lincoln (1994, p. 202) point out “many...qualitative researchers employ ... purposive, and not random, sampling methods. They seek out groups, settings and individuals where ... the processes being studied are most likely to occur.” Acknowledging the need for both applied and theoretical inputs and expertise, the sample was drawn from two separate sources: (i) educational experts in Taiwan’s HTVE; and (ii) senior managers of HTVE institutions in Taiwan.

At the beginning of the data collection phase, the researcher’s professional connections were used to locate potential informants or those who were willing to introduce the researchers to potential informants. Two channels were used to communicate with potential informants. First, a letter of recommendation written by Dr Kuo-Shung Cheng, President of Wu-Feng Institute of Technology and National Policy Advisor of the Office of the President in Taiwan, was faxed to each of 26 selected senior managers who held the position of president of the institution. Second, Dr Shang-Ping Lin, Director of the Technological and Vocational Education Evaluation Project and Dr Teng-Chiao Lin, Senior Specialist of the Department of Technological and Vocational Education, were contacted in person and their assistance was sought to identify another 10 potential informants who were eligible to participate in this study. Using this approach, 36 people were selected for the in-depth interviews. The researcher firstly sent a facsimile to each of the selected informants with a covering letter inviting them to participate in the interviews. After one week, the researcher commenced making telephone calls to ascertain whether they were interested in taking part. A total of 32 informants finally agreed to participate in the research. A summary of informant profiles is included in Table 5-2.

There are a number of views on the sample size for qualitative research. Patton (2002, p.184), for example, argues that “sample size depends on what you want to know, the purpose of the inquiry, what is at stake, what will be useful, what will have credibility,

and what can be done with available time and resources”. Sekaran (2003), however, suggests that sample sizes should range from 30 to 300, depending on the research problem. A sample size of 32 informants, as used in this qualitative study was therefore considered sufficient to provide ‘rich’ information and a meaningful outcome.

Table 5-2 Summary profile of the interviewees

Job/Position title	The number of interviews conducted
Senior managers of HTVE institutions in Taiwan	
Private institute of technology	10
Private university of technology	7
Private college	3
Public institute of technology	1
Public university of technology	7
Public college	1
Educational experts in Taiwan’s HTVE	
Senior Specialist of the Department of Technological and Vocational Education in Taiwan MOE	1
Director of TVE evaluation projects	1
Director of Board in a private institute of technology	1
Total	32

5.4.2 Interview process

The 32 in-depth interviews were conducted during a four-month period in Taiwan from November 2003 to March 2004. This was a period of time when the researcher was enrolled on a full-time basis. The duration of the interviews varied from 40-180 minutes. The average duration of the interviews was approximately 60 minutes. To accommodate informants, interviews were conducted in a variety of locations. Twenty-eight of the interviewees chose their offices as their preferred place of interview and four opted for the researcher to visit their homes.

A typical interview was as follows: greeting and introduction by the researcher; a brief explanation of the research project; a guarantee of anonymity in the thesis; and a discussion of ethics and the right to terminate interviews at any time. All of the interviews were digitally recorded with the permission of interviewees.

5.4.3 Interview questions and transcription

Prior to commencing the interviews, the researcher developed an interview guide, which included a list of topic headings and key questions, under the following three major headings (see Appendix 2 for the detailed questions):

- ◆ External industry structure: to identify the external industry structures that affect how HTVE institutions operate and perform in achieving competitive advantage. The previous studies of Dobni and Dobni (1996), Collis (1999), and Martinez and Wolverton (2009), which applied Porter's five-force model of competition to higher education, were used as a guide to classify the external industry structure in Taiwan's HTVE into five major themes. These themes are: competitive rivalry; threat of substitutes; threat of entrants; bargaining power of buyers; and bargaining power of suppliers.

- ◆ Internal resources: to determine the internal resources that provide HTVE institutions with a foundation for achieving competitive advantage. The previous studies of Hofer and Schendel (1978), Snow and Hrebiniak (1980), Barney (1991), and Verona (1999) were used as a guide to group the internal resources of Taiwan's HTVE institutions into six major themes. These themes are: organizational resources; human resources; financial resources; physical resources; marketing capabilities; and R&D capabilities.

- ◆ Institutional performance: to develop a range of performance indicators for evaluating the competitive advantage of HTVE institutions. The previous studies of Cameron (1978), Grunder (1991), and Welsh and Metcalf (2003) were used as a guide to categorize the indicators of institutional performance into three major themes. These themes are: student performance; staff performance; and institution-level performance.

During the interviews, the interview guide was used to ensure that all the requisite areas were covered while also providing interviewees with the opportunity to express their thoughts in-depth. There was some latitude given in the sequencing of the questions, in the amount of time and attention given to different topics according to the direction of the responses and perceived interests of the interviewees, as well as in the use of "probe" questions to clarify the meaning of responses where necessary.

The interview questions were developed in English then translated into Chinese for key informants. Replies were then translated back into English for data analysis. The two independent bilingual translators (research staff members working at the researcher's

institution) who hold a PhD in the field of English linguistics and are familiar with the main terminology used in business areas were invited to adjust and finalize the interview questions (transcript) and answers (key informants' responses to the interview questions). They were given both the Chinese version of the interview questions and answers along with the original English version interview questions and answers prepared by the researcher. Differences of wordings between the three versions (two versions by translators and one by the researcher) were discussed and amendments were made accordingly until consensus was achieved.

5.4.4 Data analysis

The aim of analysing textual data is to extract the essence of the informants' meanings as they are verbalized, either as intended or unintended accounts (Minichiello, Aroni, Timewell & Alexander, 1995). The interview transcripts were carefully studied for the purpose of recognizing meaningful themes (categories) to communicate the key issues. A process was followed that involved taking a number of steps that built upon each other (Patton, 2002). Firstly, responses to each of the questions from the 32 interviewees were grouped as a way of segmenting the data into manageable units (Minichiello et al., 1995). Next, to gain insight into the emerging patterns, the transcripts were read several times to find consistencies in the form of recurring concepts and words. Concepts were recorded and frequencies were examined for each question, and then, later, for all the data. All concepts were recorded as phrases or sentences so as to preserve the original intent (Punch, 1998). Through induction, the accumulated concepts and frequencies for all the interview material were then searched to allow sorting of "recurring regularities" into meaningful categories (Patton, 2002, p. 465). Closure was brought to the process when the sources of information were exhausted and the categories were saturated.

Each theme was then studied to identify sub-themes to add meaning and depth to the analysis. Frequency counts were performed to check that the sub-themes were representative (Miles & Huberman, 1994), with the concepts contributing to each sub-theme occurring a minimum of twice. Through the process of developing themes and sub-themes, labels were generated that encapsulated the meaning of the themes and sub-themes. Indicative quotes selected from the data served to illustrate each theme and sub-

theme, and to provide thick, rich, concrete description that depicted the intended meaning of the interviewees (Rubin & Rubin, 1995; Patton, 2002).

All themes were then evaluated by two criteria as developed by Patton (2002). Internal homogeneity, the first criterion applied to each emerging theme, judged the extent to which the data in a certain category held together in a meaningful way. The second criterion, external heterogeneity, was concerned with the extent to which differences between the themes were clear. In order to evaluate for internal homogeneity and external heterogeneity, the researcher was required to work back and forth between the transcripts and the categories to verify the accuracy and meaningfulness of the categories and the material constituting each theme and sub-theme (Patton, 2002).

The set of themes was checked for completeness. This was achieved in a number of ways. Firstly, the internal and external plausibility was checked. This is a property that Patton (2002, p. 466) called “integrability” and required the individual categories or themes to appear consistent when viewed internally, and to comprise a whole picture when the set is viewed externally. This meant that each of the themes developed from the elements that were “physically present and countable, were also studied for conceptual linkages, creating patterns that could be theoretically supported from the literature, while remaining consistent with the informants’ perspective” (Minichello et al., 1995, p.252).

Finally, to check that the set was reproducible, the data, the themes, and sub-themes were shown to a competent judge, a professional colleague of the researcher, to verify that the categories made sense; that the data were appropriately clustered in the category system; and that the category system fitted the data. Thus the themes presented in the next chapter are representative of the data collected, and although grounded in the data, seek to make theoretical sense of the information obtained from the interviews. The literature functioned to provide further understanding, to add meaning, and to judge the thematic analysis.

To ensure the anonymity of interviewees and assist readers, each of the interviewees was assigned a number somewhere between 1 and 32 based upon the order in which the

interviews were conducted. For reporting purposes, the identification number, the job title, and the type of institution were noted (see Appendix 1 for the details).

5.5 Stage two: quantitative research

A survey approach using a self-administered questionnaire was used to collect the data in this stage of the study. This approach was considered to be suitable given the nature of the research problem, and because it was believed to be an efficient and economical means of collecting the required data.

As there was no previously developed questionnaire to adequately handle the content specific to this study, a questionnaire was developed using the findings from the first stage of the research. The following sections describe the questionnaire development process, including the principles and practices of questionnaire design, the scaling method, the pre-test structure, and the modification of the questionnaire.

5.5.1 Questionnaire design

The primary aim of the survey was to gather the opinions of respondents regarding the effects of external industry structure and internal resources on the strategy and performance of HTVE institutions in Taiwan. The content of the questionnaire covered aspects in relation to external industry structure, internal resources, strategy types, and institutional performance, which reflected the literature and the findings of the qualitative stage of the research. The questionnaire was divided into five sections. The main sections of the questionnaire are outlined below and detailed in Appendix 3. First, the questionnaire included explicit instructions on answering the questionnaire, and the scope of the study was printed on the inside of the cover. The instructions offered as much information as possible and were written with simple word use in order to minimize confusion. The instructions emphasized that respondents should answer all the questions, and that all information would be treated confidentially and that anonymity would be provided. The sequencing of the sections was designed to create a flow of thought that the respondent could follow in answering the questions from the general to the specific (Kinnear & Taylor, 1996).

Section 1. External industry structure

This section was designed to lead the respondents into discussing the HTVE sector on

five major aspects: competitive rivalry, threat of substitutes, threat of entrants, bargaining power of suppliers, and bargaining power of buyers. The 16 items in this section were derived from the qualitative data gathered through in-depth interviews with senior managers of HTVE institutions and educational experts in Taiwan's HTVE.

Section 2. Internal resources

This section required the respondents to answer questions concerning the importance of internal resources in determining the competitive advantage of HTVE institutions. The questions covered six major functional activities of an educational institution, including organizational resources, human resources, financial resources, physical resources, marketing capabilities, and R&D capabilities. The 25 items were developed from the qualitative interview data with senior managers of HTVE institutions and educational experts in Taiwan's HTVE.

Section 3. Strategy types

This section included questions on the types of strategy undertaken by HTVE institutions. A total of eight questions were included on the questionnaire concerning marketing approach, product mix stability, market definition, competitive edge, environmental monitoring, attitude towards growth, customer base stability, and growth pattern. The eight items were taken from Miles and Snow's (1978) descriptions of the four strategies.

Section 4. Institutional performance

This section was designed to focus the discussion on the institutional performance measured by three levels: student, staff and institution. The 19 items in this section were based on the data collected through the in-depth interviews with senior managers of HTVE institutions and educational experts in Taiwan's HTVE.

Section 5. Respondent profile

Information was also collected on the type of institution, level of HTVE, student numbers and institute location. Finally, information was requested from respondents about their age, job position, income and work experience. These questions were left until the end of the questionnaire, as personal questions of this type can be sensitive or threatening to respondents at the beginning of a survey (Malhortra, 1996).

All questionnaire items were initially developed in English and subsequently translated into Chinese to reflect the primary language of the study population. Accurate translation of the questionnaire was of critical importance, as it could affect conceptual, instrument and measurement equivalence (Cavusgil & Das, 1997). To this end, a back-translation procedure was implemented as follows. Firstly, the original questionnaire was prepared in English and then translated into Chinese. It was then back-translated into English by two independent translators to check for equivalence. The questionnaire was also given to a number of language experts to ensure that the translation was of equivalent meaning in both versions.

5.5.2 Scaling

Scaling techniques provide researchers with a method of collapsing answers from a whole series into one indicator on how respondents really think about an issue (Salant & Dillman, 1994). The Likert scale requires respondents to indicate the extent to which they agree or disagree with each of a series of statements. A five-point Likert scale is the most common scale, developed by Dr Rensis Likert for behavioural sciences research (Kinnear & Taylor, 1996). It is widely accepted because it offers a range of choices to fit the needs of most situations. Other types of scales, such as the seven-point scale or even a ten-point scale are also available. In this study, most questions were proposed in the form of statements using a seven-point Likert scale, asking respondents to rate the level of their agreement assigned to (1) 'strongly disagree', (2) 'disagree', (3) 'slightly disagree', (4) 'neutral' (5) 'slightly agree', (6) 'agree', and (7) 'strongly agree'. Wuensch (2005) advocated using the seven-point scale because it makes finer distinctions in the measurement of opinion.

5.5.3 Pre-test and item modification

A pre-test was conducted to assess the questionnaire's strengths and weaknesses. As Kinnear and Taylor (1996) suggested, all aspects of the questionnaire should be tested before the questionnaire can be regarded as ready for administration. Pre-testing should be conducted with similar respondents to those who would be included in the actual survey (de Vaus, 2002). Since part of the measurement items were developed specifically for the purposes of this study, evaluating the questionnaire was considered to be necessary to verify its clarity before it was used on the sample population. The results of the pre-test were then used to modify and add questions.

The pre-test was conducted in two stages. Firstly, a draft of the Chinese version of the questionnaire was sent to 14 research professionals and university colleagues, inviting them to provide feedback and asking them to look for such things as difficulties with question wording, with leading questions, and bias due to order. Respondents were asked to provide a critical appraisal and to make comments with a view to amending the questionnaire. The purpose of this pre-test was not only to avoid linguistic errors that might have occurred in the translation process, but also to find out whether instructions could be followed readily by respondents, whether the questions could be easily understood, and how long it would take to complete. Any comments or suggestions made by respondents were also addressed. Some minor changes were made to the wording, phrasing, ordering and presentation of the questionnaire. By incorporating suggestions provided by the pre-test, some questions were altered to sound more natural in Chinese without detracting from the meaning of the original sentences.

The second pre-test was then conducted by sending the modified questionnaire to 40 senior managers in HTVE institutions. Respondents were asked for their opinions and critical appraisal of the preliminary questionnaire. They were also asked to evaluate the questionnaire for clarity, style, meaningfulness, ease or difficulty of completion. Revisions were then made based on this feedback to ensure consistency and quality prior to final distribution of the questionnaires. This assured that the questionnaire was clear and well-understood by potential respondents.

5.5.4 Sampling

Sampling ensures that a sufficient number of elements of a given population form the basis for drawing conclusions for the whole population (Cavana et al., 2001). The objective of this study was to develop a model of competitive advantage for Taiwan's HTVE from the supply side perspective. Given that the senior managers have more power and influence to direct and plan the development of an institution, presidents, vice-presidents, deans of student affairs, general affairs, academic, and R&D managers were considered the most desirable sample for the quantitative part of this study. The senior managers were to be selected based on their current job positions in HTVE institutions. Within a total of 89 HTVE institutions in Taiwan, 480 senior managers met the above criterion. These senior managers formed a final sampling frame.

The researcher acknowledged that a lack of randomness in the choice of sampling frame was a limitation. After considering the trade-off needed between randomness and sample qualification, and time and budget constraints governing the study, it was decided that the qualification of the sample members was a priority. A purposive sampling method was applied in this study. This technique was considered to be appropriate when faced with a situation in which some characteristics of the sample group are required to serve a specific purpose (Zikmund, 2000).

In order to access lists of senior managers from each HTVE institution, the Taiwan MOE was contacted. The mailing list from the Taiwan MOE contains all major senior managers within HTVE institutions, although the information is somewhat out of date. The researcher took account of the possibility of personnel relocation. The Internet homepage of each institution was then searched for the updated contact details of the selected sample. Finally, telephone calls were made to confirm these contact details.

5.5.5 Data collection method

A mail survey was considered appropriate for this study as Taiwan has a relatively low cost and reliable postal system and high literacy levels. The researcher acknowledges the problem of low response rates as a possibility in such a mail survey. However, taking into account all factors, including obtaining sensitive information, anonymity of the respondents, respondents located Taiwan-wide, and cost, the mail survey was deemed to be the most suitable means of collecting the data.

The mail survey package comprised outgoing envelope, cover letter, questionnaire, and reply-paid envelope. An official Victoria University envelope was used and an A4 size envelope allowed for professional presentation of the contents. The envelope labels were printed with each respondent's name, title, and contact address. Personalized cover letters were printed on Victoria University letterhead. The cover letter outlined the aims of the research project; indicated to the respondents the approximate time needed to complete the questionnaire; emphasized the confidentiality of the research; and offered to provide a summary of the research results to respondents at the conclusion of the study.

The six-page questionnaire was bound in a colored cover printed on University

letterhead. The return address and researcher's name were included on the cover, in case respondents lost the reply paid envelope. 'All information will be strictly confidential' was also printed on the questionnaire cover. A reply paid return envelope was attached to the back of each questionnaire with an address, researcher's name and reply-paid number label on each envelope.

After the questionnaire package was sent, a second mail out was made ten days after the first mail out. At the same time, telephone contacts with first-mailing non-respondents were made. The same procedure was undertaken 10 days after the second mailing. The aim was to communicate personally to explain that their participation would be very important to the research. In the telephone contact, some people agreed that they were going to send back the questionnaire quickly and others had yet to receive the questionnaire and were sent a new copy. The survey period was from November 2004 to February 2005. In total, 480 senior managers were approached to participate in this survey. A total of 323 completed questionnaires were returned to the researcher for analysis. Thus, an effective response rate of 67.29% was attained.

5.5.6 Data analysis

Once the quantitative data were obtained via the survey, the data were checked for missing values, inconsistencies and any other response errors. A coding manual was constructed which contained general instructions on how each variable was coded. For quantitative data input and analysis, the Statistical Package for Social Science (SPSS) was used. The coded data were rechecked visually for the detection of any possible data entry errors. Descriptive statistics were computed for all the variables for accuracy of inputs as follows: the range of each variable was checked for out-of-range values; frequency counts were performed; the distribution of each variable was analyzed to detect irregular answers and cases with extreme values; and the means and standard deviations were computed. In order to test the proposed conceptual framework, the following methodological techniques were used to analyze the data.

- ◆ Factor analysis. The purpose of factor analysis is to summarize or reduce the data contained in a number of original variables into a smaller set of composite factors. The factor analysis is useful in exploring the key factors of each aspect of the conceptual framework, when faced with a situation where a concept consists of

more than one underlying factor (Churchill, 1979). The existing literature has revealed two essential assumptions underlying exploratory factor analysis: the importance of a sufficiently large sample size and the appropriate factorability of the data. For the reliability of exploratory factor analysis, it is essential that sample size should be sufficiently large. Hair, Anderson, Tatham and Black (1998) suggested that the sample size should be 100 or larger. Comrey and Lee (1992) listed as a guide, sample size of 50 as very poor, 100 as poor, 200 as fair, 300 as good, 500 as very good and 1000 as excellent. Tabachnick and Fidell (2001, p.588) noted, “as a general rule of thumb, it is comforting to have at least 300 cases for factor analysis”. Given these definitions, the sample size of 323 for this survey was sufficiently large enough for exploratory factor analysis.

Bartlett’s test is used to test that the correlation matrix is an identity matrix. If the Bartlett’s test statistic is large and significant, then factorability is assumed. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is used to compare the magnitudes of the observed correlation coefficients to the magnitudes of the partial correlation coefficients. A value of 0.60 or above from the KMO measure of a sampling adequacy test indicates that the data is adequate for exploratory factor analysis (Tabachnick & Fidell, 2001). In this study, the factor analysis was conducted to explore the major elements within the factors of external industry structure, internal resources, and institutional performance. The Bartlett measure for all factor analyses was over the significant level .0000. The KMO measure for all of the factor analyses was 0.60 or above, which is acceptable. The steps of exploratory factor analysis are discussed in detail in Chapter Seven.

- ◆ Cluster analysis: The purpose of cluster analysis is to classify individuals into mutually exclusive and collectively exhaustive groups. In this study, the respondent sample consisted of a mix of senior managers from different HTVE institutions. The types of strategy undertaken by HTVE institutions are likely to be different. Therefore, hierarchical clustering was applied to identify the number of clusters needed. Once decided, K-means clustering was used to group individuals according to their response patterns to the use of strategy types. The method used here was an agglomerative hierarchical procedure.

- ◆ Discriminant analysis: The purpose of the discriminant analysis is to predict group membership in two or more mutually exclusive groups from a set of predictors. A posterior possibility of group membership for each case is calculated. This posterior possibility is the probability of case membership in a group based on the case's data. The case is predicted to be in the group for which the case's posterior possibility is maximum (compared to the posterior possibility for other groups). If a case's calculated posterior possibility of belonging to a pre-determined group is not the maximum one, the case's initial assignment will be judged as being misclassified into that group. An error rate (probabilities of misclassification) estimate for a whole group will be calculated. Discriminant analysis is used in this study to assess the adequacy of classification. It serves as a complement to cluster analysis.

- ◆ Analysis of variance: The purpose of analysis of variance (ANOVA) is to examine the significant mean differences among more than two groups on an interval- or ratio-scaled dependent variable. The results of ANOVA demonstrate whether or not the means of the various groups are significantly different from one another, as indicated by the F statistic. When significant mean differences among the groups are indicated by the F statistic, several tests, such as Scheffe's test, Duncan Multiple Range test, Tukey's test and Student-Newman-Keul's test, are available and can be used to detect where exactly the mean differences lie. For the purposes of this study, ANOVA was used to test the following hypotheses: H₁: whether HTVE institutions that adopt different types of strategy have significantly different perceptions of their external industry structure; H₃: whether HTVE institutions adopt different types of strategy based on the combinations of resources that they have; and H₅: whether institutional performance differs based on different types of strategy that HTVE institutions adopt.

- ◆ Multiple regression analysis: The purpose of multiple regression analysis is to identify changes in independent variables that are significant predictors of changes in a dependent variable and in so doing, build a linear model that describes these relationships. How well the resulting model fits the population is indicated by the coefficient of determination (i.e. R-square, R²), which is actually the square of the Pearson correlation coefficient between the predicted and obtained dependent

variable. R^2 is 1 for 100% fit and 0 if there is no linear relationship. In this study, multiple regression analysis was undertaken to test the following hypotheses: H_2 : whether there is a negative relationship between external industry structure and institutional performance; and H_4 : whether there is a positive relationship between internal resources and institutional performance. The Durbin-Watson test statistic is then designed for detecting errors that follow a first-order autoregressive process. The Durbin-Watson statistic provides the standard test for autocorrelation (Durbin & Watson, 1950, 1951). Autocorrelation occurs when the error between the fitted and actual value is not independent from one observation to the next. A Durbin-Watson statistic between 1.5 and 2.5 indicates that there is not serious autocorrelation. A Durbin-Watson outside this range indicates the probability of autocorrelation.

5.6 Reliability and validity

Reliability refers to the extent to which a scale produces consistent results if repeated measurements are made (Malhotra, 1996). The purpose of the reliability assessment is to check the validity and to improve the quality of the measure. The multi-item measurement scale for tapping into a construct is one suggested way of improving reliability and decreasing measurement error (Peter, 1979). Cronbach's alpha (Cronbach, 1951) is the most common method accepted by researchers in assessing the reliability of multi-item measures. It is a measure of the internal consistency of a set of items, and is considered "absolutely the first measure" one should use to assess the reliability of a measurement scale (Churchill, 1979). A low Cronbach's alpha indicates that the sample of items does not capture the factor and is not shared in the common core of the construct. Such items should be eliminated in order to increase Cronbach's alpha. There is no set standard regarding the minimum acceptable threshold value of Cronbach's alpha, but Nunnally (1978) suggested that 0.70 is an acceptable reliability coefficient. Hair et al. (1998) noted that the generally agreed upon lower limit for Cronbach's alpha is 0.70, although it may decrease to 0.60 in exploratory research. In the case of this study, Cronbach's alpha was calculated for the major factors of external industry structure, internal resources, strategy types, and institutional performance. All Cronbach's alphas were at an acceptable level, and ranged between 0.69 and 0.95. The results are presented in Table 5-3.

Validity refers to “the extent to which differences in observed scale scores reflect true differences among objects on the characteristic being measured, rather than systematic or random error” (Malhotra, 1996, p.306). There are three main types of validity: content validity, criterion validity, and construct validity. Content validity can be assured by agreement among experts that the scale is measuring what it is supposed to measure. In this study, the self-administered questionnaire was prepared based on concepts of the developed model and the results of the in-depth interviews. The pre-test helped in establishing content validity. Criterion validity examines whether measures perform as expected in regard to other constructs selected as meaningful criteria, and can be categorized into concurrent and predictive validity. This measure of validity used to be popular (Peter, 1979). However, its popularity has vanished with the increasing use of construct validity in current studies. Construct validity directly addresses the question of what the instrument is actually measuring (Churchill, 1995). It testifies to how well results obtained from the use of measures fit the theories around which the test is designed. This is assessed through convergent and discriminant validity, which can be established by factor analysis, as explained in the following section in detail. Several multiple regression analyses were used to examine how external industry structure and international resources and capabilities as independent variables may predict the variance in dependent variables of strategy types and institutional performance.

Table 5-3 Cronbach's alphas for the four major factors

Factors	Items	Cronbach's alpha
External industry structure (16 items)	QA1. Threat from foreign institutions of higher education	0.69
	QA2. Threat from domestic academic universities	
	QA3. Threat from China-based institutions of higher education	
	QA4. Threat from private business enterprises	
	QA5. The increase in the number of HTVE institutions	
	QA6. The decrease in the number of HTVE students	
	QA7. The high intensity of competition between institutions	
	QA8. The minimum number of students required for the operation of an educational institution.	
	QA9. The minimum capital required for establishing a new institution	
	QA10. The regulations and policies of government on the operation of an educational institution	
	QA11. The power of faculties	
	QA12. The power of vocational high schools	
	QA13. The power of the Taiwan MOE	
	QA14. The power of students	
	QA15. The power of parents	
	QA16. The power of employers	
Internal resources (25 items)	QB17. Personnel staffing	0.95
	QB18. Faculty qualifications	
	QB19. Job loyalty	
	QB20. Teamwork building	
	QB21. Leadership	
	QB22. Sufficient financial capital	
	QB23. Financial planning and budgeting	
	QB24. Financial implementation	
	QB25. Teaching and research infrastructure	
	QB26. Campus facilities	
	QB27. Campus location	
	QB28. Organizational structure	
	QB29. Organizational efficiency	
	QB30. Integration of administrative resources	
	QB31. Curriculum design	
	QB32. Curriculum quality	
	QB33. Range of majors and degree programs	
	QB34. Participation in government-funded research projects	
	QB35. Collaboration with private business enterprises	
	QB36. Integration of academic and research resources	
	QB37. Strategic alliances with vocational high schools	
	QB38. Partnership with other higher education institutions	
	QB39. Media promotion	
	QB40. Scholarships and financial aids offered	
	QB41. Participation in off-campus activities and events	

Table 5-3 (cont.) Cronbach's alphas for the four major factors

Factors	Items	Cronbach's alpha
Institutional performance (19 items)	QC42. Employment rate of new graduates	0.94
	QC43. Percentage of graduates pursuing further studies	
	QC44. Pass rate on certificate/licensure exams	
	QC45. Professional knowledge and capabilities of graduates	
	QC46. Staff performance in academic research	
	QC47. Staff performance in applied research	
	QC48. Staff performance in teaching	
	QC49. Practical experience and skills of teaching staff	
	QC50. Institutional culture	
	QC51. Graduate/alumni evaluations	
	QC52. Institutional distinctiveness	
	QC53. Community service	
	QC54. Holistic education development	
	QC55. Professional curriculum development	
	QC56. Institutional reputation	
	QC57. Facilities management	
	QC58. Industry-academia collaboration	
	QC59. Magazine ranking	
	QC60. Industry's evaluation on the quality of graduates	
Strategy Types (8 items)	QD61. Marketing approach	0.82
	QD62. Product mix stability	
	QD63. Market definition	
	QD64. Competitive edge	
	QD65. Environmental monitoring	
	QD66. Attitude towards growth	
	QD67. Customer base stability	
	QD68. Growth pattern	

5.7 Summary

This chapter has outlined the research paradigm of the study and detailed the two-stages of the research undertaken. In the first stage of qualitative research, the elements of competitive advantage and the indicators of institutional performance captured in the framework were generated via the interviews with a sample of 32 senior managers and professionals in the Taiwan's HTVE field. The second stage of the research involved a survey of 323 senior managers of Taiwan's HTVE institutions.

This study used five methods of quantitative analysis: factor analysis, cluster analysis, discriminant analysis, analysis of variance, and multiple regression analysis for the following purposes: (i) to analyze the types of strategy adopted by HTVE institutions to best fit with their internal and external environments; (ii) to ascertain the major factors of external industry structure, internal resources, and institutional performance; and (iii) to examine the relationships between external industry structure, internal resources, and strategy types with institutional performance in the context of Taiwan's HTVE. The following chapter presents the findings of the qualitative stage of the research.

CHAPTER 6: QUALITATIVE RESEARCH FINDINGS

6.1 Introduction

In this chapter, the findings of the qualitative research are presented and organized into three main categories for ease of presentation. Section 6.2 addresses the external industry structure that may influence the way HTVE institutions operate and perform in achieving competitive advantage. Section 6.3 focuses on the internal resources HTVE institutions should be equipped with to achieve competitive advantage. Section 6.4 presents the indicators selected to evaluate and monitor the outstanding achievement and superior performance of HTVE institutions. These findings are related back to the literature review.

6.2 Major elements of external industry structure

With reference to the effects of external industry structure, the following five themes were identified as the strongest areas of concern: the intensity of competitive rivalry; the threat of entrants; the threat of substitutes; the bargaining power of suppliers; and the bargaining power of buyers. These themes were mainly derived from Porter's five-force model of competition. For each theme, a number of sub-themes were identified. An overview of the themes and sub-themes is presented in Table 6-1, and more detailed discussion of them is provided in Sections 6.2.1 to 6.2.5.

Table 6-1 External industry structure: themes and sub-themes

Themes	Sub-themes
Competitive rivalry	increase in the number of HTVE institutions, decrease in the number of HTVE students, high intensity of competition between institutions
Threat of substitutes	threat from domestic academic universities, threat from foreign institutions of higher education, threat from China-based institutions of higher education, threat from private business enterprises
Threat of entrants	regulations and policies of government on the operation of an educational institution, minimum number of students required for the operation of an educational institution, minimum capital required for establishing a new educational institution
Bargaining power of buyers	power of students, power of parents, power of employers
Bargaining power of suppliers	power of the Taiwan Ministry of Education, power of vocational high schools, power of faculties

6.2.1 Competitive rivalry

All the interviewees indicated that the intensity of competition in Taiwan's HTVE sector can be measured by three components, namely the number of HTVE institutions,

the number of HTVE students, and the level of competition within the HTVE sector. Several comments were made that illustrate these points.

Increase in the number of HTVE institutions

The number of both institutes of technology and universities of technology has increased greatly. This may be attributed to the educational reform policy, with the educational authorities allowing many colleges to upgrade to university status. This significant structural change over the last 10 years has heightened the intensity of competition. The following comments are typical of what the interviewees said:

The HTVE sector has already saturated because a sizable number of HTVE institutions has been upgraded from college level to university level. An increasing number of HTVE institutions may lead to more intense competition and could create an incentive for school improvement. The competition may also force institutions to be more responsive to students' needs and react to their concerns. [22, indicating the identification number of the interviewee, President of private college, indicating the job title and the type of institution of the interviewee]

Oversupply (i.e. the increased number of HTVE institutions) has made competition more intense in the HTVE sector. Institutions that are not committed to further improvement should be forced to quit the market. [19, President of private university]

Taiwan's HTVE sector is facing the challenge of competition in the domestic market because of the rapid increase in the number of educational institutions.

Decrease in the number of HTVE students

The number of students enrolled in HTVE institutions has decreased and will likely continue to do so in the short-term. As already indicated, this relates to the steady decline in both Taiwan's birth rate and the number of students studying at vocational high schools. One interviewee [20, President of private university] explained:

The number of vocational school graduates has decreased constantly in recent years. A large part of the reason is because most people have preferred education

through high-status general academic studies rather than low-status vocational and technical education. Another reason for this decline is the low birth rate. Unfortunately, the demand and supply don't match.

Another interviewee commented [7, President of public university]:

As the number of HTVE institutions has increased, the birth rate in Taiwan has continued to decline. As a result of that, many HTVE institutions are faced with the danger of closing due to lack of students.

While the decline in the birth rate continues to impact the demand for education in Taiwan, the shrinkage of the technical and vocational education market puts more pressure on HTVE institutions to attract students and remain financially viable.

High intensity of competition between institutions

While highly-skilled individuals are required to meet future workforce needs, HTVE institutions have a critical role to play in producing an adequate supply of high quality employees. Having this ambition in mind, many HTVE institutions are eager to expand their degree programs to meet the needs of industry so that the minimum number of students for enrolment can be assured. However, the nature and content of curriculum assigned to students in different HTVE institutions are similar, with no particular differentiation for students of varying abilities (Chang et al., 2005). One interviewee [13, President of private college] expressed some concern about the resulting problem of the high intensity of competition in the local HTVE market:

The competition is anticipated to increase with low differentiation in the products and services offered by the competitors. Taiwan's HTVE market is becoming more competitive. This is particularly the case when institutions located in the same region offer similar and identical courses.

Many of the interviewees spoke of the situation in Taiwan's HTVE sector and the increasing pressures on HTVE institutions. One interviewee [30, President of private institute] commented:

Competition among HTVE institutions will be more intense. This is attributable to the homogeneity of educational products and services, which facilitates substitution by consumers and enhances competition among suppliers.

With the increase in intensity of competition in Taiwan's HTVE sector, no institution can avoid fighting for survival.

6.2.2 Threat of substitutes

As noted previously, Taiwan's HTVE sector is facing a strong threat of substitution from both domestic and international education providers. In the domestic context, the possible substitutes for HTVE institutions are academic universities and private business enterprises. In the international context, Chinese-based institutions of higher education and institutions of higher education in developed countries (such as USA, UK, Japan or Australia) are the major substitutes for Taiwan's HTVE institutions.

Threat from domestic academic universities

Domestically, the threat to the HTVE sector comes from academic universities that have long histories, good academic reputations and superior teaching and research achievements. One interviewee [20, President of private university] said:

The technical and vocational education system will be substituted for, or be forced to merge with the university system. In the eyes of the Taiwanese people, traditional academic education is better than technical and vocational education. In fact, academic universities have been performing better than HTVE institutes in terms of teaching staff and student outcomes.

Another interviewee [7, President of public university] commented that:

On average, academic universities, especially publicly owned, have had high quality faculty and have gained prestigious reputations of excellence in the mind of Taiwanese people. They are the major substitutes for HTVE institutions.

As such, domestic academic universities remain the major competitors of HTVE institutions.

Threat from private business enterprises

As noted by Collis (1999), employers no longer regard the provision of undergraduate or postgraduate education as sufficient to satisfy the life-time learning needs of their workforce. In response to these ongoing learning needs, employers have taken an active stance by offering a series of training opportunities to their employees, either in-house or with third party suppliers. It is believed that this kind of non-traditional learning will become more and more popular and is practiced among private business enterprises all over the world. One interviewee [26, President of private institute] indicated:

The in-house training and education market is estimated to grow steadily. This new form of education and learning is usually used to enhance efficiency and productivity as well as to lower costs. It represents one substitute for traditional higher education. The employees are also responding to the appeal of in-house training and education programs that will upgrade and update their occupational skills.

Another interviewee [13, President of private college] commented that:

There are a number of private business enterprises offering this kind of non-traditional learning. Examples are McDonald's Hamburger University, the Disney Institute, General Electronics' Crotonville Training Centre etc...It is worth noting that the recent development of technology creates the opportunity for business enterprises into the HTVE sector to develop educational programs that provide alternatives for parts of the traditional higher educational experience.

It appears that the in-house training and workplace education offered by private business enterprises has become a serious substitute for HTVE. However, this also represents a new market opportunity. HTVE institutions could also provide enterprises with a range of in-house training and workplace education options designed specifically to meet individual organizational goals.

Threat from foreign institutions of higher education

Since its entry into the WTO in 2002, Taiwan has had to open its educational market to foreign institutions of higher education that can publicize their degree programs and officially recruit local school-aged students. The following comments are indicative of the opinions of many of the interviewees about this situation:

The HTVE market has been very competitive in terms of student recruitment. The opening of the market will bring more competitors. However it will provide the Taiwanese people with meaningful opportunities for education. [26, President of private institute]

The foreign institutions of higher education have the advantages that local based institutions don't have. The three formidable advantages are: interactive lectures, courses lectured in English, flexibility of long distance learning, etc... [7, President of public university]

Given the impact of globalization on education, foreign institutions of higher education are likely to be major competitors of Taiwan's HTVE institutions.

Threat from China-based institutions of higher education

Economic ties between Taiwan and China are already considerable. While the Taiwan MOE still dismisses mainland China's academic institutions and degrees, their higher education programs have become attractive to Taiwanese students. Consequently, HTVE institutions will face a continued shortage of students, or another wave of the brain-drain (*Taipei Times*, cited in Schichor, 2006). One interviewee [19, President of private university] remarked:

Chinese-based institutions of higher education are perceived as a significant threat to Taiwan's HTVE given the same language and similar culture.

Another interviewee [26, President of private institute] claimed:

It is worth noting that Taiwanese students who are considering study abroad might go to China not only because higher education is less expensive but also because its quality is improving.

Taiwan's HTVE sector is exposed to competition from both domestic and international rivals. Thus, HTVE institutions have to compete with a variety of higher education providers within the island and from overseas.

6.2.3 Threat of entrants

All the interviewees indicated that it would be wise for new institutions wishing to enter the HTVE sector to seriously consider the government regulations and policies relating to the operation of an educational institution, the minimum number of students and the minimum capital required for establishing a new institution.

Government regulations and policies relating to the operation of an educational institution

The match between educational demand and supply has become a serious concern in education policy-making. Changes in demographic or environmental factors, changes in people's education needs, and changes in the amount and types of available resources is likely to lead to an imbalance of supply and demand. Education policy-makers, therefore, should try their best to avoid over-supply or under-supply situations and to strive to balance the educational demand and supply (Cheng, Ng & Mok, 2002). With the increasing intensity of Taiwan's HTVE sector, more than half of the interviewees commented that the educational authorities should impose strict regulations governing the operation of an institution. As one interviewee [24, President of private institute] indicated:

The educational authorities are responsible for ensuring the institutions operate normally. As such, there needs to be stricter regulations governing the establishment, merger, partition or closure of institutions. Although the government allows foreign institutions of higher education to recruit students in Taiwan, heavy restrictions should be imposed to make their entry difficult.

It is imperative that Taiwan's educational authorities engage with the HTVE sector and impose strict regulations governing the operation of HTVE institutions. In particular, those established HTVE institutions should be well protected from closure.

Minimum number of students required for the operation of an educational institution

Almost two-thirds of the interviewees have indicated that barriers to entry into the HTVE sector are substantial. The capital cost of becoming a participant, such as high costs of developing the technology, the price of acquiring premises and, indeed, even the extent of intellectual capital, to name but a few, are prohibitive (McElwee & Pennington, 1993). One interviewee [28, President of private institute] referred to the economies of scale as "*the expectation that the operating expense ratio of an institution should decline as its student enrolment increases.*"

In order to achieve economies of scale, one respondent [1, Board Director of private institute] claimed that "*the required minimum number of students is 5,000*", whereas another interviewee [24, President of private institute] noted "*the base point is 4,000 students.*" Another interviewee [25, President of private institute] said:

The minimum of the acceptable range is between four thousand and five thousand students. However, it is really a challenge for a new school to recruit this amount of students in a very short period of time.

Finally, a rhetorical question that seemed to summarize most comments is "*If a HTVE institution is unable to recruit enough students, how can it survive?*" [14, President of private university]

The minimum number of students necessary to maintain the operation of an educational institution is debatable, but remains a top priority for those established HTVE institutions.

Minimum capital required for establishing a new institution

The operation of an educational institution requires not only the existence of economies of scale, but also a large amount of capital investment. One interviewee [1, Board Director of private institute] explained that "*capital refers to the money, property, and*

other valuables which collectively represent the wealth of an educational institution.”

Another interviewee [25, President of private institute] commented on the necessity of sufficient capital for investment as a critical prerequisite for an institution to be ready for operation:

Large capital investments on both physical and human resources are required. However, for those who are just entering the HTVE market, there is a high probability that the institutions will lose money in the beginning because of the low student enrolment rate.

As such, the capital requirements, the minimum number of students, and the government regulations and policies might act as barriers that prevent the potential entrant from quickly establishing a new institution in the HTVE market.

6.2.4 Bargaining power of buyers

Because institutions of higher education are engaged in a service activity, the term buyer, in this context, refers to the institution's main customers - students. The first and foremost clientele served by higher education are the students (Downey, Frase and Peters, 1994; Michael, Sower & Motwani, 1997). Other parties that benefit from quality education, such as parents, industry and society fit the definition of beneficiary (Scrabec, 2000). Consistent with the previous findings, all the interviewees referred to the students, parents and employers as the primary customers of the HTVE institutions.

Power of students

Within the system, the student participates in the learning process, and is an internal customer. While he/she leaves the system and functions effectively in society, he/she becomes the ultimate external customer. Comments made by several interviewees illustrated this understanding:

Students, as consumers of knowledge, are the primary customers of HTVE institutions. They can give subtle feedback on the quality of the education delivery process. Therefore, their satisfaction is the ultimate objective of HTVE institutions.
[21, President of private institute]

Like other levels of education, HTVE provides value-added service to learners, where the learner, the student, is the primary customer. [1, Board Director of private institute]

A student's decision about which institution he/she wants to attend is likely to affect the institution's competitive position in the market.

Power of parents

Parents of students are regarded as beneficiaries (Stage & Hossler, 1989; Kim, 2002) influencing their children's decisions on their choice of HTVE institutions and majors. Previous studies have indicated that parents' educational expectations for their children strongly influence students' aspirations toward higher education (Hossler, Braxton, & Coopersmith, 1989; Stage & Hossler, 1989; Kim, 2002). Therefore, it is imperative to take into account parents' expectations regarding the value and benefits of HTVE, in addition to students' expectations. As one interviewee remarked [2, Senior Specialist of Ministry of Education]:

Parents of vocational school students may exert more influence on a student's choice of a school. Because parents play a key role in influencing a young person's decision about which career path they should follow, HTVE institutions need to let them know what's going on and their children's learning process.

Given the influence of parents on children, it is necessary for HTVE institutions to examine the power of parents in their children's decision-making process.

Power of employers

Employers are also considered to be potential customers of HTVE. This rationale is further supported by Michael et al. (1997), who indicated that one of the important customers of a higher education institution is the future employer as a consumer of the student product. The following comment was consistent with all the interviewees who referred to the future employer as the customer:

The purpose of HTVE is to prepare students to be ready for work and future employment. Future employers are the ultimate consumer of the student product.

[20, President of private university]

There is a perception, therefore, that students, parents and employers are the foremost components of the clientele served by HTVE.

6.2.5 Bargaining power of suppliers

When considering the major suppliers of students/customers for HTVE, all of the interviewees identified vocational high schools, faculties, and the Taiwan MOE as the three most important ones. All have varying roles in engaging in both financial and non-financial activities.

Power of the Taiwan Ministry of Education

More than three-quarters of the interviewees commented on the role of the education authority - the Taiwan MOE - in school funding. For example, one interviewee [2, Senior Specialist of Ministry of Education] said:

The MOE is a supplier who provides the government's subsidies to Taiwan's HTVE institutions. All public colleges, institutes and universities of technology receive government funding. Public institutions receive their annual budgets from the government, whereas government subsidies to private institutions are limited and tuition is one of their major sources of revenue.

This quote from the senior specialists in the MOE exemplifies many of the other comments made by interviewees about this topic.

In this context, if HTVE institutions rely heavily on funding and subsidies from the MOE as a backup for their sustainable operations, the authorities could exert influence on their operations and development.

Power of vocational high schools

From the supply/demand point of view, many of the interviewees spoke of vocational high school students as the major source of HTVE institutions. For example, one interviewee [8, Dean of Academic Affairs of public university] said:

Given that the educational system is a production process, vocational high schools are suppliers of 'raw materials' where their graduates often continue on to higher education. The more students that graduate from vocational high schools, the more vocational high school graduates will continue on to HTVE.

In Taiwan's education system, the student who has received senior secondary vocational education will usually pursue further education after graduation. Therefore, vocational high schools are considered one of the major suppliers to the HTVE sector.

Power of faculties

More than 80 percent of interviewees remarked that the power of faculties as suppliers of knowledge has increased steadily in recent years because of the growing recognition of the value of knowledge. This is consistent with Collis' (1999) view that the commercial value of academic knowledge and ideas has increased; faculties themselves should earn a share of the benefits produced by their knowledge and ideas. One interviewee [4, Secretary General of public university] noted:

The principal goal of faculties is to provide their students with knowledge and a richer learning experience. In this context, the faculties are one of the important suppliers in terms of the production and delivery of academic knowledge and ideas.

Given that faculties are a supplier of HTVE, their power vis-a-vis institutions has considerably improved. In particular, the 'superstar faculty phenomenon' has increased competitive bidding among higher education institutions for talent (Collis, 1999).

6.3 Major elements of internal resources

In terms of internal resources, the information gathered from the interviewees was classified into the following themes, which link to the six factors of internal resources identified in the literature (Hofer & Schendel, 1978; Snow & Hrebiniak, 1980; Barney,

1991; Verona, 1999): organizational resources; human resources; financial resources; physical resources; marketing capabilities; and R&D capabilities. For each theme, a number of sub-themes were identified. An overview of the themes and sub-themes is presented in Table 6-2, and a more detailed discussion of them provided in Section 6.3.6.

Table 6-2 Internal resources: themes and sub-themes

Themes	Sub-themes
Organizational resources	organizational structure, organizational efficiency, integration of administrative resources
Human resources	faculty qualifications, team building, leadership, personnel staffing, job loyalty
Financial resources	sufficient financial capital, financial planning and budgeting, financial implementation
Physical resources	campus location, campus facilities, teaching and research infrastructure
Marketing capabilities	media promotion, scholarship and financial aids offered, participation in off-campus activities and events, strategic alliances with vocational high schools, partnerships with other higher education institutions
R&D capabilities	curriculum design, curriculum quality, range of majors and degree programs, collaboration with private business enterprises, participation in government-funded research projects, integration of academic and research resources

6.3.1 Organizational resources

If the core business of higher education institutions is teaching and research then the organizational framework in which it is delivered represents a key variable in factors that contribute to success (Shattock, 2003). According to the comments of the interviewees, the three major elements in determining the organizational framework were organizational structure, organizational efficiency, and integration of administrative resources.

Organizational structure

The structure of an organisation has been described as a tree, with the roots representing the president and the board of directors, the branches typifying the various departments and the leaves representing the staff (Chandler, 1988). There is a clear line of authority indicating where subordinates are accountable to their immediate supervisors. Shattock (2003) notes that the organizational structure varies in different higher education institutions depending on an institution's age, size, disciplinary mix, and physical location. More than half of the interviewees reported that privately-owned institutions are more flexible, because of their smaller size and less hierarchical levels of organizational structure. One interviewee [4, Secretary General of public university] explained that:

Flexible organizational structures keep our school interactions dynamic and substantive. Empowerment is also important for keeping staff satisfied and productive. The president is unable to manage everything. Everyone should be responsible for school progress and development. Thus, flexible structure allows institutions to be operated effectively and efficiently.

According to Madu and Kuei (1993), many educational institutions are bureaucratic. Disadvantages of a bureaucratic structure include a lack of positive and timely feedback from top management and departmental isolation with no connection to the whole. The bottom-up approach is often inflexible once decisions are made. Also, many administrators have varying degrees of power and occupy ill-defined positions. As a result, the reporting system is unclear and faculty often see themselves as mere numbers fighting for their own survival not for the institution (Madu & Kuei, 1993). Thus, if HTVE institutions are to successfully implement their chosen strategy, it is essential that they devise an appropriate organizational structure and design. This needs to reflect an institution's desired outcomes, creating mechanisms for the measurement of institutional performance and ensuring that faculty members work towards a common goal.

Organizational efficiency

The ability of HTVE institutions to achieve their goals can be reflected by the level of organizational efficiency. Efficiency refers to the ability of an institution to make good use of energy, time, money, personnel and materials to produce desired outcomes. In the context of higher education, it has most often been measured by indicators such as costs per student, student-faculty ratios, costs per faculty members, costs per square foot, and so on (Cameron, 1978). As one interviewee [4, Secretary General of public university] indicated:

It is important that all resources owned by schools are allocated in the appropriate places.

Another interviewee [21, President of private institute] commented:

Compared to newly established institutions, old institutions tend to reduce the level of efficiency in bureaucracies. Newly established institutions generally achieve a high level of efficiency.

Organizational efficiency determines the overall performance of HTVE institutions. Therefore, the enhancement of administrative efficiency is a critical issue for HTVE institutions.

Integration of administrative resources

As already indicated, oversupply (i.e. the increased number of HTVE institutions) has made competition more intense in the HTVE sector. Institutions have to compete to raise funds and to attract qualified students. In order to survive, one interviewee [30, President of private institute] placed an emphasis on the integration of administrative resources, stating:

HTVE institutions need to find the best solution by integrating resources between institutions and sharing the resources with each other.

Integration between HTVE institutions is highlighted as an important future trend, as another interviewee [6, president of public university] noted:

The purpose of integration is to ensure the resources are allocated effectively and efficiency to achieve the best outcome. Contracting with other institutions would be the best way for institutions to survive in the increasingly competitive market.

As such, organizational efficiency can be improved through the adjustment of organizational structure and the integration of administrative resources.

6.3.2 Human resources

The core business of higher education includes the delivery of teaching, the experience of learning and the pursuit of research. Accordingly, the quality of human capital - teaching staff - is considered a critical factor for HTVE institutions to create and sustain competitive advantage. Human capital in the educational context is referred to as the collective knowledge, experience and competence of all the staff (Maister, cited in

McAleer & McHugh, 1994). To achieve and sustain competitive advantage, HTVE institutions should manage human capital as assets built on faculty qualifications, leadership, teamwork, personnel, and job loyalty. As one interviewee [1, Board Director of private institute] argued:

Teachers are the most important resource to an educational institution. The excellent teacher acts on monitoring where each student is and what each student needs with a view to providing appropriate instruction or direction to each and every student in the room. As such, how to attract well-qualified teachers and how to maintain a trusting, confidential and supportive relationship with teachers are important managerial tasks of an institution.

Faculty qualifications

Recruiting and retaining highly qualified teachers is a top priority for HTVE institutions if they are to maintain and improve the quality of teaching within their organization. Teachers must not only be rich in knowledge, but should also make valuable contributions to existing knowledge (Madu & Kuei, 1993). As one interviewee indicated:

Teachers take on an increasingly greater degree of responsibility in the classroom as well as in the campus environment broadly perceived. In addition, teachers no longer work together only with their peers, but collaborate also with colleagues from other institutions from the same country or from abroad. They have to maintain regular contacts with parents and vocational high schools, because they are likely to affect the enrollment choices that students make.

Another respondent [22, President of private college] commented on this aspect of human resources:

Qualified faculties engage in research and scholarly activities that contribute to local and national agendas.

Another interviewee [16, President of private university] shared a similar view, stating:

Teachers are the most important resource in student instruction. Thus, having

academically and professionally qualified faculty members is a competitive advantage for HTVE institutions.

A pool of highly qualified teachers is one of the most important sources of competitive advantage for HTVE institutions. To attract and retain highly qualified teachers, institutions should reward their excellent teaching staff by providing incentives so that they can continuously meet the needs of students, employers and the government (Yorke, 2000).

Teamwork

The core concept of teamwork is to co-operate with each other. Well-functioning institutions should consist of a number of overlapping teams, comprising academic and administrative staff. Mixed teams of academic and non-academic staff have an important role to play in the operation of educational institutions (Sallis, 2002). One interviewee [1, Board Director of private institute] described teamwork as ship sailing, stating:

The principal is the captain; all department heads and directors are first and second mates, and the academic and non-academic administrative staff are the crew members. They play a role in operating and navigating the ship in order to arrive at the destination safely. Teamwork and the spirit of co-operation should be encouraged.

Another interviewee [6, President of public university] claimed:

Institutions can't rely on individual effort but all members' commitments to complete the required tasks with the spirit of teamwork.

Teamwork is necessary in the context of educational institutions because all work is a process, with many people depending on one another to produce results. Thus, administrative units have to team up with academic faculties to obtain the best outcome.

Leadership

Presidents of HTVE institutions are the senior level decision-makers, providing leadership on issues relating to the overall operation of institutions. These leaders not only provide for the comfort and safety of students and staff, but also handle disciplinary problems, budgetary difficulties, and effective communication with parents, corporate leaders, government, university personnel, teachers, and students. As such, their character traits and behaviour have a great influence on school culture, policies and performance (Demoulin & Kendall, 1993). One interviewee [2, Senior Specialist of Ministry of Education] claimed:

Presidents decide the allocation and integration of the variety of school resources. They make decisions carefully based upon the market trends and dramatic changes.

A similar comment was made by another interviewee [24, President of private institute]:

Presidents, as group leaders, must have broad vision and horizon in order to lead the institution to achieve competitive advantage.

Nearly half of the interviewees thought that the professionalism of presidents could affect institutional performance. For example, one respondent [28, President of private institute] commented:

If presidents, for example, are nominated as consultants by the industry or government sector, their professionalism acts as an extra value to enhance the reputation of the institution in the HTVE sector.

The president is considered a significant factor in determining school success. Effective leadership must be spread across an institution, in faculties, in departments, among academic and non-academic administrative staff, as well as in top management. The success of an institution can only be achieved through effective leadership across the institution, particularly at department level (Shattock, 2003).

Personnel

An educational institution is just like any other business enterprise. Its success relies on hiring highly qualified staff and putting the right people with the right skills in the right positions to build a committed workforce. As indicated by one interviewee [9, President of public university]:

Personnel staffing is positively related to institutional performance. To achieve the best outcome, it is important for HTVE institutions to have the right people, in terms of qualification, competence, ability and potential, in the right place at the right time.

Another interviewee [30, President of private institute] explained:

The quality of HTVE is dependent on the staffing system of HTVE institutions. This system fosters the operation and management of administrative units.

Matching the right person to the right position is an acknowledged imperative for HTVE institutions. Every teacher needs to be assigned to a position that fits their expertise and allows them to perform to the best of their abilities.

Job loyalty

Many of the interviewees expressed their belief in the importance of staff loyalty to the institution, in addition to their commitment to teaching, research and service to the community. One interviewee [22, President of private college] claimed:

Academic staff must realize the mission of the institution and be professional in their fields. Non-academic staff should be dedicated and responsible. In this way, the level of loyalty toward the school can be formed and enhanced.

Another interviewee [23, President of private institute] noted:

The loyalty of the academic and non-academic staff needs to be spread out to all its students. Only if all members have high loyalty toward the institution, will they be devoted themselves entirely to school development and prestige.

Job loyalty occurs when commitment to the institution is high. By investing in its staff a HTVE institution will enjoy the benefits of higher morale, higher job loyalty and reduced turnover.

6.3.3 Financial resources

HTVE institutions must have sufficient and available financial resources to fulfil their commitment to students and staff. Effective management of financial resources ensures the future of the institutions and involves three basic financial management activities: safeguarding the financial assets of the institution; maintaining an appropriate internal control structure; and budgeting and monitoring expenditures. Several comments were made by interviewees to illustrate this point, including:

Financial resources are the basis for the operation of an educational institution. The lack of financial resources makes its goals impossible to achieve. [11, President of public college]

Perhaps the most difficult task for HTVE institutions is to explore diverse funding sources. This is particularly important for private HTVE institutions given that tuition fees are the major financial resources. However, another point worth emphasizing is that the success of an institution not only relies on the sufficient financial resources but also the appropriate use of the money, making suitable long-term investments. [10, Vice President of public university]

A range of issues in relation to financial resources for HTVE institutions will be discussed in depth in the following section.

Sufficient financial capital

An institution of higher education is unlikely to survive without sufficient financial capital. This is particularly important for a newly established institution. One interviewee [2, Senior Specialist of Ministry of Education] noted that:

It is hard to ensure sufficient financial resources are available and HTVE institutions need to be prepared for a continuous five-year loss of money.

Another interviewee [32, President of college] expressed a similar view:

It is important for an institution to be equipped with substantial financial capital and stable financial income. There are several privately-owned schools whose board committees are famous business enterprises. A large amount of financial resources are used to support the operation of an institution. Accordingly, its reputation would be better.

The institution's financial resources play a key role in sustaining the achievement of its educational objectives and in furthering institutional improvement now and in the foreseeable future.

Financial planning and budgeting

The purpose of financial planning and budgeting is to ensure that the money invested in the institution is properly used and allocated. Comments were made by more than three-quarters of the interviewees emphasizing the importance of financial planning and budgeting before financial implementation is considered. Some illustrative comments include:

Owing to the limited financial budgets, it is important for institutions to set the priority for any investments. [1, Board Director of private institute]

Institutions need to have both mid- and long-term financial plans reviewed and approved by the committee. [32, President of private college]

Budget planning is essential to financial success. Financial planning and budgeting should occur on an ongoing basis, should be realistic, and must be based upon the mission and vision of the institution.

Financial implementation

Building a system to implement financial planning and budgeting is very important. One respondent (2, Senior Specialist of Ministry of Education) reported:

Several privately-owned schools used to suffer serious financial problems such as the misuse of budgets or failure in investments. The teaching rights of academic staff, the student's rights of being taught, and the working rights of non-academic staff are seriously hurt. [24, President of private institute]

Another respondent [14, President of private university] added:

The finance system should be further rationalized and made more transparent in order to achieve sustainability.

Nearly all interviewees suggested that the achievement and maintenance of a stable financial system is a top priority for most HTVE institutions in Taiwan.

6.3.4 Physical resources

The quantity and quality of physical resources owned by HTVE institutions was considered important because “*students might not be able to tell how good or bad the teaching quality is, but feel that the physical infrastructure is being improved*” [32, President of private college]. This is consistent with Price, Matzdorf, Smith and Agahi (2003) who claimed that the quality of campus facilities is perceived as having an important influence on students' choice of institution.

Campus location

More than half of the interviewees indicated that campus location was one determinant of competitive advantage for HTVE institutions. One particular statement was very clear on this issue: “*the right location attracts more students and ensures the revenues of the institution*” [5, President of public university]. Another interviewee [6, President of public university] who had similar thoughts, said:

The location of an educational institution might influence its future prospect of growth. A good location attracts not only more students but also excellent teaching staff.

Location could certainly prejudice prospective students, particularly in relation to job prospects to support their study. One interviewee [17, Vice President of private university] explained:

This is particularly important for a private institution, because its tuition fees are often higher than the public one. Only an institution nearby major metropolitan areas has more part-time working opportunities available to students. Students are able to get a part-time job and earn extra money for their tuition.

The difficulty of obtaining sizable pieces of land in metropolitan areas has resulted in several newly established institutions locating themselves in less than attractive locations. One interviewee [5, President of public university] remarked on the importance of an appropriate campus location:

Some recent achievements and successes of our university are attributable to its location in Taipei Metropolitan Area. If our university was located in the remote areas, such as the east or south of Taiwan, there would be no such prospect of growth.

The location of the campus plays an important role in motivating students to enrol. HTVE institutions in small communities (e.g. suburban areas) will not be able to offer as many off-campus activities as those institutions situated in large cities (e.g. downtown areas).

Campus facilities

Although it is difficult to change the location of a campus, institutions can make efforts to improve physical facilities and the technological infrastructure to counteract the negative effect of campus location and to create a modern learning environment. As one interviewee [29, President of private institute] stated:

Students can directly feel the changes of physical surroundings and facilities, given the addition of leisure facilities, such as swimming pools, gyms.

Another interviewee [11, President of public institute] commented:

Students can have a sense of the improvement of physical equipment and facilities, since they are tangible and visible in nature.

One interviewee [7, President of public university] gave an example:

Our university is located in a remote location. In order to overcome this physical constraint, we invested in a campus fibre optics network and technology infrastructure. Equipped with such high performance computer network, we are able to obtain the latest information about the external world. The so-called 'E-campus' is what we are proud of.

Appropriate campus facilities can foster a strong sense of community among students, academic and non-academic staff, and meet a variety of specific needs for shared space. When examining the relationship between campus facilities and student performance, one interviewee [18, President of private university] stated:

The enrichment of student-life experiences is complemented by a variety of excellent facilities and services. The well-designed campus could not only help students develop their humanistic literacy but enrich their entire collegiate experience.

Students may use campus facilities and take an active part in campus events. Thus, a variety of physical facilities and technology infrastructure should be built to enrich student life on campus.

Teaching and research infrastructure

For HTVE institutions, investment in teaching and research infrastructure is strategically important in seeking a competitive advantage. Such infrastructure includes lecture rooms, laboratories, library and electronic resources, among many other assets. As expressed by one interviewee [11, President of public college]:

Having modern classrooms and well-equipped laboratories not only improves teaching effectiveness, but also enriches the educational experience.

This is particularly important for HTVE institutions aiming to improve their academic reputation. Another interviewee [17, Vice President of private university] noted that:

Research-aided equipment, such as access to library resource and on-line databases, is the way to encourage and support faculty staff to undertake teaching and research projects.

Teaching and research infrastructure must be maintained in order to ensure that students and teachers have access to good learning and teaching conditions (Madu & Kuei, 1993). For example, teachers should be able to get the information they need in a timely manner. The necessary teaching materials, professional journals and major books should be available in the library. In the classroom, different types of teaching aids must also be available and in operational condition.

6.3.5 Marketing capabilities

Higher education institutions seeking to attract students should develop a marketing plan to emphasize how they can provide prospective students with the best programs and services. University/college publications, senior/high school counselors, university/college alumni, and commercial guidebooks should be provided with complete information regarding the institution's ability to meet student needs (Discenza, Ferguson and Wisner, 1985). Recently, a large number of HTVE institutions in Taiwan have adopted a range of marketing strategies to enhance public awareness. These strategies include media promotion and participation in all kinds of off-campus activities and events. In addition, some institutions have offered a variety of scholarships and tuition waivers to attract excellent students when the enrolment dates are approaching. Strategic alliances with vocational high schools and partnerships with other higher education institutions are considered low cost alternatives to traditional media and public relations marketing.

Media promotion

The use of media to promote educational institutions is not new in Taiwan. A number of private HTVE institutions have spent both time and money on promotional activities, producing positive results. Through media channels, institutions are able to show the public the current stage of their development and their future mission and vision. One interviewee [2, Senior Specialist of Ministry of Education] explained:

The use of media is considered as an effective marketing strategy. The mass media allows the public to better understand what the school has done so far and what it is going to do in the future. The success of Southern Taiwan University of Technology, one of the high performing private institutes, has demonstrated the power of media.

Several comments made by interviewees also highlighted the importance of marketing communications, such as:

HTVE institutions can use all kinds of communication channels to let the public know its students' superior academic performance and extracurricular achievement. For example, holding a press conference to publicize the institution's goals and achievements is considered to be the most cost-effective. [27, President of private institute]

Traditional print advertising and modern mass media are both effective means of broadcasting information to prospective students in a short period of time. There has always been a positive relationship between exposure effect and recognition memory. As a prospective student, he/she will want to know more about the history of the institution. Thus, institutions with high exposure rates are more likely to be selected. [7, President of public university]

However, another respondent [23, President of private institute] cautioned:

Marketing is unlikely to guarantee the long-term sustainability of HTVE institutions, because of the nature of an educational institution as non-profit organization.

HTVE institutions use mass media to let the public understand their goals and missions. This is considered by nearly all interviewees the most cost-effective way to strengthen the brand awareness and reputation of the institution.

Scholarships and financial aids offered

Tuition fees are an important and common concern for students when choosing their institutions. The majority of students seem to enrol at an institution that charges low tuition fees (Sohail & Saeed, 2003). Thus, scholarships and financial aids are seen as part of a wider marketing strategy to attract outstanding students. One interviewee [5, President of public university] argued:

Spending money on attracting good students to study has been recognized as the most powerful strategy, although it could be a short-term strategy.

Another interviewee [8, Dean of Academic Affairs of public university] made a similar observation:

Currently, there are a number of institutions offering scholarships and financial aids to draw students' attention to enrol in their degree programs. In the short term, the enrolment rate has improved as expected.

Offering scholarships and financial aids to attract outstanding students is a commonly used and effective marketing tactic across HTVE institutions.

Participation in off-campus activities and events

Educational institutions need effective communication with their markets and the general public. Participating in off-campus activities and events has proven to be a valuable communication channel to distribute information to potential students, families and peers (Sohail & Saeed, 2003). Such activities and events could range from academic (e.g. workshops, seminars, conferences, education fairs, etc) to non-academic (sports-related competitions, community relations etc). According to more than half of the interviewees, HTVE institutions should be actively involved in off-campus activities and events as this is a means of communication between institutions and their primary customers. As one interviewee [2, Senior Specialist of Ministry of Education] explained:

Participating in off-campus activities and events, both academic and non-academic related, are the cost effective way to let the public know more about the institution and to increase exposure to mass media.

Another interviewee [28, President of private institute] added:

HTVE institutions could increase their market exposure and awareness through hosting or participating in sport-related events. For example, students in our university won more medals, more team championships and participated in more competitions than before. Collectively they enhanced substantially the name recognition of our university in this field. This is a cost-effective way of marketing our university.

For HTVE institutions, participation in off-campus activities and events is a cost-effective way to promote themselves. It has strategic value for HTVE institutions in terms of enabling them to inform their primary customers of their outstanding academic and non-academic achievements.

Strategic alliances with vocational high schools and partnerships with other high educational institutions

A strategic alliance is an agreement in which two or more organizations work together to pursue a set of agreed upon goals while remaining independent of each other. For HTVE institutions, strategic alliances focus on feeder institutions (vocational high schools), and other institutions of higher education. As one interviewee [2, Senior Specialist of Ministry of Education] noted:

The formation of strategic alliances between institutions is considered good news for both students and staff alike. Institutions may combine their efforts in sharing knowledge, expertise, and resources as well as in gaining entry to new markets. The creation of a strategic alliance may turn actual or potential competitors into partners working toward a common goal.

Another interviewee [1, Board Director of private institute] explained:

To form strategic alliances, the institution should emphasize the importance of personal contact as a way to build and maintain close relationships with potential co-operative partners (e.g. vocational high schools). For example, the admission representatives from the institution should visit a particular vocational high school

to promote awareness of itself as a leader in providing HTVE and to attract the attention of its students with high quality.

Strategic alliances and partnerships have become important aspects of survival and growth. They have grown dramatically over the past decade, and will continue to increase in the HTVE context. It is reported that the most common forms of strategic alliances are resource sharing, course sharing, and co-operation on academic research (Lee, 2007).

6.3.6 R&D capabilities

While the major product HTVE institutions offer is the diversity of their curriculum and degree programs, R&D was highlighted by nearly all interviewees as an important internal resource in sustaining competitive advantage. Major elements for effective R&D were the ability of HTVE institutions to offer comprehensive and high quality curriculum and to secure large research projects from the government and from private business enterprises.

Curriculum design

Curriculum is the core product offered by HTVE institutions. Therefore, how to distinguish one educational institution from another is dependent on the design of its curriculum programs (McPherson & Schapiro, 1998). Curriculum design should take into consideration aims and objectives for teaching and learning, intended learning outcomes, syllabus, learning and teaching methods, and performance assessment. Comments from interviewees on this point included:

Well-designed curriculum can provide the distinctiveness of the institution. [24, President of private institute]

The design of curriculum should be linked with practical teaching and co-operating with the kinds of industries in order to ensure students are qualified, meeting the industry requirements. [2, Senior Specialist of Ministry of Education]

The so-called sandwich method in teaching needs to be promoted. It helps students gain more professional knowledge and practical experiences before entering the employment market. [11, President of public college]

Nearly all interviewees claimed that HTVE institutions have become more focused on the employability of their graduates. Thus, incorporating a practical component in the curriculum can create differentiation and distinctiveness.

Curriculum quality

While HTVE institutions aim to provide better education to students, the quality of products and services they offer needs to be continuously monitored and reviewed. A range of comments made by nearly two-thirds of the interviewees revealed that high quality curriculum is another driver of competitive advantage for an educational institution. These comments included:

The quality of curriculum can foster the first-level students. It is important to review the appropriateness of the curriculum through the comments of students, alumni, and business enterprises in related industries [14, President of private university].

The quality of curriculum must be controlled carefully by the curriculum committees so that the quality of student learning can be ensured [13, President of private college].

It is noteworthy that nearly two-thirds of the interviewees highlighted that high quality curriculum maintained by HTVE institutions allows their students to enjoy great career success and unmatched personal development.

Range of majors and degree programs

HTVE institutions aim to prepare students for employment and ensure they have the skills and knowledge the industry sector requires. Thus, HTVE programs must reflect industry trends. While industry developments continue to require changing skills and knowledge, the range of majors and degree programs should be broadened and

diversified to be more flexible and appeal to a wide-range of target markets. As indicated by one interviewee [24, President of private institute]:

When facing fierce competition, institutions need to be more flexible by not only offering HTVE but also long-distance education and adult education.

Another [7, President of public university] commented:

Due to the decrease in the number of vocational high school students, institutions need to work harder to broaden their markets by both offering adult and long-distance education and attracting international students to promote internationalization.

As such, HTVE institutions must be flexible to support a wider range of majors and degree programs to meet the full range of student needs. This is consistent with Joseph and Joseph's (2000) argument that educational institutions need to explore other approaches for continuous growth and sustainability. HTVE institutions could extend product offerings, such as professional development courses for executives and long distance education for international students. These strategic options enable institutions to access a larger share of the HTVE market.

Collaboration with private business enterprises

Students graduating from HTVE should be ready to enter the workforce. Therefore, their capacity to work independently should be ensured. A range of comments made by the interviewees placed emphasis on the needs of industry-academia collaboration to cultivate students with professional skills and knowledge. These comments included:

It is necessary to establish internship programs with business enterprises [30, President of private institute].

If institutions could have more interaction with the industry sector and exchange ideas, they will understand what kinds of employees the industry is looking for, and how to educate its students to meet the industry requirements. In addition, the industry-academia collaboration can be strengthened [25, President of private

institute].

There is a need for HTVE institutions to co-operate with industry to ensure that students graduate with a “profile of their enterprise skills and qualities” (Jenkins, Scurry & Turner, 1994).

Participation in government-funded research projects

Staff participation in government research grants should be encouraged. This was noted by more than half of the interviewees as another way for HTVE institutions to build a close connection and make a greater contribution to society. One interviewee [14, *President of private university*] commented:

Institutions should encourage their teaching staff to apply for all kinds of government projects. By doing so, more funding is able to be obtained and reputation is expected to increase.

Staff participation in government research projects brings collateral benefits to the institution.

Integration of academic and research resources

More than half of the interviewees suggested that integration of academic and research resources should be recognized as one of the extraordinary capabilities of HTVE institutions. Previous research has indicated that a strong link exists between personal research and teaching (Marsh & Hattie, 2002). Therefore, academics have an obligation to link their research to their teaching in order to be considered good teachers (Brown, 2005). Although academics are not expected to pursue research in HTVE institutions, which are non-university tertiary institutions, one interviewee [7, *President of public university*] highlighted:

Research forms the basis of teaching content. Teachers who are active researchers are more likely to be outstanding in their discipline and aware of international perspectives in their field.

Another interviewee [25, President of private institute] claimed:

It might be necessary for every academic to be an active researcher for the department so that a strong research department can be developed and maintained and teaching effectiveness enhanced.

Research and teaching are interrelated and form a continuum of academic activity. Integration of academic and research resources could add more value to HTVE institutions and extend their capabilities. This view is confirmed by Brown (2005) who noted that research is concerned primarily with knowledge acquisition, whereas teaching is primarily concerned with knowledge dissemination. These activities should be integrated into the context of institutions of higher education.

6.4 Major indicators of institutional performance

The data analysis revealed that institutional performance is strongly connected to competitive advantage and can be evaluated in relation to three key variables - student, staff and institution - as summarized in Table 6-3. Further discussion is provided in Sections 6.4.1 to 6.4.3.

Table 6-3 Institutional performance indicators: themes and sub-themes

Themes	Sub-themes
Student performance	employment rate of new graduates, percentage of graduates pursuing further studies, pass rate on certificate/licensure examinations, professional knowledge and capabilities of graduates
Staff performance	staff performance in teaching, staff performance in academic research, staff performance in applied research, practical experience and skills of teaching staff
Institution-level performance	institutional culture, graduate/alumni evaluations, institutional distinctiveness, community service, holistic education development, professional curriculum development, institutional reputation, facilities management, industry-academia collaboration, magazine ranking, industry's evaluation on the quality of graduates,

These levels of achievement are deemed to be highly interrelated. According to interviewees, the competitive advantage of a certain HTVE institution can lie in its effective and efficient use of both tangible and intangible resources, as needed to support teaching and learning processes. Given favourable resource endowment, HTVE institutions will have the ability to attract staff of the highest quality. The quality of staff employed by HTVE institutions is deemed to be crucial to competitive advantage.

Given that teaching and research are the core business of HTVE, those institutions that excel in these areas are likely to attract the best students. The major task of HTVE institutions is to provide students with a high quality learning experience. Improving the student learning experience must be a top priority for institutions to advance the quality of higher education (Barnett, 1992). HTVE institutions with the highest level of performance in their core business of teaching and research are generally also leaders in their communities and provide students with a high quality learning experience.

6.4.1 Student performance

The student is on the receiving end of, and participates in, the process of education (Barnett, 1992). As the output of the educational system, students and their learning outcomes should be regarded as part of the institutional performance. The following comment is reflective of the view of nearly all interviewees:

Student performance is one of the most important indicators of institutional performance. People generally believe good schools produce good students. The success of HTVE institutions depends on how the public understands and perceives their students [2, Senior Specialist of Ministry of Education].

Student performance was deemed to be very influential in determining the competitive advantage of HTVE institutions. Indeed most evaluation or benchmarking systems in the literature include student learning outcomes as one of the indicators of institutional performance. Well-performing institutions incorporate a high proportion of outstanding students. Similarly, institutions that perform below or at moderate levels may not be able to attract large numbers of outstanding students. Student performance undoubtedly has a profound impact on the entire school and the public's perception of the school. As suggested by nearly all interviewees, four student outcome indicators emerged as being important to HTVE institutions: percentage of graduates pursuing further studies, employment rate of new graduates, pass rate on certificate/licensure exams, and professional knowledge and capabilities of graduates.

Percentage of graduates pursuing further studies

The main purpose of HTVE is to prepare students for future employment, although nowadays some students may choose to continue with graduate studies. This is because

Taiwanese society adheres to the traditional Chinese social value that ‘everything is inferior and only learning is the noblest of human pursuits’ or ‘to be a scholar is to be on top in the society’. Because of an increase in average income per household and a decrease in the number of children, Taiwan’s parents are more willing to spend their money on their children’s education. One interviewee [19, President of private university] elaborated:

Students have become ever more demanding in pursuit of their advanced degrees. The earning differential between undergraduate and graduate degrees is the most convincing evidence of the value of a postgraduate education. To encourage students to continue their education, many HTVE institutions offer scholarships to those who are admitted to public and prestige universities.

This statement reflects the belief that higher education has great economic value, which makes it essential for individuals as well as for the whole society (Kim, 2002). In Taiwan, higher educational attainment equates to higher incomes/earnings. Thus, the rate of enrolment in graduate studies has become an important indicator of institutional performance.

Employment rate of new graduates

With the transformation of Taiwan’s industry structure, HTVE institutions play an important role in producing employable graduates for various sectors and contributing to the economy and society through high quality research and innovation. McKinnon, Walker and Davis (2000) remarked that the aspiration of all higher education institutions is to provide relevant courses of sufficiently high standard to enable students to gain employment. The enhancement of graduate employability is a key issue in HTVE institutions as it reflects, in part at least, the content, skills and attitudes gained by graduates from their courses. One interviewee [1, Board Director of private institute] commented:

The mission of HTVE is to create the human resource manpower that is required for the economic development of Taiwan. It is important and desirable that HTVE institutions take into account the needs of the local employment market when designing curricula for their students.

All interviewees expressed similarly positive opinions on the importance of graduate employability and believed that a good supply of highly skilled employable graduates can contribute effectively to national prosperity. As one interviewee [29, President of private institute] summarized:

The employability of graduates is a key concern for HTVE institutions. All institutions now make strong claims about the qualities or attributes of their graduates and their employability. High employability is vital to the success of HTVE institutions.

Whether a graduate is able to get a job remains a key issue which needs to be addressed in order to reflect the fundamental objective of HTVE.

Pass rate on certificate/licensure examinations

HTVE institutions in Taiwan have long had an excellent track record of employment. However, the labour market is more competitive than before. In recognition of this trend, HTVE institutions have all placed greater emphasis on the need to foster students' skills, competencies and practical experience, in addition to subject knowledge. HTVE institutions have been making significant efforts to encourage their students to take qualification examinations to obtain occupational certificates in their respective professional fields. The following comments are typical of what the interviewees said:

The more occupational licenses or certificates a student has, the more chance he/she will have of getting a job. [29, President of private institute]

While the labour market is competitive, HTVE graduates seem to find a job more easily than university graduates because they have professional occupational certificates. [30, President of private institute]

The purpose of the occupational certificate system is to enhance opportunities for employment and students are encouraged to take qualifying examinations to obtain occupational certificates in their respective professional fields (Yu & Hsu, 2003). A certificate is evidence that the holder has attained the necessary competence for one

particular occupation. This is particularly important for those professional occupations like teaching and nursing. As one interviewee [12, President of public institute] noted:

A newer nursing graduate is considered qualified only if he/she holds a registered nurse license.

Passing rates on professional/occupational licensure examinations provides a useful indicator for evaluating student learning outcomes.

Professional knowledge and capabilities of graduates

Degree completion is one of the best ways to ensure students have a minimum level of professional knowledge and capabilities. One interviewee [12, President of public institute] expressed the views of nearly all interviewees, when he said:

Completing the curriculum ensures the students have proficiency in a particular area of knowledge as the curriculum is designed to build on students' skills and knowledge for a variety of different specializations.

Another interviewee [19, President of private university] noted:

The emphasis of HTVE is on training and developing students for professional skills and competencies demanded in today's labour market. However, in some occupational fields, no license or certificate is required to demonstrate one's qualifications. Without an occupational certificate system, a student who has successfully completed all the required coursework for a degree program is therefore considered qualified.

In a sense, successful course completion is a way of assessing the capacity of a student to work after graduation and serves as an important factor of student performance.

6.4.2 Staff performance

The educational system is a transformation system/production process consisting of “activities performed to disseminate knowledge, to conduct research and to provide community service” (Gupta, cited in Sahney, Banwet & Karunes, 2004, p.152). These

are the major responsibilities of academics in higher education institutions (Marsh & Hattie, 2002). In a knowledge-based economy, teachers have to do research in addition to teaching, and to strengthen academic-industry collaboration in order to act as a contributor of knowledge evolution (Chang et al., 2005).

Based on the comments made by respondents, the evaluation of staff performance should emphasize practical experience, collaboration with industry, and involvement in research as well as teaching.

Staff performance in teaching

Good teaching is fundamental but it is a continuing process. As one interviewee [24, President of private institute] said:

Evaluating teaching should be viewed as an ongoing process that serves a range of quality improvement and quality assurance purposes.

The best teaching is engendered where the academics are “expert, enthusiastic, skilled, and well supported” (McKinnon, Walker & Davis, 2000, p.72). Expert academics should evaluate the quality of their teaching from the point of view of the learner, because the way of teaching is associated with the quality and quantity of student learning (Ramsden, 1994).

Staff performance in academic and applied research

Staff participation in research has recently received significant attention in the context of higher education, while universities have long been emphasizing the importance of research productivity and research quality as one measure of faculty achievements and staff excellence (Madu & Kuei, 1993). Research and teaching are interrelated, forming a continuum of academic activity. A teacher’s active involvement in research should underpin the quality of his/her teaching (Brown, 2005). One interviewee [3, Director of TVE evaluation project] explained:

Undertaking academic research studies forms the basis of the content of teaching. Teachers who are active researchers are more likely to be a recognized national and international expert in their discipline and fields.

Traditionally, research productivity is assessed according to the number of research publications in high quality journals as well as the continuity of research funding acquired from possible sources (Bloedel, 2001). One interviewee [25, President of private institute] provided comments on the importance of research to HTVE:

Academic papers are in general not closely associated with the demands of business enterprises. For Taiwanese companies, a move from OEM [original equipment manufacturer] to ODM [original design manufacturer] requires knowledge spillovers from the academic sector to create innovation products. Staff participation in R&D is highly encouraged.

The nature of staff performance evaluation should not be limited to the proportion of research publications but also include the number of R&D projects undertaken.

Practical experience and skills of teaching staff

As a strong relationship is found to exist between teaching methods and the amount of student learning (Ramsden, 1994), several interviewees commented on the minimum qualifications and specialized experience requirements for academic staff. Comments included:

Technical and vocational teachers are rather different from university teachers. They need to possess a high level of professional knowledge and practical industry experience in order to educate students for employment [12, President of public institute].

Teachers with professional and practical experiences could even establish institutional distinctiveness, because they are hard to find [26, President of private institute].

Another interviewee [10, Vice President of public university] explained:

The benefits of having a minimum number of academic staff with practical experience and skills are: practical curriculum design, employment opportunities for graduates, and academy-industry collaboration.

It is evident that teaching staff with practical experience and skills can enrich student learning.

6.4.3 Institution-level performance

Taiwan's HTVE evaluation system and international media publications, such as *The Times*, *Financial Times* and *US News & World*, were the most frequently cited sources for the analysis of HTVE institutional ranking. A comparison of these evaluation models revealed that there are overlaps between the various measures of student, staff, and institution-level performance. Strong rationales for examining the institution-level performance were also given by a few interviewees. One interviewee [3, Director of TVE evaluation project], for example, indicated that:

It is not easy to measure student achievement accurately and one alternative is to examine the institution-level performance given the nature of student performance as part of overall institutional performance. This is perhaps consistent with the market perspective that an organization's performance is often determined by outcomes, rather than inputs or processes.

Another interviewee [22, President of private college] held a similar view and cautioned that:

In reality, it is hard to quantify student results, but it is easier to quantify the tangible resources and staff qualifications of an educational institution.

Based on the comments made by the interviewees, the criteria for institution-level performance measurement include: institutional culture; graduate/alumni evaluations; institutional distinctiveness; magazine rankings; community service; holistic education development; professional education development; institutional reputation; facilities management; industry-academia collaboration; and industry evaluation on the quality of graduates. They serve as a framework for describing the current status of HTVE institutions and as an indicator for measuring its competitive advantage.

Institutional culture

The culture of an educational institution informs all staff at the institution of what is truly important and how they should behave (Stolp & Smith, 1995). Institutional culture is “the set of norms, values and beliefs, rituals, ceremonies, symbols and stories that make up the ‘persona’ of the institution. These unwritten expectations build up over time as teachers, administrators, parents and students work together, solve problems, deal with challenges and cope with failures” (Peterson, 2002, p.10). In a healthy institutional culture, principals co-operate with teachers. They all have a shared vision and mission, focus on student learning, and work under a standard set of assumptions and principles. A positive culture should be linked with the vision and the mission of the institution. One interviewee [1, Board Director of private institute] stated:

A healthy culture doesn't magically occur. Strong culture emerges, in part, by the efforts of the principal, and there is nothing more visible than the work of the principal.

Another interviewee [9, President of public university] commented that:

Institutional culture plays the dominant role in exemplary performance. It is the deeper level of basic assumptions and beliefs that are shared by members of an institution.

Institutional culture is the sharing of values, beliefs, and attitudes that teachers and administrators hold about teaching and learning. It determines what all staff members consider to be normal in the institution.

Graduate/alumni evaluations

There are numerous ways to contribute to the success and competitiveness of an educational institution. A strong alumni network is one such way. Institutions should encourage the formation of any alumni associations. These associations serve as a valuable channel for the distribution of information that could influence the opinion of the families and peers of potential students (Joseph & Joseph, 2000). As one interviewee [24, President of private institute] stressed:

A strong alumnus is critical to the institution's success, because it provides a cultural pillar and the link to a heritage that is essential for continuity and the building of a strong school ethos.

HTVE institutions should strengthen links with alumni. One interviewee [6, President of public university] highlighted the importance of alumni outreach, saying:

Over the years, our university has created many excellent alumni. Many of our alumni have become leaders of major companies. Their active and successful participation in their industries has helped create a favourable reputation for subsequent generations of our graduates. These later alumni in turn have been able to gain positions as CEOs of venture businesses as well as small and medium sized companies.

Because alumni are the best ambassadors and publicists of educational institutions, strong links should be built, and alumni-institution relationships should be maintained for mutual advantage (Shattock, 2003).

Institutional distinctiveness

Institutional distinctiveness refers to “those specific attributes or factors that enable an institution to enjoy a distinctive identity or an academic profile for which the institution is known, admired, and valued” (Moore, 2005, p.1). In this sense, institutional distinctiveness will be present when the HTVE institutions develop capabilities that are unique and non-imitable. By developing distinctive capabilities that add value for students, HTVE institutions attain and sustain competitive advantage in the marketplace. One interviewee [11, President of public college] remarked that in his experience:

The sandwich courses which include an extra year of work experience 'sandwiched' between two or three years of concentrated study was firstly introduced by our institution. This is considered the school distinctiveness.

Some interviewees commented on the perceived importance of institutional distinctiveness as an indicator of competitive advantage, as highlighted by these two respondents:

Institutional distinctiveness can be a competitive advantage for HTVE institutions.

[11, President of public college]

Differentiation creates perceived extra value in the eyes of the customers, and thereby establishes the institutional distinctiveness required for survival. [26,

President of private institute]

Pursuing institutional distinctiveness provides the institution with an opportunity to think more innovatively about its strengths, which may have been taken for granted in the past. Most institutions have cultivated their distinctiveness through achievement and maintenance of academic position and reputation, such as pedagogy, graduate education and research, public service and engagement, and disciplinary or multi-disciplinary excellence (Moore, 2005). In order to escape competition and reduce the potential for imitation, “*any special programs should be housed within the department. HTVE institutions should define themselves as unique by emphasizing their particular programs or unusual characteristics.*” [20, President of private university]

Many HTVE institutions have recognized that they are unable to compete successfully unless they are perceived as worthy of the public’s trust and confidence. An institution’s ability to earn public support is highly dependent on whether it possesses distinguishing attributes and characteristics that are valued and respected in the higher education market (Moore, 2005).

Community service

Incorporating community service experiences into students’ school life has long been viewed as necessary to foster socially responsible attitudes in students and to empower them to help create a better world. Community service is service-learning, placing “curricular concepts in the context of real-life situations” and “empowers students to analyze, evaluate, and synthesize these concepts through practical problem-solving” (Alliance for Service-Learning in Education Reform, 1993, p. 71). As one interviewee [10, Vice President of public university] indicated:

Community service is an integral part of the students’ lives at our institution.

Students learn that they can make a difference through their actions.

Another interviewee [7, President of public university] commented:

Community service participation extends student learning into the community and helps to foster a sense of caring for others.

Community service is a crucial part of a well-rounded higher education. Participating in community service at HTVE level provides students with the opportunity to understand the importance of service to others as a fundamental aspect of being a member of society.

Holistic education development

HTVE institutions with ambition to create competitive advantage should emphasize holistic education, in addition to career-oriented training. Holistic education is based on the premise that individuals seek self-identity, meaning, and purpose in their life by connecting themselves to the community and to the society (Miller, 1997). One interviewee [15, President of private university] explained:

Holistic education focuses on experiential learning and places emphasis on the values of human actions and interactions within the learning environment.

This is especially important in the context of a rapidly changing employment market. Another interviewee [16, President of private university] expressed similar views to nearly half of the interviewees about the need for HTVE students to undergo holistic education, saying:

Students need to develop the abilities to communicate with people, to work under pressure, and to develop self-management, and to work in a team. If students have the high plane of dignity and discipline, a school's reputation will be enhanced.

Another interviewee [15, President of private university] stated:

The holistic education curriculum should be structured to encourage students to integrate knowledge and build a coherent course of study. The amount of professional knowledge and skills a student has can be assessed quantitatively.

However, the extent to which holistic education affects the future of a student is hard to examine.

The purpose of holistic education is to develop a ‘whole’ individual who is capable of dealing with the academic, professional and non-professional challenges of life.

Professional curriculum development

The primary purpose of HTVE is to prepare students for employment in specific professions. As such, the institution must always keep remembering that the main objective of HTVE is to develop the specific skills and competencies needed to enter or advance in a vocation. Nguyen, Yoshinari & Shigeji (2005) suggested that institutions should strengthen student’s professional knowledge and competencies through the improvement of their curriculum design. One interviewee [12, President of public institute] noted:

Consistent with the institution’s mission, the four-year curriculum is often divided into fundamental and advanced levels. The first-year curriculum focuses on the fundamental subjects and is designed to foster the acquisition of soundly-based knowledge and skills. The core subjects are offered in the second and third year to help students build expertise in specific areas. In the final, fourth year, the advanced and specialized subjects are taught to strengthen students’ professional knowledge and to develop their practical skills.

Another interviewee [31, President of private institute] emphasized that:

HTVE must draw its content of study and the educational experience it provides from analysis of occupations. This has been perhaps the major distinguishing feature of effective technical and vocational programs. Techniques for the job analysis of many occupations must be developed, and advisory groups drawn from experts in a given occupation must be consulted.

The function of HTVE is to enable students to achieve excellent results ready for employment. The fulfilment of this function will depend largely on the curriculum development that helps students develop capacities.

Institutional reputation

A good reputation is not a “happenstance outcome” (McKinnon et al., 2000). In educational services management, institutional reputation is used extensively as a means of influencing students’ choice of a higher education institution (Nguyen & LeBlanc, 2001). Nearly all interviewees shared a similar view that institutional reputation is vital to the survival of HTVE institutions, as explained by one respondent [9, President of public university]:

Institutional reputation is a mirror of the institution’s history that serves to communicate to its target groups the quality of its products or services in comparison with those of its competitors. Once established, institutional reputation and brand image may be difficult to change.

Institutional reputation has a direct impact on student applications and thus on financial security, on relations with industry, commerce and employment, and on fund-raising (Shattock, 2003). In a sense, “a strong reputation creates a competitive advantage” [20, President of private university]. Several interviewees shared their opinion on how important reputation is for HTVE institutions, such as:

A public HTVE institution has a better reputation and gets more positive feedback from industry and society than private ones because of academic merit and the intellectual contributions it has made to industry and society. [27, President of private institute]

University reputations and image are better compared to HTVE institutions because of their histories. [30, President of private institute]

Institutional reputation is built over years by its current students and successful graduates. Institutions with good reputations are able to attract students and faculty easily. Reputation is both assessable and manageable (McKinnon et al., 2000), although it is “often rather abstract and hard to be quantified” [6, President of public university].

Facilities management

The role of physical facilities and infrastructure in supporting institutional performance and competitive advantage has been widely acknowledged (Beynon, 1997; Flemining & Storr, 1999; Price et al., 2003). This was supported by interviewees. For example, one interviewee [28, President of private institute] claimed:

Buildings as well as the site that surround them and the furniture inside are designed to accommodate the specific functions of the institution, including receiving lectures, discussions, discovery and individual learning. As such, the effectiveness of physical facilities and infrastructure of the institution delivering educational services needs to be regularly assessed.

Another interviewee [24, President of private institute] noted:

Given great importance to the physical facilities and infrastructure, the design needs to be functional, economic, structurally sound and attractive.

Quality physical facilities and infrastructure improve student motivation and aid the work of teachers (Beynon, 1997). Therefore, investment in physical facilities and infrastructure can not only improve an institution's operating efficiency but also meet growing user expectations.

Industry-academia collaboration

Institutions of higher education are now increasingly facing constrained research budgets and pressure to move towards more readily applicable research (Hall, Link & Scott, 2001; Chen, 2006). When considering the solutions to these problems, one interviewee [24, President of private institute] pointed out that:

HTVE institutions should be actively engaged in joint R&D projects with business enterprises.

More than two thirds of the interviewees remarked that industry-academia collaboration can lead to several benefits. For example, one interviewee [7, President of public university] said:

HTVE institutions should co-operate with industry in order to provide students with research-led, industry relevant courses and practical training.

One third of the interviewees commented that industry-academia collaboration is considered beneficial to HTVE institutions, giving them exposure and recognition within industry. The following comment is typical of what the interviewees said:

Industry-academia collaboration is the key characteristic that differentiates between HTVE institutions and academic universities. [10, Vice President of public university]

However, according to Tsay and Chu (2004), academic staff prefer to devote themselves to working on readily publishable papers, which can have little to do with the practical problems of business enterprises. One interviewee [24, President of private institute] thought that this challenge could be overcome by evaluating staff performance on the basis of industry-academia collaboration research. He said:

It would be desirable to use the number of co-operative industry-academia projects and the budget of a particular project as an indicator to evaluate staff performance. The number of co-operative projects refers to the breadth of the institution's service, whilst the budget of a particular project implies the depth of the institution's service.

Over half of the interviewees were of the view that the more co-operative projects obtained from industry, the more practical knowledge and skills the academic staff can have, the institution will be more competitive. Industry-academia collaboration allows students to have some experience related to their majors. It also allows the small and middle sized enterprises to engage in creativity, innovation and entrepreneurship (Dalyan, 2004).

Magazine ranking

The magazine rankings of higher education institutions have now become an essential part of Taiwan's higher education marketplace and receive an increasing amount of public attention. Such rankings are likely to affect the subsequent recruitment of

students, the perception of employers, the job placement of graduates, and the pool of alumni donors (Siemens, Burton, Jensen & Mendoza, 2005). As commented by one interviewee [27, President of private institute]:

The main purpose of the ranking of HTVE institutions is to reflect the attractiveness of each institution in the eyes of prospective students.

Another interviewee [22, President of private college] claimed:

Favourable rankings can further enhance the national/international reputation of the institution.

Mass higher education systems require some way of creating distinction between hundreds of institutions, and assessing their individual strengths and weaknesses (Shattock, 2003). One interviewee [10, Vice President of public university] felt that the most effective way of doing this is “*by creating league tables that rank HTVE institutions according to various criteria. They offer a ‘fair’ approach to assessing school success*”.

Industry’s evaluation on the quality of graduates

Another factor that determines the success and competitive advantage of HTVE institutions is the satisfaction of employers with a new graduate’s work. Many business enterprises expect institutions to produce employable graduates who are able to work independently and immediately without heavy on-the-job training (Nguyen, et al., 2005). The interviewees provided a number of explanations for why employer perceptions of graduates’ abilities are important. Nearly half of the interviewees highlighted the importance of positive employer assessments of graduate employees and their ability to satisfy industry expectations. The following comments provide some examples:

A HTVE institution will have a competitive advantage when its graduates have the knowledge, skills, and behaviours needed by industry and expected by employers [11, President of public college].

A competitive advantage can result from fresh graduates who are highly rated by their employers [5, President of public university].

This is particularly important when employers become more selective about which universities they target (Shattock, 2003). One interviewee [7, President of public university] further commented:

Only those public institutions with a long history and national presence are fortunate to attract a high number of prestigious companies that come on campus to recruit, because their graduates' job performance has been satisfactory over the past years.

Therefore, the extent of employer satisfaction with the performance of graduates/alumni is one measure of institution-level performance.

In summary, institutional performance can be assessed according to the three levels of achievement: student, staff and institution. These findings concur with Cameron's (1978, p.614) nine factors of institutional performance indicators across the assessment of student performance (e.g. student educational satisfaction, student academic development, student career development and student personal development); of staff (e.g. faculty and administrator employment satisfaction, and professional development and quality of the faculty); and of institution-level performance (e.g. systems openness and community interaction, the ability to acquire resources and organizational health).

6.5 Summary

This chapter has discussed the findings of stage one of the research incorporating in-depth interviews conducted with key informants. Elements determining the competitive advantage of HTVE institutions derived from the external industry structure and internal resources were identified through these interviews. Indicators for the assessment of institutional performance were also generated. While some of the elements and indicators of competitive advantage are universal and have been identified in the existing literature on strategic planning of educational institutions, most of them are new and sector-specific (e.g. HTVE sector) and reflect the specific characteristics of the research context, Taiwan.

The findings of the qualitative research formed the basis for the development of the survey that was conducted in the next stage of this research. The results of this next stage are presented in Chapter Seven.

CHAPTER 7: QUANTITATIVE RESEARCH RESULTS

7.1 Introduction

In the previous chapter, the findings of the qualitative research phase were presented and discussed. This chapter presents the analysis of quantitative data gathered via a survey of senior managers of Taiwan's HTVE institutions. The chapter comprises six main sections. Section 7.2 describes the response rate. Section 7.3 provides a profile of the sample. Section 7.4 identifies the factors that determine and measure the competitive advantage of HTVE institutions. Section 7.5 identifies the types of strategies used by HTVE institutions. In section 7.6, the results of the testing of the hypotheses are presented. Finally, the reliability and validity of the results are examined in Section 7.7.

7.2 Response rate

A total of 480 questionnaires were distributed, from which 323 usable questionnaires were obtained, giving an effective response rate of 67%. The major reasons that could explain this high response rate are: i) letters of introduction from the Director General of Technical and Vocational Education and from the president of the researcher's own institution were attached; ii) the professional presentation of the questionnaire; iii) covering letters explained the contribution of this study to the HTVE sector in Taiwan; iv) thorough pre-test interviews with senior managers of HTVE institutions were conducted; and v) follow-up telephone calls were made. In addition, the high response rate may be indicative of the interest respondents have in the research topic.

7.3 Profile of respondents

Table 7-1 illustrates the profile of respondents. The sample comprised mainly presidents, vice-presidents, deans of student affairs, deans of academics, deans of general affairs, and deans of R&D, while the 'other categories' consisted of secretaries to presidents, or assistants to deans. Presidents accounted for 16.4% of the respondents in the survey. Vice-presidents, deans of student affairs, deans of academics, and deans of R&D accounted for 9%, 18.6%, 19.8% and 16.1% respectively. The remaining groups were 'other categories', which accounted for 5%. Nearly 76 % of respondents were aged between 41 and 60 years old.

Table 7-1 Profile of respondents

Demographic characteristics	Category	Total	Percentage (%)
Age groups	less than 40 years	43	13.3
	41-50 years	136	42.1
	51-60 years	112	34.7
	More than 60 years	32	9.9
Years in educational administration field	less than 6 years	70	21.7
	6-10 years	87	26.9
	11-15 years	49	15.2
	16-20 years	36	11.1
	21-25 years	25	7.7
Length of working experience in the present institution	More than 25 years	51	15.8
	less than 6 years	129	39.9
	6-10 years	55	17.0
	11-15 years	47	14.6
	16-20 years	35	10.8
Positions	21-25 years	20	6.2
	More than 25 years	31	9.6
	President	53	16.4
	Vice-president	29	9.0
	Deans of academics	64	19.8
	Deans of student affairs	61	18.9
	Deans of general affairs	47	14.6
Deans of R&D	52	16.1	
Types of institution	Others	17	5.3
	University of technology	86	23.6
	Institute of technology	195	60.4
	College	42	13.0
	Public	62	19.2
Total number of students /institution	Private	261	80.8
	less than 3,000	48	14.9
	3,001-6,000	51	15.8
	6,001-9,000	80	24.8
	9,001-12,000	94	29.1
	12,001-15,000	33	10.2
Location in Taiwan	More than 15,000	17	5.3
	North	125	38.7
	Middle	68	21.2
	South	118	36.5
	East	12	3.7

In terms of the length of working experience in the educational administration field, 87 (28%) of the respondents had 6-10 years experience; 70 (21.7%) had less than six years experience; 51 (15.8%) had more than 25 years experience; 49 (15.2%) had 11-15 years experience; 36 (11.1%) had 16-20 years experience; only 25 (7.7%) had 21-25 years experience. These results indicate that more than three-quarters of the respondents had extensive educational administration experience.

One-hundred and twenty-nine respondents (39.9%) had less than 6 years working experience in their present institution; 55 (17.0%) of the respondents had been working for their current institution between 6 to 10 years; 47 (14.6%) had been working for

their institution for 11 to 15 years; 35 (10.8%) had been working for their institution for 16 to 20 years; and 51 respondents (15.8%) had more than 20 years working experience in their current institution. These results indicate that more than one-third of the respondents were relatively new to their current institutions, having been employed there for less than six years.

A total of 261 respondents (80.8%) were employed in private institutions with 60 (23%) at university level, 168 (64.4%) at institute level, and 33 (12.6%) at college level. A total of 62 (19.2%) respondents were employed in public institutions with 26 (41.9%) at university level, 27 (43.5%) at institute level, and 9 (14.5%) at college level.

The total population of students at these institutions was also requested. A total of 29.1% of respondents were employed in institutions with enrolled student numbers in the range of 9,001 to 12,000; and 24.8% were in the range of 6,001 to 9,000 students. Respondents working in institutions with student numbers between 3,000 and 6,000 people, less than 3,000 people, between 12,001 and 15,000 people, and more than 15,000 people accounted for 15.8%, 14.9%, 10.2%, and 5.3% respectively. These results indicate that the structure of Taiwan's HTVE sector is dominated by a large number of small- to medium-size institutions and very few large-size institutions.

Among the entire sample consisting of 323 senior managers, 125 respondents (38.7%) were from institutes located in North Taiwan; 118 (36.5%) were from South Taiwan; 68 (21.1%) were from Central Taiwan; and 12 (3.7%) from East Taiwan.

7.4 Factor analysis

Principal Component Analysis (PCA) was performed to identify the underlying factors in the three major aspects of the competitive advantage model for HTVE institutions in Taiwan. These major aspects are: external industry structure; internal resources; and institutional performance. The purpose of PCA is to obtain a relatively small number of factors that can account for the variability found in a relatively large number of variables. This procedure, typically performed when a researcher does not want to include all of the original variables in analyses but still wants to work with the information that they contain, is called data reduction. Differences between Exploratory Factor Analysis (EFA) and PCA arise from the fact that the two are based on different

models (DeCoster, 1998). In particular, PCA may be used to detect scale factorality; to reduce the number of variables by grouping items into several key factors; and to explore the relationship between the items (Zikmund, 2000).

The results indicated that the data were suitable for factor analysis as Barlett's test of sphericity was significant at a 0.000 level. Also, the KMO measure of sampling adequacy was 0.873 and as this value is above the acceptable level of 0.60, it is indicative of a satisfactory factorability. The sample of 323 used in this study is adequate (Comrey & Lee, 1992; Hair et al., 1998; Tabachnick & Fidell, 2001), thereby offering the prospect of producing a reliable factor analysis.

Several methods are suggested for determining the number of factors to be retained. Firstly, an Eigenvalue above 1.0 is the most common measure used. Eigenvalues represent the percentage of variance explained by a given factor. Secondly, rotation is conducted to simplify the factor structure and enhance more information for factor interpretation. The Varimax approach was used to maximise the simplification of the columns of the factor matrices. The objective of the rotation was to achieve a clear separation of the factors and to identify the variables most representative of these factors. As indicated by Turner (1991), the purpose of rotating the factors around the origin is to increase the 'fit' of the factors to groups of variables.

Hair et al. (1998) noted that variables with factor loadings greater than 0.3 are considered to meet the minimum level; loadings of 0.4 are considered more important; and loadings of 0.5 or greater are considered practically significant. In addition, if only two variables load highly on a factor, the factor was assessed as reliable, if (i) they are considered to be highly correlated with each other; and (ii) relatively uncorrelated with the other variables. For the purposes of this study, variables with low loadings on the factors, that is smaller than 0.60, were eliminated from the analysis interpretation. Also, factors with less than two variables were regarded as unreliable and were removed from further consideration. Thus, the final analysis focused only on the factors that were defined by two or more variables with factor loadings of 0.6 and above, and for which interpretation was clear.

As the aim of this research is to study the relationships within a theoretical model, the analysis focused on the variables in relation to external industry structure, internal resources, and institutional performance. Variable selection depended on the factor under study. The external industry structure factor analysis matrix contained 16 variables; the internal resources factor analysis matrix also comprised 25 variables; and the institutional performance factor analysis matrix contained 19 variables. Once the factors were extracted, each was calculated for its consistency using Cronbach's alpha to assess the reliability of a factor structure. As noted by Hair et al. (1998), the generally agreed upon lower limit for Cronbach's alpha is 0.70; although it may decrease to 0.60 in exploratory research. In this study, the factor is considered as acceptable if the value of Cronbach's alpha for a factor is greater than 0.6.

The results of factor and reliability analyses for the three factors are presented and discussed in the following sections.

7.4.1 Factor analysis for external industry structure

For the external industry structure factor analysis matrix, the un-rotated factor solution produced five factors with Eigenvalues greater than 1. The rotated component matrix indicates that five factors account for 55.1% of total variance, with the first factor responsible for a total of 18.7%. As illustrated in Table 7-2, the factors consist of variables with significant factor loadings of 0.60 or above. Since the variables load significantly on the factors that are defined by two or more variables, the five-factor solution for the 16 variables of external industry structure is considered to be acceptable. The factors retained for the purposes of further analysis are as follows:

Factor 1, *level of competition*, consists of the following variables: increase in the number of HTVE institutions; decrease in the number of HTVE students; and high intensity of competition between institutions.

Factor 2, *threat of substitutes*, consists of threat from foreign institutions of higher education; threat from China-based institutions of higher education; and threat from private business enterprises.

Factor 3, *power of indirect players*, consists of power of parents and power of employers.

Factor 4, *power of direct players*, comprises power of the Taiwan MOE and power students.

Factor 5, *barriers facing entrants*, refers to minimum capital required for establishing a new institution, and regulations and policies of government on the operation of an educational institution.

The internal consistencies of the identified factors for external industry structure were: 0.69 for 'level of competition', 0.70 for 'threat of substitutes', 0.42 for 'power of indirect players', 0.34 for 'power of direct players', and 0.48 for 'barriers facing entrants'. Given that 0.7 is the cut-off value of Cronbach's alpha in this study, the factors of 'power of indirect players', 'power of direct players', and 'barriers facing entrants' were eliminated. The low Cronbach's alphas imply that these items included in each of the three factors are not very effective in explaining the overall variance of these factors. Another possible explanation for the low Cronbach's alphas is that more than two items would be needed to explain the variance. The size of Cronbach's alpha generally increases as the number of items in the scale increase (Cronbach, 1951; Voss, Stem & Fotopoulos, 2000).

Table 7-2 Results of factor analysis for external industry structure

Items	Factor 1 Level of competition	Factor 2 Threat of substitutes	Factor 3 Power of indirect players	Factor 4 Power of direct players	Factor 5 Barriers facing entrants
Increase in the number of HTVE institutions	.814				
Decrease in the number of HTVE students	.753				
High intensity of competition between institutions	.675				
Threat from foreign institutions of higher education		.808			
Threat from China-based institutions of higher education		.804			
Threat from private business enterprises		.727			
Power of parents			.759		
Power of employers			.661		
Power of students				.719	
Power of the Taiwan MOE				.653	
Minimum capital required for establishing a new institution					.772
Regulations and policies of government on the operation of an educational institution					.720
Eigenvalues	2.995	2.161	1.425	1.161	1.073
% of variance explained	18.716	13.508	8.903	7.255	6.705
Cronbach's alpha	0.69	0.70	0.42	0.34	0.48

7.4.2 Factor analysis for internal resources

The factor analysis results for the internal resources variables are provided in Table 7-3. The un-rotated factor solution generated five factors with Eigenvalues greater than 1. These five factors account for 71.1% of the total variance, with the first factor accounting for a total of 47.4%. The loading pattern, factor structure and factor interpretation are shown in Table 7-3. The factors were defined by variables with significant factor loadings above 0.60. The five factors were defined by two or more variables and were retained for further analysis. These were:

Factor 1, *human resources*, refers to staffing, faculty qualifications, job loyalty, teamwork, leadership, and organizational efficiency.

Factor 2, *marketing capabilities*, consists of variables such as media promotion, scholarships and financial aids offered, participation in off-campus activities and events, strategic alliances with vocational high schools, and partnerships with other higher education institutions.

Factor 3, *curriculum*, refers to distinctiveness in curriculum design and high quality curriculum.

Factor 4, *financial resources*, comprises the issues of sufficient financial capital, financial planning and budgeting, and financial implementation.

Factor 5, *R&D capabilities*, consists of participation in government-funded research projects, collaboration with private business enterprises, and integration of administrative resources.

The internal consistencies of the identified factors for internal resources were: 0.91 for 'human resources', 0.87 for 'marketing', 0.91 for 'curriculum', 0.92 for 'financial resources', and 0.90 for 'R&D capabilities'. These suggested strong internal consistency in factor structure.

Table 7-3 Results of factor analysis for internal resources

Items	Factor 1 Human resources	Factor 2 Marketing capabilities	Factor 3 Curriculum	Factor 4 Financial resources	Factor 5 R&D capabilities
Teamwork	.837				
Job loyalty	.835				
Leadership	.699				
Staffing	.671				
Organizational efficiency	.605				
Faculty qualifications	.604				
Media promotion		.791			
Participation in off-campus activities and events		.723			
Scholarships and financial aids offered		.707			
Strategic alliances with vocational high schools		.694			
Partnerships with other higher education institutions		.623			
High quality curriculum			.749		
Distinctiveness in curriculum design			.724		
Financial implementation				.811	
Financial planning and budgeting				.809	
Participation in government-funded research projects					.813
Collaboration with private business enterprises					.757
Integration of administrative resources					.608
Eigenvalues	11.760	2.247	1.504	1.233	1.030
% of variance explained	47.039	8.988	6.017	4.932	4.121
Cronbach's alpha	0.91	0.87	0.91	0.92	0.90

7.4.3 Factor analysis for institutional performance

The factor analysis results for the institutional performance variables are provided in Table 7-4. The un-rotated factor solution identified four factors, accounting for 68.3% of the total variance, with the first factor accounting for a total of 47.9%. The factors were defined by variables with significant factor loadings above 0.60. Four factors were defined by two or more than two variables and are retained for the purposes of further analysis. These were:

Factor 1, *institution-level performance*, refers to magazine ranking, industry evaluation on the quality of graduates, graduate/alumni evaluations, and institutional reputation.

Factor 2, *staff performance in teaching*, consists of practical experience and skills of teaching staff, and institutional culture.

Factor 3, *staff performance in research*, refers to staff performance in both academic and applied research, and industry-academia collaboration.

Factor 4, *student performance*, includes the employment rate of new graduates, percentage of graduates pursuing further studies, and pass rate on certificate/licensure exams.

Table 7-4 Results of factor analysis of institutional performance

Items	Factor 1 Institution-level performance	Factor 2 Staff performance in teaching	Factor 3 Staff performance in research	Factor 4 Student performance
Magazine ranking	.783			
Industry evaluation on the quality of graduates	.778			
Graduate/alumni evaluations	.707			
Institutional reputation	.672			
Staff performance in teaching		.764		
Practical experience and skills of teaching staff		.749		
Institutional culture		.626		
Staff performance in applied research			.880	
Staff performance in academic research			.827	
Industry-academia collaboration			.765	
Percentage of graduates pursuing further studies				.747
Employment rate of new graduates				.729
Pass rate on certificate/licensure exams				.720
Eigenvalues	9.094	1.582	1.203	1.101
% of variance explained	47.865	8.325	6.333	5.795
Cronbach's alpha	0.87	0.82	0.89	0.80

The internal consistencies of the 'institutional-level performance', 'staff performance in teaching', 'staff performance in research', and 'student performance' factors were 0.87,

0.82, 0.89, and 0.80, respectively. These suggested strong internal consistency in factor structure.

7.5 Classification of strategy types

Preliminary analysis was conducted on the data using cluster analysis followed by discriminant analysis. The cluster analysis was completed to identify which strategy each HTVE institution was using, while the discriminant analysis was used to confirm the strategy type to which each HTVE institution was assigned.

7.5.1 Cluster analysis

Cluster analysis was used to segment the sample based on strategic positioning. The data collected, using nine variables relating to the extent to which respondents were involved in strategic activities and orientations, were used to cluster the sample.

The cluster analysis allowed the researcher to identify different types of strategy undertaken by HTVE institutions in Taiwan. The results of the cluster analysis enabled the researcher to identify four segments that, when compared with each other, resembled Miles and Snow's (1978) typology of strategic orientations, namely Prospectors, Analyzers, Defenders and Reactors.

The results of the cluster analysis are presented in Table 7-5. In summary they are:

- ◆ Institutions in Cluster 4 indicated the highest level for overall strategic practices and fit the characteristics of Prospectors. The institutions in this cluster were able to identify future trends and opportunities (mean=6.08) and aggressively enter new markets (mean=5.72) with new product developments (mean=5.78). They were also willing to focus their efforts on innovation (mean=6.24) and attempt to create value for customers (mean=5.61) with a view to broadening the size of their customer base (mean=6.48). This type of HTVE institution had an aggressive attitude towards growth (mean=5.95) and tended to grow quickly (mean=5.85).

- ◆ Institutions in Cluster 3 scored the second lowest mean scores on the majority of the items and would be most consistent with the characteristics of Defenders. The institutions in this cluster would seldom forecast trends into the future (mean=4.25) and were cautious in entering new markets (mean=4.10) with new product development (mean=4.42). They focused more efforts on lowering operational costs (mean=4.51) and on maintaining the current customer base (mean=4.53) with a view to ensuring the stability of that base (mean=5.20). This type of HTVE institution took a very careful attitude towards growth (mean=4.55) to ensure stability in the market (mean=4.47).

- ◆ Institutions in Cluster 2 fell between Prospectors and Defenders in terms of the mean scores and were considered to be Analyzers.

- ◆ Institutions in Cluster 1 scored lowest on all of the items, compared with the other clusters, and were labeled Reactors.

Table 7-5 Results of cluster analysis

Strategy types	<u>Cluster 1</u> Reactors (n=66)	<u>Cluster 2</u> Analyzers (n=65)	<u>Cluster 3</u> Defenders (n=91)	<u>Cluster 4</u> Prospectors (n=101)
Variables	Mean	Mean	Mean	Mean
QD61. Marketing approach	3.92	4.17	4.53	5.61
QD62. Product mix stability	3.21	5.43	4.42	5.78
QD63. Market definition	4.48	5.42	4.10	5.72
QD64. Competitive edge	3.45	5.58	4.51	6.24
QD65. Environmental monitoring	3.79	5.38	4.25	6.08
QD66. Attitude towards growth	2.53	3.86	4.55	5.95
QD67. Customer base stability	4.36	5.68	5.20	6.48
QD68. Growth pattern	2.38	2.20	4.47	5.85
Total summed mean scores	28.12	37.72	36.03	47.71

7.5.2 Discriminant analysis

Discriminant analysis was used to confirm the classification of strategies provided by the cluster analysis. Table 7-6 illustrates that those classified as Prospectors (n=96) were 93.1% correctly specified. Those classified as Defenders (n=86) were 94.5% correctly specified. For Analyzers, (n=62) the accuracy rate fell to 95.4%. For Reactors (n=62), the accuracy rate fell to 93.9%.

Table 7-6 Results of discriminant analysis

Strategy types	Predicted Group Membership								Total	
	Reactors		Analyzers		Defenders		Prospectors			
	N	%	N	%	N	%	N	%		
Original	Reactor	62	93.9	1	1.5	3	4.5	0	0	N=66
	Analyzer	1	1.5	62	95.4	1	1.5	1	1.5	N=65
	Defender	2	2.2	3	3.3	86	94.5	0	0	N=91
	Prospector	0	0	1	1	6	5.9	94	93.1	N=101
Total	N=65		N=67		N=96		N=95		N=323	

94.1% of original grouped cases correctly classified.
 $(62+62+86+94)/323=94.1176$

7.6 Hypotheses Testing

7.6.1 Hypothesis one

Hypothesis One stated that HTVE institutions that adopt different types of strategy have significantly different perceptions of their external industry structure. ANOVA analysis was conducted to test this hypothesis. The results indicate that there are no significant differences in perceptions of external industry structure among the four strategy types (see Table 7-7). A close examination of the results found that Defenders were more concerned about the relative impact of ‘threat of substitutes’ on strategy formulation and implementation than Prospectors, whereas Prospectors were more concerned about the relative impact of ‘level of competition’ on strategy formulation and implementation than Defenders.

On the basis of the results of this ANOVA testing, Hypothesis One was rejected.

Table 7-7 Differences in perceptions of external industry structure between four strategy types

	Reactors		Analyzers		Defenders		Prospectors		F	Sig.
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
<i>External industry structure</i>										
Level of competition	6.53	0.71	6.45	0.71	6.34	0.86	6.39	0.76	0.82	0.484
Threat of substitutes	3.51	1.17	3.59	1.21	3.96	1.20	3.79	1.30	2.13	0.097

p<0.05

7.6.2 Hypothesis two

Hypothesis Two stated that external industry structure will negatively affect institutional performance. The technique used to test the hypothesis was multiple regression analysis. Table 7-8 illustrates the results of this analysis. The multiple regressions of the two factors of external industry structure with the four factors of

institutional performance did not register highly significant F-ratios. The R square values range from 0.5 to 0.7, indicating how institutional performance was explained and accounted for by external industry structure. The Durbin-Watson values are within the acceptable range of 1.5 to 2.5 (Durbin & Watson, 1950 & 1951), indicating that there is no significant autocorrelation in the residuals.

The analysis demonstrates that ‘level of competition’ was significantly and positively related to ‘staff performance in teaching’, whereas ‘threat of substitutes’ was significantly and positively related to ‘staff performance in research’ and ‘student performance’. Contrary to expectations, a positive relationship was found between external industry structure and institutional performance. Therefore, Hypothesis Two was rejected.

**Table 7-8 Multiple regression results:
external industry structure to institutional performance**

Dependent variable \ Independent variable	Institution-level performance			Staff performance in teaching		
	Beta	t-value	p-value	Beta	t-value	p-value
Level of competition	0.039	0.692	0.489	0.113	2.033	0.043*
Threat of substitutes	0.102	1.824	0.069	0.030	0.545	0.586
R ²			0.011			0.013
Adjusted R ²			0.005			0.007
F-Ratio			1.843			2.163
Durbin-Watson			1.750			1.937

Dependent variable \ Independent variable	Staff performance in research			Student performance		
	Beta	t-value	p-value	Beta	t-value	p-value
Level of competition	0.016	0.288	0.773	0.064	1.164	0.245
Threat of substitutes	0.154	2.788	0.006*	0.172	3.122	0.002*
R ²			0.024			0.033
Adjusted R ²			0.018			0.026
F-Ratio			3.897*			5.378
Durbin-Watson			1.766			1.686

* Note: p<0.05

External industry structure is the independent variable that is measured by level of competition and threat of substitutes.

Institutional performance is the dependent variable that is measured by institution-level performance, staff performance in teaching, staff performance in research, and student performance.

7.6.3 Hypothesis three

Hypothesis Three stated that HTVE institutions adopt different types of strategy based on the combinations of resources that they have. ANOVA analysis was conducted to test this hypothesis. The results indicate that there are significant differences in combinations of internal resources among the four strategy types (see Table 7-9).

Prospectors place the greatest emphasis on all five factors of internal resources, whereas Reactors place the least emphasis. Analyzers and Defenders are somewhere between the Prospectors and Reactors when rating the relative importance of internal resources. A closer examination of the results revealed that Prospectors, Analyzers and Reactors rated ‘human resources’ as the most important internal factor of HTVE institutions, whereas Defenders regarded ‘financial resources’ as the most important internal factor of HTVE institutions.

On the basis of the results of this ANOVA testing, Hypothesis Three was accepted.

Table 7-9 Differences in combinations of internal resources between four strategy types

	Reactors		Analyzers		Defenders		Prospectors		F	Sig.
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
<i>Internal resources</i>										
Human resources	4.66	1.08	5.55	0.82	5.38	0.99	5.91	0.73	25.63	0.000*
Marketing capabilities	3.90	1.18	4.80	1.00	4.67	0.85	5.39	0.80	33.44	0.000*
Curriculum	4.43	1.12	5.07	0.88	5.05	1.10	5.53	0.80	15.44	0.000*
Financial resources	4.48	1.64	5.42	1.25	5.40	1.29	5.77	1.01	13.83	0.000*
R&D capabilities	3.63	1.31	4.74	1.18	4.37	1.13	5.11	1.09	22.80	0.000*

* p<0.05

7.6.4 Hypothesis four

Hypothesis Four proposed that internal resources will positively affect institutional performance. The technique used to test the hypothesis was multiple regression analysis. Table 7-10 illustrates the results of the multiple regression analysis. The multiple regressions of the five factors of internal resources with the four factors of institutional performance registered highly significant F-ratios. The R square values range from 31.8 to 59.2, indicating how institutional performance was explained and accounted for by internal resources. The Durbin-Watson values fell within the acceptable range of 1.5 to 2.5, indicating that there is no significant autocorrelation in the residuals (Durbin & Watson, 1950 & 1951).

The analysis demonstrates that ‘human resources’ were significantly and positively related to ‘institution-level performance’, ‘staff performance in teaching’, and ‘staff

performance in research’. ‘Curriculum’ was significantly and positively related to ‘institution-level performance’, ‘staff performance in teaching’, and ‘student performance’. ‘R&D capabilities’ were significantly and positively related to ‘institution-level performance’, ‘staff performance in research’, and ‘student performance’. ‘Marketing capabilities’ were significantly and positively related to ‘staff performance in research’. As expected, a positive relationship was found between internal resources and institutional performance. Therefore, Hypothesis Four was accepted.

**Table 7-10 Multiple regression results:
internal resources to institutional performance**

Dependent variable Independent variable	Institution-level performance			Staff performance in teaching		
	Beta	t-value	p-value	Beta	t-value	p-value
Human resources	0.310	4.494	0.000*	0.485	8.101	0.000*
Marketing capabilities	-0.030	-0.459	0.646	0.041	0.726	0.469
Curriculum	0.202	3.355	0.001*	0.327	6.240	0.000*
Financial resources	-0.018	-0.315	0.753	-0.126	-2.517	0.012
R&D capabilities	0.267	4.311	0.000*	0.063	1.169	0.243
R ²			0.384			0.535
Adjusted R ²			0.375			0.528
F-Ratio			39.589*			72.944 *
Durbin-Watson			1.686			1.877

Dependent variable Independent variable	Staff performance in research			Student performance		
	Beta	t-value	p-value	Beta	t-value	p-value
Human resources	0.146	2.614	0.009*	0.113	1.572	0.117
Marketing capabilities	.208	3.970	0.000*	-0.009	-0.131	0.896
Curriculum	-0.016	-0.329	0.742	0.278	4.421	0.000*
Financial resources	0.028	0.596	0.551	0.101	1.673	0.095
R&D capabilities	0.518	10.339	0.000*	0.224	3.458	0.001*
R ²			0.599			0.329
Adjusted R ²			0.592			0.318
F-Ratio			94.533*			31.045*
Durbin-Watson			1.968			1.853

* Note: p<0.05

Internal resources is the independent variable that is measured by human resources, marketing capabilities, curriculum, financial resources, and R&D capabilities.

Institutional performance is the dependent variable that is measured by institution-level performance, staff performance in teaching, staff performance in research, and student performance.

7.6.5 Hypothesis five

Hypothesis Five proposed that institutional performance differs based on the types of strategy that HTVE institutions adopt. ANOVA test was used to test this hypothesis. As indicated in Table 7-11, there are significant differences in levels of institutional performance among the four types of strategy. Prospectors are likely to perform the best on all four factors of institutional performance, whereas Reactors have the worst

performance. Analyzers and Defenders are somewhere between the Prospectors and Reactors in terms of institutional performance.

On the basis of the results of this ANOVA testing, Hypothesis Five was accepted.

Table 7-11 Differences in levels of institutional performance between four strategy types

	Reactors		Analyzers		Defenders		Prospectors		F	Sig.
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
<i>Institutional Performance</i>										
Institution-level performance	5.01	1.10	5.71	0.84	5.23	0.89	5.85	0.79	15.42	0.000*
Staff performance in teaching	5.19	0.97	5.74	0.77	5.38	0.89	5.86	0.60	11.97	0.000*
Staff performance in research	3.99	1.32	5.08	1.14	4.94	1.02	5.44	0.94	24.14	0.000*
Student performance	4.76	1.13	5.54	0.75	5.21	0.90	5.53	0.78	12.18	0.000*

* p<0.05

7.7 Summary

This chapter presented the results of the quantitative analysis of data gathered via a survey of HTVE institution senior managers. The majority of respondents were 41-60 year old deans of academics, deans of student affairs, deans of R&D, or deans of general affairs. They were from private institutes of technology with a population of 6,001-15,000 students in either Northern or Southern Taiwan. These respondents had been in the educational administration field for 6-10 years and in their current institution for less than six years.

The major factors of external industry structure, internal resources, and institutional performance were identified using factor analysis, whereas the types of strategy undertaken by HTVE institutions were classified using cluster analysis and discriminant analysis.

A series of hypotheses proposed in the conceptual framework (illustrating the relationships between external industry structure, internal resources, and strategy types with institutional performance) were examined through a series of ANOVA analyses

and multiple regression analyses. Table 7-12 summarizes the results of the hypotheses tests. A discussion of these results is presented in the next chapter.

Table 7-12 The results of the hypotheses tests

No. of hypothesis	Hypothesis statement	Accepted /rejected
Hypothesis One :	HTVE institutions that adopt different types of strategy have significantly different perceptions of their external industry structure.	Rejected
Hypothesis Two :	There is a negative relationship between external industry structure and institutional performance	Rejected
Hypothesis Three:	HTVE institutions adopt different types of strategy based on the combinations of resources that they have.	Accepted
Hypothesis Four :	There is a positive relationship between internal resources and institutional performance	Accepted
Hypothesis Five :	Institutional performance differs based on different types of strategy that HTVE institutions adopt.	Accepted

CHAPTER 8: DISCUSSION

8.1 Introduction

In the previous chapter, the results of this research were discussed with a focus on the research questions. More specifically, the factors of the major aspects that determine the competitive advantage of HTVE institutions; the classification of strategy types undertaken by HTVE institutions; and the relationships between the major aspects of competitive advantage in the context of Taiwan's HTVE sector were discussed. The research questions, as presented at the beginning of this thesis, are:

- i. What are the elements and indicators of competitive advantage as they apply specifically to HTVE institutions?
- ii. What types of strategy undertaken by HTVE institutions best fit with their internal and external environments?
- iii. What are the major factors of external industry structure, internal resources, and institutional performance? and
- iv. What are the relationships between external industry structure, internal resources, and strategy types with institutional performance in the context of Taiwan's HTVE?

8.2 Factors in the major aspects of competitive advantage

This section addresses the research question regarding the major factors of external industry structure, internal resources, and institutional performance in the context of Taiwan's HTVE sector.

8.2.1 Factors of external industry structure

The results of the quantitative research suggest that the HTVE sector is complex and the external industry structure should be examined in two parts: 'level of competition' and 'threat of substitutes'. Consistent with previous studies (McElwee & Pennington, 1993; Dobni & Dobni, 1996; Collis, 1999, Martinez & Wolverton, 2009), the application of Porter's (1980) five-force model of competition to analyze the competitive environment in which Taiwan's institutions of higher education operate was useful, even though this

framework was originally designed to consider for-profit organizations. The results also confirm the relevance and potential usefulness of Porter's (1980) five-force model of competition in the non-profit arena. This is contrary to the view of Goold (1997), who argued that Porter's model was not applicable.

From the perspective of senior managers, 'level of competition' was rated the most important external factor affecting the competitive advantage of HTVE institutions, whereas 'threat of substitutes' was rated the lowest. These results are consistent with Porter's (1985) assertion that the intensity of competitive rivalry is the major determinant of the sustainability of the industry. It helps determine to what degree the value will be affected by head-to-head competition.

According to the results of the quantitative research, domestic competitors (e.g. level of competition) have more direct influence on the structure of Taiwan's HTVE sector than overseas competitors (e.g. threat of substitutes). These results support Chang et al.'s (2005) argument that the oversupply of educational opportunities has made it more difficult for HTVE institutions to recruit freshmen. However, it is worth noting that the results suggest that there is relatively little threat of substitute suppliers entering Taiwan's HTVE sector. This may be because the Taiwan MOE does not recognize foreign academic degrees acquired domestically through correspondence, complete distance education, or through delegated organizations that recruit and teach classes in Taiwan (Taiwan MOE, 2009d). That is to say, students will have to go abroad if they wish to acquire foreign academic degrees. Thus, foreign institutions of higher education are not yet seen as a major threat to Taiwan's HTVE sector.

8.2.2 Factors of internal resources

The results of the quantitative research suggest that the internal resources HTVE institutions are endowed with should be classified into five broad categories: 'human resources', 'marketing capabilities', 'curriculum', 'financial resources', and 'R&D capabilities'. This five-factor classification of internal resources contained similar elements to those used in previous research (Hofer & Schendel, 1978; Snow & Hrebiniak, 1980; Barney, 1991; Verona, 1999). This means that certain types of resources and capabilities are more important in achieving competitive advantage regardless of industry/sector type. Although researchers have used different categories,

they refer to the same basic types of resources and capabilities (Hofer & Schendel, 1978; Snow & Hrebiniak, 1980; Wernerfelt, 1984; Barney, 1991; Grant, 1991).

From the perspective of senior managers, 'human resources' are considered the essential element of HTVE institutional operations and they should be managed effectively and efficiently. This result supports the study of Shattock (2003), who concluded that the core functions of higher education institutions are learning, teaching, research, and service to their community. These core functions could only be performed effectively and efficiently when high quality academic and non-academic administrative staff are hired and retained (Shattock, 2003). Therefore, human resources should be managed in an integrated way in order to achieve competitive advantage. This view is also confirmed by Welsh and Metcalf (2003) who claimed that excellent institutional performance is dependent on faculty and staff involvement, and support for institutional effectiveness activities.

'R&D capabilities', which refers to the ability of a HTVE institution to participate in government-funded research projects, to collaborate with private business enterprises, and to integrate academic and research resources, was found to be the least important in achieving competitive advantage. This result supports Marsh and Hattie (2002), who argued that one of the major differences between universities and non-university tertiary institutions (e.g. HTVE institutions) is that academics in higher education are expected to pursue research. This may be because non-university tertiary institutions concentrate on enriching professional knowledge and occupational ethics, strengthening advanced study potential, promoting career development and cultivating basic technical personnel. This result further confirms the view that Taiwan's HTVE sector focuses on practical and applied implications but not on academic implications (Mathews & Hu, 2007; Department of Technological and Vocational Education, 2008).

8.2.3 Factors of institutional performance

The results of the quantitative research suggest that institutional performance should be measured along the following four factors: 'institution-level performance', 'staff performance in teaching', 'staff performance in research', and 'student performance'. This result supports Cameron's (1978) nine factors of institutional performance indicators across the assessment of student performance, of staff performance and of

institution-level performance. While Cameron's (1978) nine factors of institutional effectiveness encompass a wide range of important variables, the study extends earlier research and includes other institutional performance factors that are specific to HTVE institutions, namely 'staff performance in teaching' and 'staff performance in research'.

Previous researchers have suggested that two aspects of staff performance should be assessed: teaching and research. Marsh and Hattie (2002) argued that faculty members have to undertake research, teaching, and service roles and responsibilities to carry out the academic work of their institutions. Their roles and responsibilities are closely tied to the central functions of the institution.

Senior managers rated 'staff performance in teaching' as the most important performance indicator, whereas 'staff performance in research' was rated the lowest. This supports the view of Madu and Kuei (1993), who noted the importance of staff performance in teaching within the context of higher education. The authors noted that obtaining a higher education qualification is now a prerequisite for being employed after graduation. To remain competitive in the future, institutions, as the centres for providing the advanced training and education needed for the workforce, should enhance and maintain the quality of education through staff commitment to quality teaching.

As such, to improve the quality of teaching in the context of Taiwan's HTVE sector, the technical talents of teaching staff should be continuously cultivated, in addition to their academic qualifications. This could be done through industry-academia collaboration (Department of Technological and Vocational Education, 2008). Such collaboration helps industry to find suitable professionals and students to prepare for their future careers. Teachers are encouraged to work with industry in order to offer a more practical curriculum. The mutual benefits for teachers, students, schools and enterprises are obvious (Department of Technological and Vocational Education, 2008). This view is also supported by Dalyan (2004), who claimed that industry-academia collaboration can foster employability skills and attributes in HTVE students. Such collaboration also benefits curriculum programs by ensuring that curriculum content effectively prepares students for their future employment. Industry-academia collaboration assists in developing tailor-made curriculum and improving the practical experience of teaching staff. It can help bridge the demand-supply gap and prepare graduates for employment.

8.3 Classification of strategy types

This section addresses the research question regarding the types of strategy undertaken by HTVE institutions to best fit with their internal and external environments.

Miles and Snow's (1978) typology of strategy was adopted in this study to classify the strategy types HTVE institutions adopt. Using this typology, it was found that all four strategy types co-exist in the HTVE sector. This is consistent with the argument of Garrigos-Simon, Marques and Narangajavana (2005) that Prospectors, Analyzers, Defenders and Reactors can all be viable in a given situation.

The results also indicate that Prospectors account for the largest proportion of HTVE institutions, followed by Defenders, Reactors and Analyzers. These results suggest that the HTVE sector is a dynamic sector. The Prospector strategy is the preferred approach to meeting the demands of a changing and uncertain environment (Miles & Snows, 1978). Those institutions endeavoring to upgrade themselves from college to institute or from institute to university may also use a Prospector strategy. Prospectors have an externally-oriented focus and have little problem accepting change or strategic reorientation. They continually scan the environment for opportunities and adjust their 'fit' with the environment to maximize trends and potential chances. This type of institution also tends to create extensive changes in their products and markets.

However, it is worth noting that a proportion of HTVE institutions view their operating environment as certain and stable, and indicated their preference to adopt a Defender strategy. Defenders may be those that have previously developed the reputation as niche suppliers of specific academic products, such as those related to nursing, linguistics, arts and music. They are internally-oriented institutions with narrow product market domains, but preferring to concentrate on existing markets and improving their operational efficiency. This type of institution has selected niche markets and is prepared to use significant resources to defend against competitors.

Based on the preceding discussion, it is clear that Taiwan's HTVE sector is comprised of a generally aggressive group of institutions. They acknowledge the rapid changes around them and are flexible in adapting their practices to deal with those changes. However, significant differences exist in the level of aggression with regard to market and product growth activities among the four types of strategy.

8.4 Relationship between the major aspects of competitive advantage

This section addresses the research question regarding the relationships between external industry structure, internal resources, and strategy types with institutional performance in the context of the HTVE sector. The relationships between these four aspects are now discussed.

8.4.1 Relationship between external industry structure and strategy types

The results of the quantitative research suggest that there are no significant differences among the four strategy types in the perceptions of the external industry structure. This implies that although HTVE institutions perceive the external environment in which they operate in a similar way, they still adopt different strategies to achieve competitive advantage. An examination of the perspectives of senior managers within HTVE institutions found that Defenders were more concerned about the relative impact of 'threat of substitutes' on strategy formulation and implementation than Prospectors. Prospectors were more concerned about the relative impact of 'level of competition' on strategy formulation and implementation than Defenders. These results may be attributed to the understanding that Defenders are conservative and seek to secure a niche market in a relatively stable environment (Miles & Snows, 1978). If the threat of substitutes is weak, it is less likely that foreign and existing competitors enter or exit the market, thus the market is relatively stable and a defensive strategy is thought to be most effective. In contrast, Prospectors will likely perceive the current status of HTVE as dynamic. As such, they are flexible and frequently offer new products and realize new market opportunities (Miles & Snows, 1978). Thus, Prospectors are optimistic about their situation and consider existing competitors as stimulus to innovate product offerings that will expand their market base.

Formulating and implementing strategy congruent to the external environment has been an important challenge for HTVE institutions. Although the results do not support the

argument of Miles and Snow (1978) that the perception of industry environment is likely to vary considerably from one strategy over another, they do confirm the view that certain strategy types are more concerned about certain types of competitive forces.

8.4.2 Relationship between external industry structure and institutional performance

The results of the quantitative research indicate that institutional performance is influenced by two factors of external industry structure: 'threat of substitutes' and 'level of competition'. The stronger the 'threat of substitutes' and the 'level of competition' are, the better student and staff performance at HTVE institutions will be. This result does not align with Porter's (1980) view that the stronger the collective impact of the five competitive forces, the lower the combined profitability of the firms in an industry. This might be because senior managers hold strong beliefs that HTVE institutions could remain profitable in tough external environments, if they are well positioned to address the challenges of domestic and international competition. That is to say, the harder HTVE institutions work; the more progress they make. Hitt et al. (2001) found that even when industry is highly competitive (forces are strong), it can be profitable for those who are well-positioned.

The results also illustrate that there are significant and positive relationships between 'level of competition' and 'staff performance in teaching', as well as between 'threat of substitutes' and 'staff performance in research' and 'student performance'. The existence of substitutes for HTVE institutions might place them under pressure of competition, which in turn might impose greater demands on teaching staff. Teaching staff would likely take proactive steps to improve their individual performance through participation in both academic and applied research. Teaching staff are likely to be on the cutting edge of their disciplines and aware of international perspectives in their fields, if they are active researchers (Marsh & Hattie, 2002). Moreover, the threat of substitutes might also erode the power of monopolies that traditional institutions have enjoyed in the HTVE market. Students then have more options to choose from when selecting which HTVE institutions and what majors to enrol in than they did in the past.

8.4.3 Relationship between internal resources and strategy types

The results illustrate that Prospectors place greater emphasis on all five types of internal resources than Analyzers, Defenders and Reactors. Regardless of the kind of strategy adopted, the importance of internal resources on strategy formulation and implementation cannot be underestimated (Miles & Snows, 1978).

An examination of the perceptions of senior managers found that the role of internal resources varies considerably across the different types of strategy that can be adopted. Prospectors are more concerned about the availability of ‘human resources’ as a foundation for strategy formulation and implementation, whereas Defenders view ‘financial resources’ as the most important determinant of strategy formulation and implementation. These results are consistent with Snow & Hrebiniak (1980) and Benedetto & Song (2003), who claimed that internal resources provide the basic direction for strategy formulation and implementation. Certain resources and capabilities will be relatively more important to the respective types of strategy. Therefore, for HTVE institutions to achieve competitive advantage, the formulation and implementation of strategy should be linked to the availability of resources and capabilities. The influence of different combinations of internal resources on strategy formulation and implementation varies. Prospectors are likely to be competent at human resources and look for highly qualified academic and administrative staff who are willing to make the effort to enhance institutional performance. In contrast, Defenders tend to base their strategy on financial resources and value financial resources that enable them to sustain their market position.

8.4.4 Relationship between internal resources and institutional performance

The results of the quantitative research illustrate that internal resources have significant and positive impact on institutional performance. These results support the argument of Barney (1991) that an organization with valuable, rare, non-substitutable and inimitable resources and capabilities has greater potential to achieve competitive advantage and enjoy superior performance.

Firstly, ‘human resources’ are significantly and positively related to ‘institution-level performance’, ‘staff performance in teaching’ and ‘staff performance in research’. This result is consistent with Brown’s (2005) argument that teaching and research are interrelated, forming a continuum of academic activity. Teaching can be enhanced by

research. The active involvement of teaching staff in research should strengthen the quality of teaching (Marsh & Hattie, 2002). It has been recognized that the purpose of HTVE is to help all students gain practical skills, understanding and credentials to participate effectively in the workplace and society (Silins & Murray-Harvey, 1999). To achieve this goal, teaching staff who continue to update their practical/technical skills are considered highly qualified.

Secondly, 'curriculum' is significantly and positively associated with 'staff performance in teaching' and 'student performance'. This result is consistent with Nedwek and Neal (1994), who indicated a relationship between curriculum and student outcomes. Student performance is influenced by the educational experience and is closely tied to the quality, content and delivery method of education. Given that the purpose of HTVE is to ensure graduates are ready for employment, the most comprehensive and advanced courses, together with the most comprehensive training programs, should be incorporated into curriculum design (Department of Technological and Vocational Education, 2008).

Finally, 'R&D capabilities' have proven to significantly and positively influence 'institution-level performance', 'staff performance in research' and 'student performance'. Teachers play a key role in delivering instruction to students. The quality of education and training delivery varies depending on the theoretical knowledge and practical experience of teachers. Thus, teachers are learners as well. They have to improve their theoretical knowledge and practical skills to function in new and better ways (Madu & Kuei, 1993). Accordingly, students will gain more professional knowledge and skills within their majors. This is consistent with the view of Hamzah and Abdullah (2009) that the quality of teaching is the most important higher institution-related factor influencing student achievement.

From the preceding discussion, it is clear that HTVE institutions are likely to achieve competitive advantage and superior performance if they are equipped with a pool of highly qualified teaching staff with excellent performance in teaching and research, together with the most comprehensive range of high quality degree programs and courses. Strengthening the R&D capabilities is viewed as a value-added component for HTVE institutions. This is because, although R&D capabilities have proven to

positively influence institutional performance, this internal factor is rated the least important in determining the competitive advantage and superior performance of HTVE institutions.

8.4.5 Relationship between strategy types and institutional performance

According to the results of the quantitative research, there are significant differences in levels of performance among HTVE institutions using different types of strategy. These results are consistent with previous research that institutional performance is determined, at least in part, by what type of strategy is formulated and how effectively and efficiently it is implemented (Miles and Snow, 1978; Davig, 1986; Smith et al., 1989; Conant et al., 1990; Saaty & Vargas, 1994; Andrews, Boyne, and Walker, 2006). That is to say, the choice or adoption of strategies by HTVE institutions is likely to lead to differences in performance outcomes.

The results of the quantitative research indicate that Prospectors rated all factors of institutional performance the highest, compared with Analyzers and Defenders; Reactors rated all factors of institutional performance the lowest. These results are consistent with the findings of both Miles and Snow (1978) and Snow and Hrebiniak (1980) who indicated that Prospectors, Analyzers and Defenders performed equally well and were superior to Reactors. HTVE institutions pursuing a Prospector, Analyser, or Defender strategy are likely to achieve superior performance, whereas a Reactor strategy as associated more with poor performance.

As such, superior institutional performance is dependent on the formulation and implementation of a competitive strategy that best fits the external and internal conditions. This is consistent with the argument of Kettunen (2008) that the strategic objectives of an educational institution should be balanced between the external objectives of the environment and the objectives of internal processes describing the value chain of activities. The essence of the strategy is in the activities of an organization, but all these perspectives are important to ensure the performance of an institution.

8.5 Summary

This chapter discussed the results of the study in relation to theoretical perspectives on strategic management and competitive advantage. The discussion of these results builds on and extends previous research by identifying key factors that determine the competitive advantage of HTVE institutions. The types of strategies adopted by HTVE institutions have been classified and the relationships between external industry structure, internal resources, and strategy types with institutional performance have been examined.

It was considered appropriate to use Porter's (1980) five-force model of competition to analyze the competitive environment in which non-profit organizations (e.g. HTVE institutions) operate, even though this framework was originally designed to consider for-profit organizations. This view is consistent with previous studies (McElwee & Pennington, 1993; Collis, 1999). The internal resources HTVE institutions are endowed with were classified into five broad categories. Although this five-factor classification framework differs from previous studies, the factors used referred to similar types of internal resources (Hofer & Schendel, 1978; Snow & Hrebiniak, 1980; Wernerfelt, 1984; Barney, 1991; Grant, 1991). Institutional performance was assessed according to the three levels of achievement: student, staff and institution; staff performance was assessed at two levels: teaching and research. These results concur with Cameron's (1978) nine factors of institutional performance indicators across the assessment of student performance, of staff performance and of institution-level performance. The Miles and Snow (1978) typology of strategy was used as an effective framework for investigating the strategies followed by HTVE institutions in Taiwan.

The results illustrate that significant positive relationships exist between external industry structure and institutional performance, as well as between internal resources and institutional performance. The former is contrary to Porter's (1980) five forces analysis, which advocates a negative relationship between external environment and firm performance. In support of previous studies in different contexts (e.g. Miles & Snow, 1978; Snow & Hrebiniak, 1980; Smith et al., 1989; Conant et al., 1990; Parnell & Wright, 1993; Benedetto & Song, 2003), this study found that significant differences in combinations of internal resources and levels of institutional performance are evident across HTVE institutions using different types of strategy.

Key theoretical and managerial implications, and limitations and suggestions for future research directions are presented in the final chapter of this thesis.

CHAPTER 9: CONCLUSIONS AND IMPLICATIONS

9.1 Introduction

This chapter presents conclusions relating to the research questions. The significance of the research and its contribution to knowledge in the field of study are also discussed, followed by a summary of the relevant managerial implications. This chapter also outlines recommendations for future research, while acknowledging the limitations of this current research.

9.2 Overview of research

HTVE institutions in Taiwan are now faced with the pressure of declining student numbers, as well as competition from many domestic and international institutions. This study aimed to develop a model of competitive advantage to assist and guide HTVE institutions in Taiwan to devise strategies to achieve and maintain superior performance now and in the future.

To achieve this aim, the following four research questions were posed within the context of Taiwan's HTVE sector:

- i. What are the elements and indicators of competitive advantage as they apply specifically to HTVE institutions?
- ii. What types of strategy adopted by HTVE institutions best fit with their internal and external environments?
- iii. What are the major factors of external industry structure, internal resources, and institutional performance? and
- iv. What are the relationships between external industry structure, internal resources, and strategy types with institutional performance in the context of Taiwan's HTVE sector?

This study reviewed the theories of strategic management and applied these concepts within the context of HTVE institutions in Taiwan. The theoretical framework

developed in this study is an integration of IO and RBV theories of competitive advantage. These two theoretical perspectives were combined to provide the theoretical foundation to study strategy and competitive advantage. They are complementary in explaining the effects of external industry structure and internal resources on strategy types, which in turn determine institutional performance.

Concepts and models for strategic planning for higher education have been introduced and developed in a number of prior studies (see Kotler & Murphy, 1981; Grunder, 1991; Bell, 2002; Richards et al., 2004; Mashhadi et al., 2008). However, little research has been undertaken to apply theories of competitive advantage to the HTVE sector in particular. The study was undertaken to extend the literature on strategic management of higher education institutions with a view to providing insights into the strengths and opportunities that can contribute to superior institutional performance, as well as the weaknesses and threats that need to be countered and avoided.

Having developed a theoretical framework, the methodologies best suited to address the relationships between the concepts of interest were considered. Given the lack of relevant literature dealing with Taiwan's HTVE sector, a two-stage research process was employed to develop understanding of issues pertinent to research questions and their investigation. The first stage was qualitative and involved exploring the elements thought to contribute to the competitive advantage of HTVE institutions. These were identified from a series of in-depth interviews with a sample of 32 HTVE senior managers and educational experts in Taiwan's HTVE sector. The second stage of the research was quantitative. A questionnaire was used to survey a large sample of senior managers regarding the relative importance of elements identified in stage one. This would help determine the types of strategy employed by HTVE institutions, and how this might contribute to their competitive advantage. A total of 323 senior managers from different HTVE institutions in Taiwan participated in this study.

9.3 Conclusions regarding the research questions

9.3.1 Elements and indicators of competitive advantage

The first research question guiding this study sought to identify the elements and indicators of competitive advantage as they apply specifically to HTVE institutions. The examination of the external environment (i.e. outside the organizational boundaries of HTVE institutions) generated a list of sixteen elements under the five major headings of ‘threat of entrants’, ‘bargaining power of buyers’, ‘bargaining power of suppliers’, ‘threat of substitutes’, and ‘competitive rivalry’. The examination of the resources that differentiate HTVE institutions from their competitors produced a list of twenty-five elements under the six major headings of ‘organizational resources’, ‘human resources’, ‘financial resources’, ‘physical resources’, ‘marketing capabilities’, and ‘R&D capabilities’. The examination of the indicators for measuring the competitive advantage of HTVE institutions suggested a list of nineteen institutional performance indicators under the three main headings of ‘student performance’, ‘staff performance’, and ‘institution-level performance’.

9.3.2 Classification of strategy types

The second research question aimed to classify the types of strategy adopted by HTVE institutions that would best fit with their internal and external environments. Miles and Snow’s (1978) typology of strategy was used, incorporating Prospectors, Analyzers, Defenders and Reactors. In general, all four types of strategy can be identified in Taiwan’s HTVE sector. However, the majority of HTVE institutions can be classified as Prospectors, indicating that Taiwan’s HTVE sector is made up of a generally strategically aggressive group of institutions.

Moreover, the findings of this study illustrated that all four types of HTVE institutions exhibited markedly aggressive tendencies with regard to market and product growth activities. Prospectors and Analyzers had aggressive tendencies toward new market and product development, as expected of these strategy types. Defenders and Reactors, on the other hand, exhibited conservative tendencies toward current market segments and current products, as expected of these strategy types.

9.3.3 Major factors in influencing and determining the competitive advantage of HTVE institutions

The third research question aimed to ascertain the major factors of external industry structure, internal resources, and institutional performance operating in this sector in Taiwan. The study highlighted that there are two competitive forces influencing the strategy and performance of HTVE institutions. These are ‘level of competition’ and ‘threat of substitutes’. ‘Level of competition’ was deemed to be the most important external factor affecting the competitive advantage of HTVE institutions in Taiwan, whereas ‘threat of substitutes’ was deemed to be the least important factor. For HTVE institutions attempting to maintain their market leadership position, they should be aware that domestic competitors have more direct influence on the structure of Taiwan’s HTVE sector than overseas competitors. HTVE institutions should take into account the actions and reactions of direct rivals (e.g. domestic HTVE providers), while formulating and implementing their competitive strategies. In addition, strategies must be revised regularly to stay compatible with, and relevant to, market needs and a dynamic environment.

Five types of internal resources were found to drive the strategy and the competitive advantage of HTVE institutions in Taiwan. These were ‘human resources’, ‘marketing capabilities’, ‘curriculum’, ‘financial resources’ and ‘R&D capabilities’. ‘Human resources’ was deemed to be the most important internal factor, whereas ‘R&D capabilities’ was deemed to be the least important in achieving competitive advantage. HTVE institutions should place even more emphasis on the competence, qualification and experience of teaching staff in order to achieve superior institutional performance and competitive advantage.

Four dimensions of institutional performance were found to measure the competitive advantage of HTVE institutions in Taiwan. These are: ‘institution-level performance’; ‘staff performance in teaching’; ‘staff performance in research’; and ‘student performance’. Among them, ‘Staff performance in teaching’ was deemed to be the most important dimension of institutional performance, whereas ‘staff performance in research’ was deemed to be the least important. These results reflect the fact that Taiwan’s HTVE sector focuses on practical experience not on academic performance. An HTVE qualification is a prerequisite for being employed after graduation, and

HTVE institutions provide the advanced training and education required for the workforce (Madu & Kuei, 1993). In order to be competitive in the future, HTVE institutions in Taiwan should, however, take into account the quality of education and training as this relies heavily on the institution's commitment to quality teaching.

9.3.4 Relationships between external industry structure, internal resources, and strategy types with institutional performance

The fourth research question aimed to examine the relationships between external industry structure, internal resources, and strategy types with institutional performance. This study indicates that institutional performance may vary considerably from one institution to another, because the types of strategy formulated and implemented by HTVE institutions vary. The differences between strategy types are due to the combination of internal resources that HTVE institutions are equipped with and the perceptions of the external industry structure they operate within.

Two forces within the HTVE sector, namely 'level of competition' and 'threat of substitutes', appear to drive superior institutional performance. This is particularly the case when HTVE institutions are well equipped with a pool of highly qualified teaching staff with excellent performance in teaching and research; the most comprehensive range of high quality programs and courses; and the continuous development of R&D capabilities. These elements serve as inputs to the education delivery system and determine the quality of the output (i.e. institutional performance). As such, it is concluded that HTVE institutions are likely to remain profitable in tough environments if they are well prepared and positioned to address the challenges of both domestic and international competition.

The study confirms the argument that organizations develop consistent patterns of strategic behaviour that align the organisational resources and capabilities with environmental opportunities and threats (Bourgeois, 1980; Miles & Snows, 1978; Schendel & Hofer, 1979). It can be concluded that the competitive advantage of an HTVE institution is dependent on its ability to achieve fit or coherence among a set of competitive factors, both internal and external to the institution. This in turn facilitates high performance. HTVE institutions with high internal and external fit are likely to outperform HTVE institutions with less fit.

Figure 9-1 presents an integrated model of competitive advantage for HTVE institutions in Taiwan which has been developed as a result of this research. This integrated model identifies a range of sector-specific factors that shape the relationship between major aspects of the model and institutional performance within the context of Taiwan's HTVE sector. These aspects are: external industry structure; internal resources; and strategy types. A suggested causality between major aspects of the model is depicted through the use of arrows.

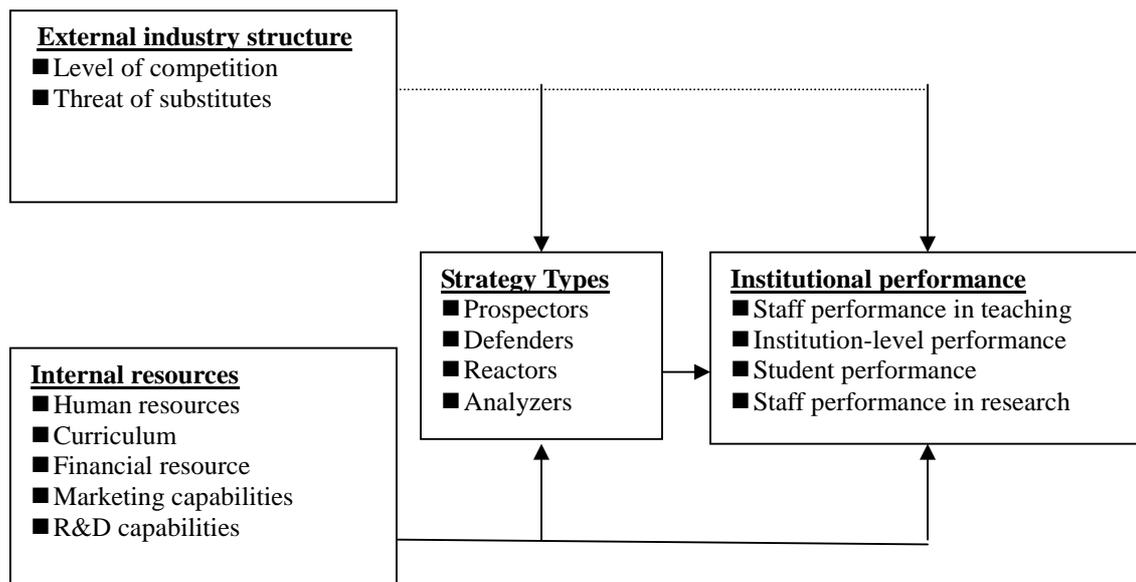


Figure 9-1 Model of competitive advantage for HTVE institutions in Taiwan

The model, presented in Figure 9-1, highlights that there are positive relationships between external industry structure, internal resources, and strategy types with institutional performance. Deploying internal resources through strategies that respond to the changing external environment can enhance institutional performance and achieve competitive advantage.

This study extends earlier research on the relative influence of external industry structure, internal resources, and strategy types on institutional performance. The findings of this study suggest that a range of sector-specific factors of competitive advantage may not have been investigated in previous research relating to higher education strategic planning and management. The integrated model of competitive advantage appears to be a powerful mechanism in efforts to enhance the performance of

Taiwan's HTVE institutions, particularly when faced with intense competition from both domestic and international institutions.

9.4 Significance of the research and its contribution to knowledge

The significance of this research lies in three major contributions to knowledge in the following areas: the theories of strategy and competitive advantage; the strategic management of higher education institutions; and the HTVE in the context of Taiwan.

9.4.1 Theories of strategy and competitive advantage

Few researchers have integrated both IO and RBV theories of strategy and competitive advantage to explain strategic management in the context of higher education. The integration of these two paradigms offers greater opportunities to more thoroughly understand how organizations may gain a competitive advantage and develop long-term sustainability. This study makes a theoretical contribution, developing a framework that integrates these two theories and applying this framework to an educational context. As indicated in theoretical discussions, these two major streams of strategic management literature focus respectively on the influences of external and internal environments on a firm's choice of strategy, which in turn generates superior performance.

9.4.2 Strategic management of higher education institutions

Various strategic planning and management models for educational institutions have been proposed in the literature and provide detailed guidance for the sustainable development of educational institutions (Kotler & Murphy, 1981; Grunder, 1991; Bell, 2002; Richards et al., 2004; Mashhadi et al., 2008). However, relatively little attention has focused on the issue of competitive advantage for a particular component of the educational sector, such as HTVE. This study has advanced the existing body of knowledge by developing a multi-factoral model of competitive advantage to assist and guide institutions of higher education generally, and HTVE institutions in particular, to devise their strategies for superior performance. Developing this model has highlighted that some factors of competitive advantage deserve priority attention for the HTVE sector in Taiwan (e.g. level of competition and human resources), while others (e.g. threats of substitutes and R&D capabilities) are less important contributors to superior institutional performance.

The resulting model serves four purposes. Firstly, it provides government policy-makers and senior managers of HTVE institutions with a means of prioritizing tasks by taking into account the relative importance attached to the various factors of competitive advantage. Secondly, it is an assessment tool for monitoring changes in Taiwan's HTVE sector over time. Government policy-makers and senior managers of HTVE institutions could benefit by using this framework as a means of providing feedback about areas of performance. Thirdly, the model may be applied to examine the performance of educational institutions in Taiwan's HTVE sector. Such research is particularly pressing in light of the increased competition in Taiwan's HTVE market. The model of competitive advantage could assist government policy-makers and senior managers of HTVE institutions to identify the strengths and weaknesses of HTVE institutions, to highlight opportunities and to combat potential threats to further development and long-term sustainability. Finally, the model can be used to examine institutional performance at both department and school levels. As most HTVE institutions are comprised of a number of departments and schools in different professional areas, the overall performance of an educational institution is closely linked with their individual and collective performance in a particular professional area.

9.4.3 Framework for analysis of Taiwan's HTVE sector

Under educational reform policy, many junior colleges have successfully upgraded to university status, making Taiwan's HTVE sector more competitive. HTVE institutions seeking to survive require a sound understanding of the nature of their market. Yet the dynamics of Taiwan's HTVE sector has received little research attention. This study has investigated the historical development and current status of the HTVE sector in the context of Taiwan. As a country-specific study, this research has contributed significantly to the body of knowledge concerning Taiwan's HTVE. However, it may also serve as a reference for neighbouring countries, such as China, Hong Kong and Singapore, operating in similar contexts or wishing to enter Taiwan's higher education market.

9.5 Managerial implications

This research provides valuable insights into the application of a strategic planning and management approach in Taiwan's HTVE institutions. The study explores the factors determining the competitive advantage of HTVE institutions, identifies the level of

importance of these factors, and prioritizes them with a view to developing a strategic framework and management guidelines for the further development of Taiwan's HTVE sector. As this study was conducted from a supply-side perspective, these results have implications for government policy-makers and for senior managers of HTVE institutions in this sector.

9.5.1 Establish market-exit mechanisms

It is always necessary for educational authorities to adopt measures to guide the development their sector. Competition is fierce in Taiwan's HTVE market. It should be considered therefore, that institutions that are not committed to further improvement and/or are unable to compete be forced to quit the market. It has been repeatedly emphasized by the education reform advocates that the market-exit mechanism should be tied to the evaluation mechanism (Chen, 2006). The Taiwan MOE should set up a market-quit mechanism that is integrated into the evaluation mechanism. Institutions found to be below standard may be forced to close and, in some circumstances, merge with leading local or national institutions of HTVE.

9.5.2 Advocate strategic alliances and partnerships between institutions

In an environment of intense competition, HTVE institutions at all levels should cooperate with each other either to gain access to scarce resources or to obtain access to new markets. In Taiwan, the urge to form strategic alliances and partnerships between HTVE institutions has been considered an ideal financial resources solution and a cost effective way of safeguarding the position from competition. It has frequently been noted that resources and funds allocated to private institutions lag far behind those of public institutions (Chang et al., 2005). The sector has matured and faces strong competition from international providers. However, the lack of adequate financial resources to maintain operations is a common problem facing many HTVE institutions, especially private institutions. To compete with those prestigious public educational institutions and increase the barriers to entry, one solution is to form strategic alliances in order to share and exchange scarce resources (Change et al., 2005). For example, if institution A is good at teaching mechanical manufacturing and institution B is good at teaching home economics, then institutions A and B could exchange their education resources and dominate in both areas.

9.5.3 Co-operate with foreign institutions of higher education

With Taiwan's entry into the WTO in 2002, its educational market was widened. While threat of substitutes is considered to be the least important external force for HTVE institutions, it has a strong influence on institutional performance. Taiwan's HTVE institutions could collaborate with foreign institutions of higher education in specified fields for the purpose of internationalizing members of the institution, including students, faculty and administrative staff. Participating institutions need support for their student and faculty exchange programs, joint degree programs, and internationalizing their courses and campuses. Potential partners of Taiwan's HTVE institutions could either be institutions in other Asian countries such as China, or institutions in Western countries such as the USA, Australia, and England. These countries are ranked the most popular overseas study destinations for Taiwanese students (Chen & Zimitat, 2006). On one hand, these co-operations could serve as experiences for the reformation of HTVE in Taiwan. On the other hand, HTVE institutions could exchange their students with other countries or export their graduates to foreign labour markets.

9.5.4 Advocate industry-academia collaborations

The mission of the HTVE sector is to nurture high-quality human resources for industry. Therefore, teaching staff in HTVE institutions should co-operate with business enterprises either through applied research projects or through internship programs to meet the demands and requirements of all kinds of industries (Department of Technological and Vocational Education, 2008).

R&D capabilities are the key for HTVE institutions in distinguishing themselves from competitors in the context of HTVE. R&D capabilities should be 'practice-oriented' and applied research projects should be undertaken for a number of reasons. Firstly, an entrepreneurship centre could be established to foster industry-academia collaboration. Such a centre could have potential to enable HTVE institutions to gain additional revenue from turning their marketable ideas into commercial products and services (Trim, 2003). Secondly, if the HTVE sector and industry jointly design internship courses and programs, students could enter the labour market earlier and receive suitable job offers directly upon graduation (Huang, 2003). The service sector has become the mainstay of Taiwan's industrial development. As such, practical courses are

likely to respond to the market needs of service-oriented industries (Yung & Hsu, 2006). Furthermore, if recent graduates can obtain positions that are highly paid and/or of high social status, public perspectives and attitudes towards the institution would improve, attracting more students into technical and vocational education.

9.5.5 Ensure curriculum design is in compliance with industry requirements

Curriculum has been found to positively influence institutional performance. In this context, HTVE institutions should regularly modify their courses and programs, review their curriculum to include the needs of employers, and bridge the skills gap between what students learn in school and what industry needs (Department of Technological and Vocational Education, 2008). HTVE institutions should use more career-oriented strategies to position themselves in the market, some of which should be event-related (e.g. virtual investment competition); facility-related (e.g. training restaurants and cafeterias); and some type of short-term approach to learning (off-campus internship) (Bhattacharjee, 2008).

Given the importance of institutional autonomy and responsibility in curriculum planning, HTVE institutions should be encouraged to develop a new curriculum that matches rapid economic change and allows the students to be employed immediately. In addition, as part of continuing education, when graduates transfer their profession to a different domain and a new type of work, HTVE institutions could provide them with the technical knowledge and skills necessary to switch careers. This kind of education has been provided, in the most part, by private training centres. HTVE institutions could take the opportunity to broaden their sources of students and increase tuition revenues. In this manner they would be more likely to improve their competitive stance in the market.

9.6 Limitations and opportunities for future research

In this study, translation has been extremely important, because the participants in both qualitative and quantitative studies were not native to the English language. Although the translators worked to optimize the translations, there are some limitations associated with the translation process employed. First, different versions of translations conducted by different translators might convey different perspectives on the same issue. Second, although bilingual translators made collective decisions to find the best translation, in

some cases, the initial translation was replaced with a more appropriate meaning. Thus, during this process, the translators might have interpreted rather than translated the participant's responses.

This study has adopted a supply-side perspective and has explored managerial views and opinions towards a number of factors that determine the competitive advantage of Taiwan's HTVE institutions. Research undertaken in any context and in a given period of time will always have its limitations as the conditions in which the analysis and interpretation is done may not be the same as when the data were collected. The data for this research were collected in 2003-2005 and while this in itself has its limitations in terms of currency, the analysis provides a snapshot of Taiwan's HTVE sector and a platform for further research in the future. This research explored a series of indicators for measuring institutional performance. It offers a framework for HTVE institutions to create competitive advantage and measure performance. Further research might examine how stakeholders evaluate the quality of their education, and/or compare the similarities and differences between demand and supply-side perspectives. Understanding stakeholders' expectations and levels of satisfaction across the HTVE sector would certainly further inform managerial decisions and aid survival in a competitive market.

In this study, the respondents were senior managers of HTVE institutions in Taiwan. Since this particular sample is both selective and limited in scale, a wider survey may yield more valuable insights into the further development of Taiwan's HTVE sector. Future studies may consider bringing both academic and non-academic administrative staff into the discussion, and comparing viewpoints among different groups. Such a study might obtain a more precise identification of characteristics of successful HTVE institutions.

The study has been restricted to a sample of educational institutions involved in Taiwan's HTVE sector. Empirical examinations of academic universities could be undertaken using the proposed model of competitive advantage. This would further test its applicability and validity. In addition, future cross-sector studies, particularly between Taiwan's HTVE institutions and their counterparts, institutions of higher education (e.g. universities), could be carried out for comparative purposes. The

findings of such research could potentially provide important insights into the differences and similarities between strategic management in different types of higher education institutions.

Identifying and prioritizing the factors determining the competitive advantage of HTVE institutions has assisted in providing an enhanced understanding of strategic planning and management of HTVE institutions. The model developed in this study forms a theoretical foundation for creating and measuring competitive advantage. This model indicates that external industry structure, internal resources, and strategy types serve to contribute to institutional performance with varying degrees of importance. It is expected that this competitive advantage model will be applicable to educational institutions at all levels, particularly to higher general education. However, future studies should be undertaken to validate the applicability of this framework to other educational contexts in Taiwan, and to HTVE sectors in other countries.

Finally, it is acknowledged that the importance of factors of competitive advantage for HTVE institutions may vary over time. The most important current issue may be the least important in the future. It is, therefore, recommended that a longitudinal or periodical study is undertaken to examine the changes in the relative effects of each source on competitive advantage both within and outside the HTVE sector. This suggests that there could be new and additional factors considered as significant contributors to the competitive advantage of HTVE institutions.

9.7 Closing comments

The results of this study provide in-depth insights into how HTVE institutions can be managed to achieve competitive advantage and long-term sustainability. Within the nature and scope of the study, many questions have been raised and many areas have been opened up for further study. It is envisaged that the proposed integrated model of competitive advantage will assist HTVE related government policy-makers in Taiwan to identify the challenges and opportunities that they have, and set broad directions and policies in response to these. The results of this study will also assist senior managers of HTVE institutions in examining their internal resources, identifying environmental trends and constantly adjusting their competitive strategy in line with such trends. The model of competitive advantage for the HTVE sector in Taiwan has also been

established as a generic model, providing an opportunity for other scholars to test the framework in other educational markets. Finally, this study has the potential to contribute to improvements in the strategic management of Taiwan's HTVE sector as a whole.

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APPENDIX

Appendix 1- List of interviewees

No.	Type of institution	Name of institution	Job title
1.	Private	Wu-Feng Institute of Technology	Director of board
2.	Government	Ministry of Education Department of TVE	Senior Specialist
3.	Government	TVE evaluation project	Director
4.	Public	National Taipei University of Technology	Secretary General
5.	Public	National Taipei University of Science & Technology	President
6.	Public	National Taipei University of Technology	President
7.	Public	National Yunlin University of Technology	President
8.	Public	National Huwei University of Science & Technology	Dean of Academic Affairs
9.	Public	National Kaohsiung University of Applied Sciences	President
10.	Public	National Kaohsiung First University of Science & Technology	Vice President
11.	Public	National Kaohsiung Hospitality College	President
12.	Public	National Tainan Institute of Nursing	President
13.	Private	Shu Zen College of Medicine and Management	President
14.	Private	Lunghwa University of Technology	President
15.	Private	Ming-Hsin University of Technology	President
16.	Private	Hung Kuang University	President
17.	Private	Vanung University	Vice President
18.	Private	KunShan University of Technology	President
19.	Private	Shu-Te University	President
20.	Private	Fooyin University	President
21.	Private	Chung Kau Institute of Technology	President
22.	Private	Yu Da College of Business	President
23.	Private	The Overseas Chinese Institute of Technology	President
24.	Private	Ling Tung Institute of Technology	President
25.	Private	Chien Kuo Institute of Technology	President
26.	Private	Hsiuping Institute of Technology	President
27.	Private	Chungchou Institute of Technology	President
28.	Private	Wu-Feng Institute of Technology	President
29.	Private	Tatung Institute of Technology	President
30.	Private	Mei Ho Institute of Technology	President
31.	Private	Dahan Institute of Technology	President
32.	Private	Hwa Hsia College of Commerce and Technology	President

Appendix 2- In-depth interview



**VICTORIA
UNIVERSITY**

**A NEW
SCHOOL OF
THOUGHT**

A. Institutional Performance

The purpose of this section is to understand how an institution allocates its resources to improve its performance and performs better than its counterparts.

1. How is **institutional performance** measured?
2. How would you define **the best institutional performance** in the context of higher technical and vocational education?
3. Do you consider that the results of annual assessment of education quality from the Taiwan Ministry of Education are representative of an institution's competitive advantage?
 - If not, what else do you use, or think are effective measures, for assessing the institution's **competitive advantage**?
 - Why?

B. External industry structure: External factors

The following questions aim to investigate the intensity of competition and determine to what extent it impacts on strategy formulation in the higher technical and vocational education sector:

4. Do you think the entry of a new institution into the higher technical and vocational education market is difficult or easy?
 - Why?

5. And what do you consider to be the **'barriers'** for the entry of a new competitor into this market?
 - How do you identify the **'barriers'** for entry into this market? (*e.g. economics of scale, absolute cost advantage, capital requirements, product differentiation, access to distribution channels, government and legal barriers, retaliation by established producers*)

6. Who/What are the **'customers'** for the institutions of higher technical and vocational education? (*e.g. business enterprises and a variety of industries, the education industry for teachers, postgraduate schools, the army service, students or parents*)
 - What do they want?

7. In the higher technical and vocational education system, it is important to clarify what kinds of products and services an institution offers. In this sense, what do you think the customers are aiming to buy - products, services, or both?
 - If products, what are they? (*For example, a graduate is considered a product if potential buyers are business enterprises, industries or any further studies*)
 - If services, what are they? (*For example, quality of lecture delivery is considered an education service if potential buyers are students*)
 - If both, how to do you determine them? What are they and how do they differ?
 - If neither of these, what is the output?

8. Do senior managers of higher technical and vocational education institutions take any of the customers' wants into account when formulating and implementing strategies with respect to demand?
 - Why?
 - How?

9. What/Who do you think are the ‘**suppliers**’ for the institutions of higher technical and vocational education? (*e.g. government, vocational high school, senior higher school or family*)
- What do they supply? (*e.g. government funding, vocational high school graduates*)
 - How important are they? *Explain why they are so important or not important.*
10. How do you think senior managers of higher technical and vocational education institutions consider the suppliers when formulating and implementing strategy with respect to supply?
- Why do they do it that way?
11. With Taiwan’s entry into the WTO in 2002, foreign institutions of higher education are now allowed to promote their educational services in Taiwan. Do you think that the higher technical and vocational education market is now likely to be more competitive?
- What is the level of competition now? (How competitive?) And how do senior managers of higher technical and vocational education position themselves to face this competition?
 - Who/What do you consider to be the ‘**primary competitors**’ of your institutions within the sector now?
 - Who/What might be the ‘**potential rivals**’ to your institution in the future?
 - How strong will this competition be? Why that strong?
12. Now that Taiwan’s higher technical and vocational education market will need to be more competitive under these new conditions, do you think that there are any ‘**substitutes**’ or ‘**alternatives**’ to higher technical and vocational education?
- If no, why not?
 - If yes, what are these substitutes (alternatives)?

C. Internal resources: Internal factors

13. Could you list some internal factors that you think are most important for creating competitive advantage of an institution? (*e.g. organizational resources, financial resources, marketing capabilities, R&D capabilities, human resources, physical resources*)

- In terms of ‘organizational resources’, what are the aspects you would consider important in creating the competitive advantage of an institution? (*e.g. participating in a self-assessment system, using TQM, organizational climate, president leadership*)
- In terms of ‘financial resources’, what are the aspects you would consider important in creating the competitive advantage of an institution? (*e.g. sources of funding, industrial donations, student tuition, allocation of school financial resources*)
- In terms of ‘marketing capabilities’, what are the aspects you would consider important in creating the competitive advantage of an institution? (*e.g. use of media, print advertisements, community activities involved, education fair, and student clubs*)
- In terms of ‘R&D capabilities’, what are the aspects you would consider important in creating the competitive advantage of an institute? (*e.g. exchange programs, pre-job training programs, certificate test, career development*)
- In terms of ‘human resources’, what are the aspects you would consider important in creating the competitive advantage of an institution? (*e.g. academic publication, co-operation with industries*)
- In terms of ‘physical resources’, what are the aspects you would consider important in creating the competitive advantage of an institution? (*e.g. campus, location, architecture, maintenance, space utilization, atmosphere*)

Appendix 3- Questionnaire survey



**VICTORIA
UNIVERSITY**

**A NEW
SCHOOL OF
THOUGHT**

*We would like to invite you to be part of my PhD study into
“AN EMPIRICAL ANALYSIS OF THE STRATEGIC MANAGEMENT OF
COMPETITIVE ADVANTAGE: A STUDY OF HIGHER TECHNICAL AND
VOCATIONAL EDUCATION IN TAIWAN”.*

Your participation in the study is entirely voluntary. If you feel that the study is intrusive or you are reluctant to answer certain questions, you are able to withdraw at any stage of the questionnaire.

With your participation, it is hoped that a total of 480 senior managers of the total 89 higher technical and vocational institutions will be surveyed. The information given by you will be strictly confidential.

The questionnaire will take approximately 15 minutes to complete. On completion, please return the questionnaire in the reply paid envelope, preferably by 10th December 2004.

Purpose of the study:

- ❖ The purpose of this study is to develop and test a model of competitive advantage for institutions of higher technical and vocational education in Taiwan.
- ❖ It is expected that the proposed model will assist educational institutions in identifying sources of competitive advantage. This will be determined either by industry characteristics or created by the organization itself through the accumulation of intangible and tangible resources and capabilities and through investigating the relative importance of types of sources of competitive advantage on institutional performance.

The significance of the survey:

- ❖ The questionnaire will cover five major areas: external industry structure, internal resources, strategy types, institutional performance, and demographic information.

If you have any queries about the questionnaire or are interested in knowing more about this study, please do not hesitate to contact:

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Fax.05-216-5870 (Taiwan)
Email. Hsun-i.Huang@research.vu.edu.au

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Tel. 613-9919-1320 (Australia)
Fax.613-9919-1064 (Australia)
Email. Linda.Roberts@vu.edu.au

Please indicate your level of agreement or disagreement with each of the following statements. For each statement below, please place a circle (O) on the number that best describes your view.

Level of agreement or disagreement

- 7 = Strongly Agree
- 6 = Agree
- 5 = Slightly Agree
- 4 = Neutral
- 3 = Slightly Disagree
- 2 = Disagree
- 1 = Strongly Disagree

SECTION A.

External industry structure	Strongly Disagree			Neutral			Strongly Agree
1. Threat from foreign institutions of higher education.	1	2	3	4	5	6	7
2. Threat from domestic academic universities.	1	2	3	4	5	6	7
3. Threat from Chinese-based institutions of higher education.	1	2	3	4	5	6	7
4. Threat from private business enterprises.	1	2	3	4	5	6	7
5. The increase in the number of HTVE institutions.	1	2	3	4	5	6	7
6. The decrease in the number of HTVE students.	1	2	3	4	5	6	7
7. The high intensity of competition between institutions.	1	2	3	4	5	6	7
8. The minimum number of students required for the operation of an educational institution.	1	2	3	4	5	6	7
9. The minimum capital required for establishing a new institution.	1	2	3	4	5	6	7
10. The regulations and policies of government on the operation of an educational institution.	1	2	3	4	5	6	7
11. The power of faculties.	1	2	3	4	5	6	7
12. The power of vocational high schools.	1	2	3	4	5	6	7
13. The power of Taiwan Ministry of Education.	1	2	3	4	5	6	7
14. The power of students.	1	2	3	4	5	6	7
15. The power of parents.	1	2	3	4	5	6	7
16. The power of employers.	1	2	3	4	5	6	7

SECTION B.

Internal resources	Strongly Disagree			Neutral			Strongly Agree
17. Personnel staffing.	1	2	3	4	5	6	7
18. Faculty qualifications.	1	2	3	4	5	6	7
19. Job loyalty.	1	2	3	4	5	6	7
20. Team building.	1	2	3	4	5	6	7
21. Leadership.	1	2	3	4	5	6	7
22. Sufficient financial capital.	1	2	3	4	5	6	7
23. Financial planning and budgeting.	1	2	3	4	5	6	7
24. Financial implementation.	1	2	3	4	5	6	7
25. Teaching and research infrastructure.	1	2	3	4	5	6	7
26. Campus facilities.	1	2	3	4	5	6	7
27. Campus location.	1	2	3	4	5	6	7
28. Organizational structure.	1	2	3	4	5	6	7
29. Organizational efficiency.	1	2	3	4	5	6	7
30. Integration of administrative resources.	1	2	3	4	5	6	7
31. Curriculum design.	1	2	3	4	5	6	7
32. Curriculum quality.	1	2	3	4	5	6	7
33. Range of majors and degree programs.	1	2	3	4	5	6	7
34. Participation in government-funded research projects.	1	2	3	4	5	6	7
35. Collaboration with private business enterprises.	1	2	3	4	5	6	7
36. Integration of academic and research resources.	1	2	3	4	5	6	7
37. Strategic alliances with vocational high schools.	1	2	3	4	5	6	7

Internal resources	Strongly Disagree			Neutral			Strongly Agree
38. Partnership with other higher education institutions.	1	2	3	4	5	6	7
39. Media promotion.	1	2	3	4	5	6	7
40. Scholarships and financial aids offered.	1	2	3	4	5	6	7
41. Participation in off-campus activities and events.	1	2	3	4	5	6	7

SECTION C.

Institutional performance	Strongly Disagree			Neutral			Strongly Agree
42. Employment rate of new graduates.	1	2	3	4	5	6	7
43. Percentage of graduates pursuing further studies.	1	2	3	4	5	6	7
44. Pass rate on licensure and certificate exams of students.	1	2	3	4	5	6	7
45. Professional knowledge and capabilities of graduates.	1	2	3	4	5	6	7
46. Staff performance in teaching.	1	2	3	4	5	6	7
47. Staff performance in academic research.	1	2	3	4	5	6	7
48. Staff performance in applied research.	1	2	3	4	5	6	7
49. Practical experience and skills of teaching staff.	1	2	3	4	5	6	7
50. Institutional culture.	1	2	3	4	5	6	7
51. Graduate/alumni evaluations.	1	2	3	4	5	6	7
52. Institutional distinctiveness.	1	2	3	4	5	6	7
53. Community service.	1	2	3	4	5	6	7
54. Holistic education development.	1	2	3	4	5	6	7
55. Professional curriculum development.	1	2	3	4	5	6	7
56. Institutional reputation.	1	2	3	4	5	6	7

Institutional performance	Strongly Disagree			Neutral			Strongly Agree
57. Facilities management.	1	2	3	4	5	6	7
58. Industry-academia collaboration.	1	2	3	4	5	6	7
59. Magazine ranking.	1	2	3	4	5	6	7
60. Industry's evaluation on the quality of graduates.	1	2	3	4	5	6	7

SECTION D.

Please indicate the following statements that best describes the strategy of your institute. For each question, please place only one Circle (O) on the number that best describes your view.

1. In comparison to other institutions, the **Marketing Approach** of my institution is to

Maintain customer base	1	2	3	4	5	6	7	Create changes in customer base
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2. In comparison to other intuitions, the **Product Mix Stability** of my institution is

Very stable	1	2	3	4	5	6	7	Always changing
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3. In comparison to other institutions, the **Market Definition** of my institution is

Narrow	1	2	3	4	5	6	7	Broad
--------	---	---	---	---	---	---	---	-------

4. In comparison to other institutions, the **Competitive Edge** of my institution is

Always have low cost	1	2	3	4	5	6	7	Always more innovative
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5. In comparison to other institutions, the effort and time my institute puts on **Environmental Monitoring** is

Very little	1	2	3	4	5	6	7	Very much
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6. In comparison to other institutions, the **Attitude towards Growth** of my institution is

Very cautious	1	2	3	4	5	6	7	Very aggressive
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7. In comparison to other institutions, the **Customer Base Stability** of my institution is

Very stable	1	2	3	4	5	6	7	Very unstable
-------------	---	---	---	---	---	---	---	---------------

8. In comparison to other institutions, the **Growth Pattern** of my institution is

Always steady	1	2	3	4	5	6	7	Always in spurts
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SECTION E.

Please kindly provide the following information. The information gathered will be kept strictly confidential and will only be used for the research and not for any other reason.

1. Your age: Less than 40 41-50 years old 51-60 years old more than 61 years old
2. Total working experience in educational administration field:
 less than 6 years 6-10 years 11-15 years 16-20 years 21-25 years
 more than 25 years
3. How long have you been working for this institution:
 less than 6 years 6-10 years 11-15 years 16-20 years 21-25 years
 more than 25 years
4. Your position: President Vice- president Dean of Academic Affairs
 Dean of Student Affairs Dean of General Affairs
 Dean of R&D Other _____ (please specify)
5. Your institution: Public Private
6. The type of your institution: University of technology Institute of technology
 College
7. Number of students in your institution (include night and weekend school):
 Less than 3,000 3,001-6,000 6,001-9,000
 9,001-12,000 12,001-15,000 More than 15,000
8. The location of your institution: North Central South
 East



台灣高等技職教育(技專校院) 發展競爭優勢模式之研究

A. 學校績效表現

1. 本研究主要探討高等技專校院如何運用所擁有的內部資產在高等技職教育市場中獲致比競爭者更高的績效表現。如何衡量一所高等技專校院的績效表現?
2. 在高等技職教育體系中，如何定義最佳的績效表現?
3. 你是否認同教育部之例行性評鑑結果可代表一所高等技專校院的競爭優勢? (包含行政類和專業類群的總體指標)
 - ◆ 如果不是, 你認為還有哪些其他方法/指標可更精確的衡量技專校院的競爭優勢?
 - ◆ 為什麼?

B. 外在產業結構:外在因素

下列問題主要探討高等技職教育產業競爭強度及衡量高等技職教育產業衝擊對策略規劃之影響:

4. 若有新的技專校院欲加入台灣高等技職教育市場, 你認為是困難或容易
 - ◆ 為什麼?
5. 若有新的技專校院欲進入高等技職教育市場，其“障礙”是什麼?
 - ◆ 你如何定義進入高等技職教育市場的“障礙”? (例如: 經濟規模, 絕對成本優勢, 資本條件, 產品差異, 通路分布, 政府和法律障礙或現有校院的反制)
6. 對高等技專校院而言，誰是“顧客”? (例如: 公司企業, 教師行業, 研究所, 自願役軍旅, 學生或家長)
 - ◆ 什麼是顧客所期望的?

7. 在高等技職教育體系中，了解高等技專校院所供應的產品或服務是重要的。在此認知下，你認為高等技專校院的顧客主要是購買產品、服務或兩者皆是？
 - ◆ 如果是購買產品的話，產品包括哪些？(例如：如果購買者是公司企業或研究所，則畢業生可視為一種產品)
 - ◆ 如果是購買服務的話，服務包括哪些？(例如：如果購買者學生，則教學品質可視為一種服務)
 - ◆ 如果是同時購買產品和服務，那各為什麼？差異在哪裡？
 - ◆ 若兩者皆非，那什麼是產出？

8. 你認為高階決策主管在規劃和運用策略時，是否將顧客需求列入考慮？
 - ◆ 為什麼？
 - ◆ 如何依據？

9. 對高等技專校院而言，你認為誰是“供應者”？(例如：政府，高職，高中，或家庭)
 - ◆ 他們供應些什麼？(例如：政府補助款項，高職畢業生來源)
 - ◆ 這些供應者重要嗎？請解釋他們的重要性與否？

10. 你認為高階決策主管在規劃和運用策略時，是否將供應者列入考慮？
 - ◆ 為什麼高階決策主管要這麼做？

11. 隨著台灣加入 WTO 後，未來外國高等教育機構將可在台招生。在此情況之下，你是否亦認為台灣高等技職教育市場會更加競爭？
 - ◆ 目前高等技職教育市場競爭到何種程度？身為高階決策主管該如何面對此競爭的環境？
 - ◆ 你認為目前台灣高等技專校院中，誰是貴校“主要競爭者”？
 - ◆ 在未來，誰將是貴校“潛在競爭者”？
 - ◆ 你認為高等技職教育市場未來會更競爭嗎？為什麼會如此競爭呢？

12. 如果未來台灣高等技職教育更為競爭，你認為會有哪些“替代品”或“可供選擇的方案”取代現有的高等技職教育嗎？
 - ◆ 如果沒有，為什麼？
 - ◆ 如果有，是這些替代品或可供選擇的方案？

C. 內部資源: 內在因素

13. 可否指出哪些學校內部要素能創造高等技專校院之競爭優勢? (例如: 組織資源、財務資源、行銷能力、研發能力、人力資源、硬體設施等)
- ◆ 組織方面, 你認為哪些是可創造技專校院競爭優勢的重要因素? (參與自我評鑑制度、建立全面品質管理、組織氣候、校長領導力)
 - ◆ 財務資源方面, 你認為哪些是可創造技專校院競爭優勢的重要因素?(資金來源、企業捐款、學費、學校財務資金分配)
 - ◆ 行銷能力方面, 你認為哪些是可創造技專校院競爭優勢的重要因素?(媒體運用、平面廣告、社區活動參與、教育展、學生社團)
 - ◆ 研發能力方面, 你認為哪些是可創造技專校院競爭優勢的重要因素?(交流學程、職前訓練、證照考試、職涯規劃)
 - ◆ 人力資源方面, 你認為哪些是可創造技專校院競爭優勢的重要因素?(學術發表、產學合作)
 - ◆ 硬體設施方面, 你認為哪些是可創造技專校院競爭優勢的重要因素?(學校地理位置、建築物、維修、空間利用、校園氛圍)

Appendix 5- Questionnaire survey (Chinese Version)



**VICTORIA
UNIVERSITY**

**A NEW
SCHOOL OF
THOUGHT**

各位教育界前輩、先進，您好：

我們竭誠邀請您參與『**台灣高等技專校院發展競爭優勢模式**』之博士論文研究！

本學術研究問卷採匿名自願方式填寫，如果您對這份問卷感到不信任或不願回答，您可以拒絕填寫或隨時中斷填寫。

填答此份問卷約十五分鐘。請您於 **12月1日**前填寫完成，並以回郵信封寄回。

本研究『台灣高等技專校院發展競爭優勢模式』所設計之問卷，主要研究對象為全台灣 89 所技專校院之 480 位高階決策主管。填答資料將完全保密，請您放心作答。

本研究目的：

- 期望建構台灣高等技專校院發展競爭優勢之模型。
- 期望提供高等技專校院創造競爭優勢之來源－產業外在環境或內部組織資源，並進一步了解不同競爭優勢來源對學校績效表現之重要性。

本調查之重要性：

- 本問卷主題將分為五大部分：外在產業結構、內部資源、策略型態、績效表現以及個人基本資料。

誠摯感謝您的參與！如果您有任何疑問或對本研究有更進一步的興趣，歡迎您與我們聯繫。

澳洲維多利亞大學

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針對下列問題，請您仔細閱讀後，在每一題目右邊的七個數字中圈選(○)一個符合您看法的答案。

同意或不同意的程度

- 7 = 非常同意
- 6 = 同意
- 5 = 稍微同意
- 4 = 無意見
- 3 = 稍微不同意
- 2 = 不同意
- 1 = 非常不同意

A:外部產業結構

	非常不同意			無意見			非常同意
1. 市場威脅來自於國外高等教育機構。	1	2	3	4	5	6	7
2. 市場威脅來自於國內一般普通大學。	1	2	3	4	5	6	7
3. 市場威脅來自於中國大陸高等教育機構。	1	2	3	4	5	6	7
4. 市場威脅來自於私人企業(提供相關技能訓練或進修課程)。	1	2	3	4	5	6	7
5. 高等技專校院數量增加。	1	2	3	4	5	6	7
6. 高等技專校院學生來源減少。	1	2	3	4	5	6	7
7. 高等技專校院彼此間競爭激烈。	1	2	3	4	5	6	7
8. 維持學校營運之最小學生人數規模。	1	2	3	4	5	6	7
9. 成立新學校之最小資本條件。	1	2	3	4	5	6	7
10. 政府對學校營運之政策與規範。	1	2	3	4	5	6	7
11. 學者對任教之高等技專校院議價能力。	1	2	3	4	5	6	7
12. 高中職學校對高等技專校院的議價能力。	1	2	3	4	5	6	7
13. 教育部對高等技專校院的議價能力。	1	2	3	4	5	6	7
14. 學生對高等技專校院的議價能力。	1	2	3	4	5	6	7
15. 學生家長對高等技專校院的議價能力。	1	2	3	4	5	6	7
16. 企業雇主對高等技專校院的議價能力。	1	2	3	4	5	6	7



B: 內部資源

	非常不同意			無意見			非常同意
17. 人員配置。	1	2	3	4	5	6	7
18. 教師資格。	1	2	3	4	5	6	7
19. 工作向心力。	1	2	3	4	5	6	7
20. 團隊建立。	1	2	3	4	5	6	7
21. 決策領導。	1	2	3	4	5	6	7
22. 財務資源充裕。	1	2	3	4	5	6	7
23. 財務與預算規劃。	1	2	3	4	5	6	7
24. 財務運用執行。	1	2	3	4	5	6	7
25. 教學研究設備。	1	2	3	4	5	6	7
26. 校園設施。	1	2	3	4	5	6	7
27. 學校地理位置。	1	2	3	4	5	6	7
28. 組織管理架構。	1	2	3	4	5	6	7
29. 組織效率。	1	2	3	4	5	6	7
30. 校內行政資源整合。	1	2	3	4	5	6	7
31. 課程規劃與設計。	1	2	3	4	5	6	7
32. 課程品質。	1	2	3	4	5	6	7
33. 提供多選擇性的系科、課程和學制。	1	2	3	4	5	6	7
34. 參與政府部門之大型研究計畫。	1	2	3	4	5	6	7
35. 與私人企業合作計畫。	1	2	3	4	5	6	7
36. 整合學術與研究資研。	1	2	3	4	5	6	7
37. 與高中職進行策略聯盟。	1	2	3	4	5	6	7

	非常不同意		無意見			非常同意	
38. 和其他高等大專校院跨校合作。	1	2	3	4	5	6	7
39. 媒體宣傳。	1	2	3	4	5	6	7
40. 提供獎學金或獎勵就學方案。	1	2	3	4	5	6	7
41. 參與校外活動。	1	2	3	4	5	6	7

C: 學校績效表現

	非常不同意		無意見			非常同意	
42. 畢業生的就業率。	1	2	3	4	5	6	7
43. 畢業生的升學率。	1	2	3	4	5	6	7
44. 學生專業證照取得率。	1	2	3	4	5	6	7
45. 畢業生專業能力。	1	2	3	4	5	6	7
46. 教師教學表現。	1	2	3	4	5	6	7
47. 教師學術研究表現。	1	2	3	4	5	6	7
48. 教師技術研究發展表現。	1	2	3	4	5	6	7
49. 教師專業實務經驗與能力。	1	2	3	4	5	6	7
50. 學校文化。	1	2	3	4	5	6	7
51. 對校友評價。	1	2	3	4	5	6	7
52. 學校特色成果。	1	2	3	4	5	6	7
53. 社會/社區服務成果。	1	2	3	4	5	6	7
54. 通識教育課程規劃。	1	2	3	4	5	6	7
55. 專業課程規劃。	1	2	3	4	5	6	7

請接續第 4 頁

	非常不同意			無意見			非常同意
56. 學校總體聲望。	1	2	3	4	5	6	7
57. 硬體設施管理。	1	2	3	4	5	6	7
58. 產學合作成果。	1	2	3	4	5	6	7
59. 雜誌排名。	1	2	3	4	5	6	7
60. 企業主對畢業生評價。	1	2	3	4	5	6	7

D: 策略型態

請您評估下列各題問項，並圈選出與貴校實際情況最接近者；若您覺得與其他技專校院非常相似，請圈選『4』。

- 我個人覺得與其他技專校院比較，本校在高等技職教育市場發展上著重於—

強調現有市場顧客維繫	1	2	3	4	5	6	7	強調不斷開拓新市場
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- 我個人覺得與其他技專校院比較，本校在高等技職教育服務運作上傾向於—

提供具穩定性的服務	1	2	3	4	5	6	7	提供具變化性的服務
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- 我個人覺得與其他技專校院比較，本校所提供之高等技職教育服務範圍—

窄	1	2	3	4	5	6	7	寬
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- 我個人覺得與其他技專校院比較，本校在高等技職教育市場具備相當的競爭來源為—

追求低成本	1	2	3	4	5	6	7	追求創新
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- 我個人覺得與其他技專校院比較，本校在監測技職教育市場環境的變遷所投入的時間與心力—

非常少	1	2	3	4	5	6	7	非常多
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- 我個人覺得與其他技專校院比較，本校對於高等技職教育市場之經營態度為—

慎重小心	1	2	3	4	5	6	7	積極且願意承擔風險
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- 我個人覺得與其他技專校院比較，本校對於高等技職教育客群穩定性為—

非常穩定	1	2	3	4	5	6	7	非常不穩定
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- 我個人覺得與其他技專校院比較，本校在高等技職教育市場之成長型態傾向於—

穩定中發展	1	2	3	4	5	6	7	不斷衝刺
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請接續最後一頁

E: 基本資料

以下基本資料純粹為研究用途，絕對保密。

1. 您的年齡: 40 歲以下 41-50 歲 51-60 歲 61 歲以上。
2. 在教育界擔任行政工作經驗共: 少於 6 年 6-10 年 11-15 年 16-20 年 21-25 年
 25 年以上。
3. 目前在該校共服務: 少於 6 年 6-10 年 11-15 年 16-20 年 21-25 年 25 年以上。
4. 您現在的職稱: 校長 副校長 教務長
 學務長 總務長 研發長/技合處處長
 其他 _____ (請詳述)
5. 貴校屬於: 公立 私立
6. 貴校為: 科技大學 技術學院 專科
7. 貴校學生總數約 (包含日間部、進修部、進修學院和在職專班):
 少於 3,000 人 3,001-6,000 人 6,001-9,000 人
 9,001-12,000 人 12,001 人以上
8. 貴校所在地: 北 中 南 東

本問卷至此結束，非常感謝鈞長之協助和參與。

請用回郵信封，將本問卷寄至:
600 嘉義市中山路 57 號
黃薰毅 收