Analysing Existing Saudi Arabian University Admission Criteria for Accounting Programs

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Abstract

This research was motivated by the significant role played by effective admission criteria in predicting academic performance, particularly in Saudi Arabian accounting programs. The primary objective of this research is to investigate the appropriateness of Saudi Arabian university admission criteria for undergraduate and postgraduate accounting programs.

First, for the bachelor accounting program, this research aims to explore how well existing admission criteria—which test different dimensions of prior knowledge—predict academic performance of accounting students based in Saudi Arabia. It evaluates the validity of the High School Grade Point Average (HSGPA) and College Entrance Exam (CEE)—that is, the General Aptitude Test (GAT) and Achievement Test (AT)—to predict student performance in the Preparatory Year Program (PYP), along with first-year core courses in the accounting program and First Year Grade Point Average (FYGPA) and overall Grade Point Average (GPA) of students at the end of the degree. It also examines how the business college PYP predicts performance in the first year, and overall student GPAs at the end of the degree. The role of gender as a moderator in these relationships is considered. This investigation is based on prior knowledge theory (PKT), which is characterised as a multidimensional, hierarchical entity comprised of various types of knowledge and skills.

Tied to the above, for the Master of Accounting program, this research aims to evaluate how effectively one admission criterion predicts the relative academic performance of accounting students in Saudi Arabia. Specifically, it examines the impact of English language proficiency—as measured by International English Language Testing System (IELTS) scores—on the relative performance of Saudi Master of Accounting students in more versus less conceptually oriented accounting courses. This investigation is informed by cognitive load theory (CLT), which addresses the challenge of processing complex cognitive tasks with multiple interactive information elements.

The findings demonstrated that when used as sole predictors, the explanatory variables (HSGPA, GA, and AT) all had statistically significant positive correlations with the dependent variables related to predicting academic performance. Multiple regression

analyses indicated that HSGPA was the strongest incremental predictor of academic performance, whereas GAT was the weakest, showing no significant incremental predictive power in most cases. This study demonstrates that HSGPA is the strongest predictor of both short- and long-term college outcomes in particular accounting disciplines. Further, the results consistently imply that the individual courses and GPA of the PYP in the business college have predictive value for academic performance. Additionally, the results indicate that gender does moderate the relationship between admission criteria and PYP and academic performance, which is significant in many cases. Last, the results show that English language proficiency measured by the IELTS alone has no significant direct effect on the relative academic performance of Saudi accounting students.

Several implications can be drawn from this research for stakeholders and policy makers. It raises questions about the continued use of GAT score as an entry criterion and strongly supports gender-based differential entry criteria. In addition, it provides insight into the efficacy of the PYP.

Student Declaration

I, Yazeed Mohammed A. Alboty, declare that the PhD thesis entitled ‘Analysing Existing Saudi Arabian University Admission Criteria for Accounting Programs’ is no more than 80,000 words in length, including quotes and exclusive of tables, figures, appendices, bibliography references and footnotes. This thesis contains no material that has been submitted 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.

I have conducted my research in alignment with the Australian Code for the Responsible Conduct of Research and Victoria University’s Higher Degree by Research Policy and Procedures.

Signature:  Date: 01/11/2024

Ethics Declaration

All research procedures reported in the thesis were approved by the VU Human Research Ethics Committee, No. HRE22-009 & HRE22-010.

Signature:  Date: 01/11/2024

Dedication

To my father Soul 'Mohammed Abdullah Alboty'

I wish you were here to witness and share this time with me.

I hope you rest in peace and may Allah grant you a place in paradise.

Acknowledgments

IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL

Praise be to Allah and blessings and peace be upon the most honourable creatures and messengers of our master Muhammad—may Allah bless him and grant him peace—praise be to Allah who has helped me to conduct this research.

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This thesis was proofread by Elite Editing in accordance with Australian Standards for Editing Practice (Standards D and E).

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List of Abbreviations

AACSB	Association to Advance Collegiate Schools of Business
ACT	American College Test
ANCOVA	Analysis of covariance
ANOVA	Analysis of variance
AQF	Australian Qualifications Framework
AT	Achievement Test
ATAR	Australian Tertiary Admission Rank
BA	Bachelor of Arts
BBA	Bachelor of Accounting
BSc	Bachelor of Science and Social Science
CBA	College of Business Administration
CBE	College of Business and Economics
CEE	College Entrance Exam
CEP	College English Language Programs
CGPA	College Grade Point Average
CLT	Cognitive load theory
CPA	Certified Public Accountant
DK	Declarative knowledge
DoFS	Diploma of Foundation Studies
EAP	English for Academic Purposes
EFL	English as a Foreign Language
EMI	English Medium Instruction
ENL	English as a Native Language
ESL	English as a Second Language
ETEC	Education and Training Evaluation Commission
FYGPA	First-year Grade Point Average
FSGPA	First-semester Grade Point Average
GAAP	Generally Accepted Accounting Principles
GAT	General Aptitude Test
GDP	Gross Domestic Product
GER	Gross Enrolment Ratio

HSGPA	High school Grade Point Average
IAESB	International Accounting Education Standards Board
IELTS	International English Language Testing System
IES	International Education Standards for Professional Accountant
IFRS	International Financial Reporting Standards
KAU	King Abdul Aziz University
KKU	King Khalid University
KSU	King Saud University
LC	Less conceptually
MA	Master of Arts
MC	More conceptually
MPC	Multiple pairwise compression
MSc	Master of Science
NCA	National Centre for Assessment
NCAHE	National Center for Assessment in Higher Education
OECD	Organisation for Economic Co-operation and Development
PhD	Doctor of Philosophy
PK	Procedural knowledge
PKT	Prior knowledge theory
PYP	Preparatory Year Program ,
PYPGPA	Preparatory Year Program Grade Point Average
QU	Qassim University
SAA	Saudi Accounting Association
SAT	Scholastic Aptitude Test
SELP	Standardised English Language Proficiency
SES	Socioeconomic Status
SOCPA	Saudi Organisation for Certified Public Accountants
SweSAT	Swedish Scholastic Assessment Test
SYGPA	Second-year Grade Point Average
STEM	Science technology engineering and mathematics
TAFE	Technical and Further Education
TOEFL	Test of English as a Foreign Language
PDT	Transition Test
UAE	United Arab Emirates

UK	United Kingdom
USA	United States of America
PSU	University Selection Test
VU	Victoria University
WAM	Weighted-average mark
WM	Working memory

Chapter 1: Introduction

1.1 Background and Motivation

Higher education in Saudi Arabia has experienced remarkable growth in recent years, largely due to an increase in the number of students pursuing higher education (Subbarayalu & Al Kuwaiti, 2018). According to the World Bank Group (2020), in 2018, there were 1.8 million students enrolled in Saudi Arabia's universities and colleges, compared to approximately 1 million in 2011 and 1.06 million in 2013. The Gross Enrolment Ratio (GER) in Saudi Arabia's tertiary education sector was 70.6% in 2020, an increase of more than 6% annually since 2012 (World Development Indicators, 2022). Higher education in Saudi Arabia now has a GER of over 50%, which has reached a universal level (Ryan, 2023). Private education enrolment rates are similar to those in public education. It is estimated that between 2001 and 2019 Saudi Arabia's private sector in tertiary education grew by 74.7% on an annual basis. (World Bank Group, 2020). Between 2016 and 2020, private higher education enrolments increased by 15%, outpacing the public sector by an average of 0.4% per year (World Bank Group, 2022). Despite an increase in enrolments and number and ranking of Saudi educational institutions, higher education in Saudi Arabia faces challenges associated with a rapidly growing youth population and a high rate of youth unemployment.

In such circumstances, there is a high level of competition among students for admission. There has also been an increase in the number of universities and colleges in recent years, primarily due to an increase in demand for post-secondary education (Alghamdi & Al-Hattami, 2014; Hamdan, 2017). Saudi government officials formally stated in their *Ninth National Development Plan* (2010-2014) that the higher education system must focus on preparing professional graduates able to assist with Saudi Arabia's ambitious multi-billion-dollar development projects (Bashehab, 2013; Ministry of Economy and Planning, 2010). Undoubtedly, this reflects an increased demand for higher education in Saudi Arabia. The government has made significant investments in higher education, such as through increased research and new universities (Clark, 2014). Its objectives include increasing tertiary enrolments and accommodating surging demand, driven in part by population growth. Saudi Arabia's budget indicates that education is the government's largest investment sector.

Tied to the above, the Saudi Ministry of Education (2016) has refocused its attention on the quality of educational outcomes over quantity to ensure that Saudi Arabian public education students have the necessary skills and knowledge to participate in a globalised society and to address the complexities that globalisation brings, while maintaining the Islamic values and ideology underlying Saudi society (Allmnakrah & Evers, 2020). This aligns with Saudi Arabia's Vision 2030 of developing both the population and the country by focusing on developing education equal to that of other developed countries. The country's economic development will benefit from the provision of highly educated employees; education is therefore an integral element of Vision 2030. Vision 2030's main objective is to ensure that Saudi Arabia transitions smoothly from an oil-dependent economy to a knowledge economy that focuses on high levels of expertise, creativity and productivity (Alhazmi et al., 2024). The transition is expected to have profound implications for the political and social development of the country (Nurunnabi, 2018). Furthermore, privatizing the public sector to facilitate development constitutes an integral element of Vision 2030 (Alhazmi et al., 2025). Vision 2030 also aims to adapt to rapid market changes. It encompasses many facets of which the most significant is the development of a highly regarded educational system, with a view to building more business groups to address global challenges. Vision 2030 promotes establishing partnerships with other countries in the educational, economic and medical arenas (Al-Zahrani & Rajab, 2017).

Vision 2030's educational goals include (i) minimising the gap between the outputs of tertiary education and the actual needs of local labour markets; (ii) having at least five Saudi universities being listed among the top 200 ranked universities worldwide; and (iii) improving graduate commensurate with world standards (Saudi Arabia's Vision 2030, p. 40). These ambitious goals create a competitive environment among Saudi universities, resulting in them improving their educational systems and outputs. Therefore, it is essential to establish clear and robust admission criteria to achieve these improvements. Also, it is critical that these criteria are characterised by equal opportunity and integrity, ensuring that the selection process is fair and transparent. To ensure student academic success, it is essential to have well-defined admission criteria that align with Vision 2030. An effective admissions method will lead to the selection of the right students who are more likely to succeed academically, thereby contributing to the overall performance and reputation of Saudi universities.

This research is motivated by the following four key factors.

First, multiple tertiary admission criteria in Saudi Arabia

In Saudi Arabia, universities are facing the challenge of high university attrition rate. For instance, Imam Muhammad Ibn Saud University had only around half of its students graduating from 2000 to 2010 (Alanazi, 2014). Researchers (for example, Al-Twaijry, 2010) suggest that better admission procedures and stricter admission criteria help to identify students who are likely to fail or withdraw from university, and hence enhance the overall success and quality of higher education. In response, the Saudi government retained strict control over virtually every aspect of higher education from 2003 to 2011, including the number of students to be enrolled and student admission procedures (Al-Eisa & Smith, 2013; Alkhazim, 2003). The General Aptitude Test (GAT) and Achievement Test (AT) were also launched in 2004 as admission criteria in addition to the commonly used High School Grade Point Average (HSGPA) (Alshumrani, 2007).

The review of literature (see Section 3.5) based in Saudi Arabia indicates that none of prior studies have specifically investigated and analysed the three admission criteria (HSGPA, GAT & AT) in regard to their ability to predict the academic performance of accounting students. This research addresses the gap by investigating alternative measures of the academic ability of a single cohort of students as alternative selection criteria for university accounting program selection. This study responds to calls for more discipline-based empirical research (Abdelfattah et al., 2022; Alghamdi & Al-Hattami, 2014; Alnahdi, 2015; Alshammari, 2020) in Saudi Arabia. The study will provide timely evidence of the effectiveness of different tertiary admission criteria in Saudi Arabia and allows assessment of which type of prior knowledge (as defined by prior knowledge theory [PKT]) is the most appropriate admission criteria for university selection.

Second, Saudi universities' Preparatory Year Program (PYP)

Transitioning from high school to university can be challenging for students who are unprepared academically (Parker et al., 2004; Perry et al., 2001). A growing concern has been raised regarding the transition from high school to college (Porter & Polikoff, 2012) in developed countries, such as the United States of America (USA), for example, Perna (2024) argued that many high school students in the USA graduate without adequate academic preparation for higher education. In Saudi Arabia, similar concerns have also

been raised by researchers. For example, several studies have shown that many high school graduates are unprepared for college (AlMoshari & AlSaud, 2012; Alnatheer, 2009). For example, many students in undergraduate programs are found to be lacking in mathematical skills (Al-Amri & Awaji, 2023; AlHarbi, 2012; Khoshaim & Ali, 2015a; Khoshaim et al., 2018). This makes it apparent that they will not be able to learn college-level mathematics (Khoshaim & Ali, 2015b). In response, business colleges in Saudi Arabia introduced the Preparatory Year Program (PYP) in 2010 to require students to pass this program on admission to university. The PYP is offered through business colleges and is comprised of one semester of courses in mathematics, statistics and academic skills (see Section 2.6.1). However, few research has examined the impact of the PYP on the academic performance of accounting students (see Section 3.5.4). This research will address the gap by examining the impact of the PYP on the academic performance of accounting students as measured by the results in first-year core courses, the First Year Grade Point Average (FYGPA) and overall Grade Point Average (GPA).

Third, Saudi Arabia's unique gender segregated educational system

A feature unique to the Saudi Arabian education system is that all students, teachers, workers and school leaders in an educational institution are from the same gender (Barry, 2019; Hamdan, 2005). The educational system remains gender segregated, with women predominantly enrolled in colleges and universities devoted to women. This is because traditionally, Saudi females were not treated as equal to males. Saudi Arabia's Vision 2030 aims to provide equal opportunities for all Saudi citizens. In particular, it draws attention to the right of Saudi women to have equal opportunities in education and the workforce. This is evidenced in Vision 2030 (p. 37) which states that

> with over 50 percent of our university graduates being female, we will continue to develop their talents, invest in their productive capabilities and enable them to strengthen their future and contribute to the development of our society and economy.

The relationship between academic achievement and gender has been the subject of many studies in a range of disciplines and countries (e.g., Eskew & Faley, 1988; Opstad, 2023; Opstad & Årethun, 2020; Syukur, 2021; Tyson, 1989), including the Saudi context (Abdelfattah et al., 2022; Al-Amri & Awaji, 2023; Alshammari, 2020; El-Moussa et al., 2021). However, few has been done in the accounting education context in Saudi Arabia

(see Section 3.5.3). This study responds to the call by Saudi scholars (Almulhim, 2021; Alnahdi & Schwab, 2023; Vista & Alkhadim, 2022) for more research into the relationship of gender and academic performance. The study will examine whether gender moderates the relationships between HSGPA, GAT and AT and PYP and first-year core courses, FYGPA and overall GPA in the accounting program.

Fourth, the emergence of English Medium Instruction (EMI) in Saudi universities

Saudi universities are pressured to internationalise their educational programs in line with the goals outlined in Vision 2030. As noted by Al-Thubaiti (2019), many Saudi students recognise English as a crucial language for examinations. The importance of English language proficiency also extends to commerce. As described by Elyas and Picard (2013) and Barnawi (2022), English has recently gained increased prominence in higher education institutions in Saudi Arabia. There has been a growing number of educational institutions in Saudi Arabia have implemented English Medium Instruction (EMI) in their curricula to meet the increasing demand for English language skills, particularly in academia, where English is the language of instruction (Alqarni et al., 2024; Oraif & Alrashed, 2022). The transition to EMI is aligned with the ongoing economic and social changes in Saudi Arabia under the Saudi Arabia's Vision 2030 (Al-Amri & Awaji, 2023). For example, the Saudi Ministry of Investment aimed to impose restrictions requiring international companies to establish regional headquarters in Saudi Arabia by 2024. It is expected that these changes will create many employment opportunities for Saudi citizens. It is therefore essential that they are well prepared and equipped with competitive skills, including proficiency in the English language. Another factor is the desire to improve Saudi universities' international rankings (Tsou & Kao, 2017).

Although the use of EMI in Saudi Arabia is growing rapidly (Al-Amri & Awaji, 2023), little research has been conducted on the impact of students' English language proficiency on their achievement in EMI courses (Al-Amri & Awaji, 2023), particularly in the context of business colleges (Alqarni et al., 2024). The current research attempts to fill this gap by investigating the impact of English language proficiency measured by IELTS score on the relative performance of accounting students in more conceptual (MC) versus less conceptual (LC) accounting courses (see Section 1.6 for the definitions of MC and LC).

1.2 Research Objectives and Questions

The primary objective of this research is to investigate the predictive power of different university admission criteria in predicting the academic performance in Saudi undergraduate and postgraduate accounting programs. The choice of business students is determined by the fact that business colleges have the most student enrolments in Saudi universities (Al-Nassar et al., 2022). Moreover, business colleges are accessible to both men and women (Alsudairi, 2015; Sian et al., 2020), unlike the traditionally gender-dominant colleges such as engineering (male) and nursing (female) (Alghamdi et al., 2018; Labib et al., 2021). The business colleges from which the present research draws its sample (the College of Business and Economics [CBE] at Qassim University [QU]), along with the College of Business Administration (CBA) at King Saud University (KSU) are among the few Saudi business colleges to be accredited by the prestigious Association to Advance Collegiate Schools of Business (AACSB). The CBE and CBA are therefore expected to design their admission criteria degree programs to ensure that high-quality learning outcomes are achieved, in accordance with the AACSB standards for degree program structures and design standards (AACSB, 2018).

The choice of accounting discipline is a result of the growing popularity of this discipline among Saudi students (Al-Nassar et al., 2022). This interest is driven by the potential increase in demand in the job market for qualified national graduates in those specialisations as a result of Saudi government initiatives to develop the financial sector (Grand & Wolff, 2020), along with new regulations intended to increase Saudi professional participation in the accounting profession (Saudi Gazette, 2020).

The overarching research question seeks to theoretically and empirically determine the validity of various admission criteria for predicting the academic performance of accounting students in Saudi Arabia. More specifically, this research addresses five research objectives (ROs) and eight research questions (RQs).

RO1: To evaluate the validity of the HSGPA and College Entrance Exam (CEE; i.e., GAT & AT) for predicting student performance in the PYP, focusing on mathematics, statistics and academic skills.

RO2: To evaluate the validity of the HSGPA and CEE (GAT & AT) for predicting student performance in first-year core courses, FYGPA and overall GPA in the accounting program.

RO1 and RO2 will investigate the predictive ability of the admission criteria HSGPA and GAT and AT regarding the academic performance of accounting students at Saudi Arabian universities. Studies in many countries reveal that both the HSGPA and CEEs are important predictors of student performance at university level (e.g., Bai et al., 2014; Crowther & Briant, 2021; Qahmash et al., 2023; Shaw et al., 2011; Vista & Alkhadim, 2022; Westrick et al., 2019; Zwick, 2023). Some literature indicates that the HSGPA is a better predictor of future academic performance and is more reliable than CEEs or any other approach (Alhurishi et al., 2021; Alnahdi, 2015; Alshammari, 2020; Geiser & Santelices, 2007; Molontay & Nagy, 2023; Nagy & Molontay, 2021; Warren & Goins, 2019), while other research indicates that the validity of predicting academic performance is increased by using admission test results such as the Scholastic Aptitude Test (SAT; e.g., Al-Hattami, 2012; Bettinger et al., 2013; Camara & Echternacht, 2000).

Tied to the above, narrowing the scope to the field of the accounting education, where this research is focused. The field of accounting education has received considerable attention from researchers in developed nations (see Section 3.2.4). The topic of accounting education has been the subject of numerous studies (e.g., Al-Anazi, 2012; Farley & Ramsay, 1988; Papageorgiou & Halabi, 2014; Xiang & Hinchliffe, 2019) revealing a positive association between the HSGPA and accounting academic performance. Other studies (e.g., Carpenter & Roos, 2021; Eskew & Faley, 1988; Farley & Yang, 2020) show a positive correlation between CEE scores and accounting academic performance. However, in developing countries such as Saudi Arabia, research into accounting education is still far behind (Al-Nassar et al., 2022; Al-Twaijry, 2010), especially in regard to prediction of the academic performance of accounting students (see Section 3.5). Therefore, to address RO1 and RO2, this research seeks to answer the following research questions:

> **RQ1**: Does the HSGPA predict academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program?

RQ2: Does the GAT score predict academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program?

RQ3: Does the AT score predict academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program?

RQ4: How much explanatory power is lost in predicting academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program if a subset of the current admission criteria is used?

RO3: To evaluate how the business college PYP predicts performance in first-year core courses, FYGPA and overall GPA in the accounting program.

RO3 aims to examine the predictive ability of the PYP regarding the academic performance of accounting students. It is imperative to provide remedial courses and programs to students enrolled in higher education institutions for them to meet college readiness standards. To address RO3, this research seeks to answer the following research questions:

RQ5: Do individual courses in the PYP and the Preparatory Year Program Grade Point Average (PYPGPA) in the CBE predict performance in first-year core courses, the FYGPA and overall GPA in the accounting program?

RQ6: Do any individual courses in the PYP add to or out-perform the PYPGPA in predicting performance in first-year core courses, FYGPA and overall GPA in the accounting program?

RO4: To examine whether gender acts as a moderator of the relationships between the HSGPA, GAT and AT and each of the PYP and first-year core courses, FYGPA and overall GPA in the accounting program.

RO4 aims to examine whether gender influences the relationships between the explanatory and predicted variables. In Saudi Arabia, gender is a unique situation because of culture and religion. Males and females are segregated in the education system from the elementary to tertiary level (see Sections 1.1, 2.4 & 4.4.3). Indeed, gender separation extends beyond educational settings to every aspect of public life (Barry, 2019; Van Geel, 2016). Although Saudi Arabia's Vision 2030 aims to empower women and increase their

social contributions, gender segregation among students remains persistent. Thus, it is imperative that academic differences between genders be investigated to better understand and address these disparities. To address RO4, this research seeks to answer the following research question:

> **RQ7**: Does gender moderate the relationships between the HSGPA, GAT and AT and each of the PYP and first-year core courses, FYGPA and overall GPA in the accounting program?

RO5: To evaluate the validity of English language proficiency as measured by IELTS score as an admission criterion in predicting relative performance of Saudi Arabian accounting students in more versus less conceptually oriented accounting courses.

RO5 aims to evaluate the power of English language proficiency as measured by IELTS score for predicting the relative performance of accounting students in Saudi Arabia. To address RO5, this research seeks to answer the following research question:

> **RQ8**: Does English language proficiency as measured by the IELTS score of Saudi students affect relative performance in two types of accounting course, more conceptually oriented courses versus less conceptually oriented courses, taught in English?

1.3 Theoretical Framework

The central objective of this research is to analyse current admission criteria in relation to predicting Saudi students' performance in accounting programs. Specifically, it examines the admission requirements for two levels of study in accounting programs in Saudi Arabia—bachelor and master degrees—which have different admission criteria. Therefore, this research integrates prior knowledge theory (PKT) with cognitive load theory (CLT) as a central framework for the study (see Sections 4.2 and 4.3).

Prior studies have highlighted the important role that prior knowledge plays in the development of schemas. Bryant and Hunton (2000) emphasised that prior subject knowledge is necessary for effective learning, as new information must be integrated into existing schemas to establish meaningful connections. The impact of prior accounting education on university-level accounting learning has been demonstrated in previous

studies (Farley & Ramsay, 1988; Keef & Hooper, 1991; Rohde & Kavanagh, 1996, see Section 3.3.8). In line with PKT, prior knowledge plays a crucial role in both the learning process and performance. More so, the type of prior knowledge (declarative or procedural) that impacts sequential learning performance is critical (Hailikari et al., 2007), especially in accounting (see Sections 3.2.4 & 4.2.1). Research has shown that prior knowledge, as measured by the HSGPA and/or CEEs is significantly correlated with success in university accounting programs (e.g., Al-Twaijry, 2010; Farley & Ramsay, 1988; Farley & Yang, 2020; Kobrin et al., 2008). These studies, however, do not explicitly distinguish between declarative and procedural knowledge. Therefore, this research will extend the accounting education literature by distinguishing prior knowledge into declarative and procedural types, examining their respective impacts on accounting performance and clarifying the role of various admission criteria in predicting academic performance in accounting programs (see Section 4.2).

This research also draws on cognitive load theory (CLT) to examines how the demands of processing information affect a learner's ability to acquire new knowledge and skills. CLT is 'concerned with the learning of complex cognitive tasks, in which learners are often overwhelmed by the number of interactive information elements that need to be processed simultaneously before meaningful learning can commence' (Paas et al., 2010, p. 116). CLT is based on a cognitive architecture that consists of limited working memory, interacting with comparatively unlimited long-term memory, and partly independent processing units for visual/spatial and auditory/verbal information (Paas et al., 2016). In the context of non-native English speakers (such as Saudi students) pursuing advanced accounting studies, CLT explains how language proficiency imposes cognitive load to learners and hence affect their academic performance (see Section 4.3). Prior literature reports that EFL students often have difficulty with accounting due to language barriers, which results in misunderstanding in a variety of situations (Cohen & Hanno, 1993; Goh & Scerri, 2016; Mladenovic, 2000; Umar & Olowo, 2023). Accounting is comprised of both MC and LC courses, each with distinct cognitive demands. The cognitive load of LC courses is relatively lower compared to MC courses because they have lower level of element interactivity. MC courses, however, which require substantial reading, argumentation and case analysis, requires greater element interactivity, leading to placing greater cognitive load for EFL students (Yang & Farley, 2019). This research builds on and extends Yang and Farley's (2019) study to examine the impact of English language

proficiency, measured by IELTS, on the relative academic performance in MC versus LC accounting courses in the Saudi context (see Section 4.3).

To address the research questions, the study will test the following hypotheses:

> **H1**: Each entrance criterion (HSGPA, GAT & AT) is a predictor of academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program.
>
> **H2**: Each entrance criterion predicts academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program above what is predicted by the other two entrance criteria.
>
> **H3**: Each PYP business college variable (QUN 001, QUN 002, SKL 001 & PYPGPA) is a predictor of academic performance in first-year core courses, FYGPA and overall GPA in the accounting program.
>
> **H4**: Each PYP business college variable predicts academic performance in first-year core courses, FYGPA and overall GPA in the accounting program above what is predicted by the other three PYP business college variables.
>
> **H5**: Gender moderates the relationship between HSGPA, GAT and AT and each of the PYP and first-year core courses, FYGPA and the overall GPA in the accounting program.
>
> **H6**: Students with a higher level of English language proficiency as measured by IELTS score as the admission criterion perform relatively greater in MC courses than LC courses.

Each hypothesis listed above addresses the research questions by examining different admission criteria on predicting the academic performance in the accounting programs. Thus, these hypotheses provide a structured approach to understanding the various factors that contribute to academic performance (see Section 4.4).

Table 7.1 summarizes the findings on testing these hypotheses.

1.4 Research Methodology

This research draws on data from QU and KSU, two public universities in Saudi Arabia offering accounting programs. The central objective is to analyse the appropriateness of current Saudi Arabian university admission criteria for undergraduate and postgraduate accounting programs. Data were collected from QU for undergraduate students and from KSU for graduate students due to data availability in these two universities.

The data collected from QU is to examine the admission criteria for the undergraduate accounting program. Data collected include HSGPA, GAT and AT scores, PYP, and gender. The PYP includes courses in mathematics, statistics and academic skills, Additionally, data for nine first-year core courses and overall GPA were collected for analysis (see Section 5.8.1.3). The sample included all students from four consecutive cohorts in the accounting program who enrolled during the 2015–16 and 2016–17 academic years, totalling 608 students. Comprehensive data from all enrolment semesters during these years were collected (see Section 5.8.1). Univariate and multivariate regression analyses were used to investigate the first seven research questions (see Section 5.8.1.5).

The focus of the KSU analysis is the admission criteria for the graduate accounting program. The Master of Accounting program requires a minimum IELTS score of 5.5 as evidence of English language ability for acceptance. The accessible data included IELTS scores for 44 Saudi students who submitted this information as part of their enrolment process and successfully completed all four accounting specialisation courses between 2016 and 2021 (five school years). This research aims to quantify the impact of IELTS scores on relative performance in MC- versus LC-oriented accounting courses in the context of EMI in the accounting discipline. Therefore, final marks from four accounting courses were collected as dependent variables (see Section 5.8.2.1). Two separate analyses were conducted to determine if a two-way interaction effect exists between language comprehension levels (5.5, 6.0 & 6.6) and MC/LC (the two independent variables) in explaining the mean results of the students. Consequently, an ANOVA test was applied (see Section 5.8.2.4 for more information on the statistical approach).

The research methodology is described in Chapter 5 (also see Figure 4.4).

1.5 Significance of the Research

This thesis is justified on several significance grounds, addressing critical gaps in the existing literature and offering valuable insights for stakeholders within the Saudi Arabian educational context.

Theoretically, this research makes a significant contribution by adopting and integrating Prior Knowledge Theory (PKT) and Cognitive Load Theory (CLT) to explore the mechanisms through which admission criteria influence the academic outcomes. This approach not only clarifies the applicability of these theories in educational settings, but also emphasises their relevance to the improvement of the admissions process and predicting academic performance. By doing so, the study enriches theoretical development and underscores the importance of a comprehensive theoretical foundation in educational prediction research (see Section 7.6.1).

Empirically, this research advances the analysing of tertiary admission criteria - specifically HSGPA, GAT, and AT - and their relevance to academic performance in the accounting programs. Prior research based in Saudi Arabia context has largely been descriptive (see Table 3.4), leaving an important gap in understanding how admission measures relate to academic performance. By adopting a longitudinal approach and extensive data collection, this research contributes robust evidence on the predictive validity of these criteria. It examines various academic performance indicators, including PYP courses, PYPGPA, first-year core courses, FYGPA, and overall GPA. Additionally, it incorporates gender as a moderating factor. This nuanced analysis responds to the call for more discipline-specific studies in Saudi Arabia, recognizing the unique challenges and characteristics inherent to accounting education (Abdelfattah et al., 2022; Alghamdi & Al-Hattami 2014; Alnahdi, 2015; Alshammari, 2020). Moreover, to the author's best knowledge, few studies have investigated the impact of PYP on academic performance of accounting students (see Section 3.5.4). In other words, it was not known to what extent the PYP contributes to students' performance and facilitates the transition from high school to university. The current study focusses on an accounting program that is part of a business college and contributes to address this gap by providing new evidence reflecting the effectiveness of PYP courses and PYPGPA in predicting accounting students' performance measured by first-year courses, FYGPA and overall GPA, with gender acting as a moderator. Further, the review of literature (see Tables 3.3 & 3.4)

identified a gap in knowledge of the impact of English language proficiency, as measured by IELTS or its equivalent, on relative academic performance in MC and LC accounting courses. Hence, responding to the call from the researcher (Alqarni et al., 2024; El-Moussa et al., 2021; Yang & Farley, 2019), this research sought to add to the accounting education literature by investigate the impact of IELTS on relative academic performance in the accounting program (see Section 7.6.1).

Practically, the findings of this research have numerous implications for stakeholders and policymakers in terms of improving admission requirements and policies to improve the accuracy of predicting the performance of the accounting students. Firstly, for high schools, it offers the Ministry of Education in Saudi Arabia valuable insights into how effectively high schools prepare students for higher education. Additionally, the study provides the National Center for Assessment in Higher Education (NCAHE) with an understanding of how the GAT and AT contribute to predicting academic performance. By identifying the best admission criteria predictors of performance in accounting programs, universities can refine their selection processes to better identify candidates likely to excel academically. More so, the study addresses the 'preparation gap' by evaluating the impact of PYP on university performance, specifically within the accounting program. This research provides the admission policy for QU in regard to how the PYP contributes in predicting academic performance. Furthermore, this research uniquely examines the interaction effects of gender on the relationship between admission criteria and academic performance. By incorporating gender as a moderator, the study provides a more nuanced understanding of how different admission criteria affect male and female students differently, thereby informing more equitable and effective educational policies. Lastly, the investigation into English proficiency, measured by IELTS scores, and its impact on relative performance of the accounting students sheds new light for enhancing language support services and the effectiveness of minimum requirements set by policymakers for the master EMI accounting program based in Saudi Arabia (see Section 7.6.2).

1.6 Thesis Structure

This thesis consists of seven chapters including this introductory chapter (Chapter 1). Chapter 2 highlights the Saudi Arabian education context, presenting a brief overview of Saudi Arabia's educational system, in particular secondary schools and higher education.

Further, the chapter provides an overview of the admission criteria, PYP and higher accounting education at Saudi Arabian universities, and concludes by discussing the Saudi Organisation for Certified Public Accountants (SOCPA) and its rules in the Saudi Arabian accounting context.

Chapter 3 reviews relevant literature. The objective of the chapter is to provide a comprehensive review of admission methods for undergraduate and postgraduate studies. A review of admission criteria is conducted in the first part of the chapter, which focuses on the HSGPA, CEEs and gender considerations. The second part of the chapter explores how the PYP affects the admissions process. Third, the chapter delves into the impact of English language proficiency as measured by the IELTS on relative academic performance. Last, the chapter discusses Saudi Arabian studies to define the literature gap. In addition, Chapter 4 discusses how prior knowledge theory and cognitive load theory are in the research. This chapter also presents the hypotheses to be tested.

Chapter 5 explains the research methodology. It begins with a discussion of the chosen research paradigm, design and strategy, which serves as the basis for the study. This follows by a detailed description of the variables used in this research, and the statistical methods employed to test the research hypotheses.

Chapter 6 presents descriptive statistics, demonstrating the effectiveness of the admission criteria in predicting academic performance for the Bachelor of Accounting students. Additionally, it reports the results from the analysis of the effect of English language proficiency, as measured by the IELTS, on the relative performance of accounting students. Last, the chapter provides a summary of the study results.

Chapter 7 presents conclusions, discussions, contributions, implications and limitations of the study and suggests directions for further research.

1.7 Definitions of Terms

Course: In Saudi Arabia, the term ‘course’ refers to what in other research is often referred to as an individual subject or unit in a program. In Saudi Arabia, the program structure covers multiple years, and within a program, students complete a number of courses each year. This thesis uses the term ‘course’.

College Entrance Exam (CEE): This is a standardised test designed to assess the academic readiness and potential of students applying to colleges and universities.

More/less conceptual (MC/LC): This research adopts the classification of accounting courses described by Yang and Farley (2019, p. 14):

> The distinction between MC and LC, is that MC oriented subjects involve intensive reading, writing, case studies, presentation of arguments, and professional judgements (e.g., accounting theory and auditing). In contrast, LC oriented subjects tend to involve more formulas and calculations, with less reading, writing and presentation of arguments required (e.g., corporate finance and corporate accounting).

English Medium Instruction (EMI): The use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language of the majority of the population is not English. (Macaro et al., 2018, p. 37).

Saudi Arabia's Vision 2030: The Saudi Arabian government unveiled its Vision 2030 initiative on 25 April 2016. It aims to reduce the country's dependence on oil, promote economic diversification and develop sectors such as education, health, infrastructure construction, recreation, tourism and more in accordance with the accompanying policy document (Saudi Arabia's Vision 2030, 2016, pp. 43–44).

1.8 Summary

This chapter presented the background and motivation for this research. In addition, it outlined the study objectives and questions. It presented a summary of the theoretical framework and research methodology, significance of the research, a detailed structure of the overall research and definitions of important terms.

Chapter 2 will explain the background of Saudi Arabia's educational system, with a focus on accounting education.

Chapter 2: The Context of the Research

2.1 Introduction

The objective of this research is to analyse the ability of current admission criteria for accounting programs in Saudi Arabian universities to predict student performance. It is important to first explain the history and environmental context of Saudi Arabian accounting and education.

This chapter highlights the Saudi Arabian context as follows. in Section 2.2, a brief history of education is provided. Sections 2.3 and 2.4 present how Saudi Arabian education in general and high school in particular are structured. The Education and Training Evaluation Commission (ETEC) is discussed in Section 2.5, along with a review of CEEs, which include the GAT and AT. Section 2.6 discusses higher education, specifically accounting education. Sections 2.7 and 2.8 provide an overview of SOCPA and its rules in the Saudi Arabian accounting context, as well as an overview of the AACSB and Saudi Arabian accounting programs. Towards the end of the chapter, a summary is provided of the main aspects discussed throughout the chapter.

2.2 Brief History of Saudi Arabian Education

The General Directorate of Knowledge was formed by King Abdul Aziz in 1924. This directorate served as the foundation for the current Ministry of Education, with the primary goal of directing and supervising education at all levels. In addition, with King Abdul Aziz's approval in 1927, 14 students from different fields of study were sent to Egypt to obtain a higher education. In 1953, the Ministry of Education was created. The first minister of education was King Fahad Bin Abdul Aziz (Al-Nafea, 2005). Until the mid-1950s, education was provided exclusively to men in the Islamic tradition and females' education was completely disregarded (Al-Rehaily, 1992). During that time, Saudi Arabian society was recovering from the effects of the dominant customs and traditions in its culture (Mehana, 2009; Mirza, 2008).

In 1960, the General Presidency of Females' Education was founded to govern and monitor the education of females at all levels with the support of King Faisal Al-Saud and his wife Princess Effat. Since then, attitudes toward women's' education have changed

(Metz, 1992). There was strong opposition in some geographic regions, where nonreligious education was viewed as unnecessary, or even dangerous, for females (Metz, 1992). However, within a few years, there was a definite change in public opinion regarding the importance of females' education, and the population generally became more supportive of it (Metz, 1992). In 1989, the number of females enrolled in the public school system was almost equal to that of the number of boys (Metz, 1992).

2.2.1 Historical Developments in the Saudi Ministry of Education

The Saudi Arabian education system is overseen by three departments: the Ministry of Education; the Ministry of Higher Education; and the General Establishment of Technical Education Training (Al-Nafea, 2005). All these departments operate their institutions in accordance with the Saudi government's educational policy framework, known as the 'documentary policy of education in Saudi Arabia', which was formed in 1970 (Roy, 1992).

In 1926, it was established as the Directorate of Knowledge and was tasked with overseeing education at all levels for both males and females. It was originally known as the directorate of knowledge. In 1952, the directorate of knowledge was renamed to the Ministry of Knowledge, followed by revisions in 2002 and 2015 to the Ministry of Education. The General Presidency for Females' Education, Technical and Vocational Training Corporation was converted to the Ministry of Education following establishment of the Ministry of Higher Education but was only responsible for general education (primary, intermediate & secondary; Alshammari, 2020). Female public education has been supervised by the General Presidency for Females' Education since 1960. In 2002, this agency was incorporated into the Ministry of Knowledge (later, the Ministry of Education; Alaqeel, 2013).

The renaissance in education in Saudi Arabia has been greatly influenced by the oil economy. As a result of oil revenue, education and culture in the country have developed, particularly after the government established a wide range of educational programs and plans (Srdar, 2017). From 1964 to 1975, the government spent around 10% of its budget on education, according to Metz (1992). Aramco (the Saudi Arabian public petroleum & natural gas company) also works on developing the country's cultural and educational life, starting with the opening of schools in the eastern region that were like schools in

the USA (Shalabi, 1990). Moreover, the company provides private schools for the children of its employees and sponsors students to study in the USA in areas relevant to their businesses. This marked the beginning of an era of friction and the influence of Western civilization on Saudi society (Shalabi, 1990).

Saudi Arabia's higher education system has been centralised since its establishment, meaning that the Ministry of Higher Education carries out planning and management while universities rely primarily on government funding and infrastructure (Al-Eisa & Smith, 2013). Therefore, the Saudi government has developed a number of regulations for all aspects of higher education, including the number of students to be enrolled, student admission procedures and faculty member personnel policies (e.g., salaries, promotions & retirement age; Alkhazim, 2003). The Saudi government's funding includes providing free higher education to students. Further, as stated in item 41 of the financial regulations for universities, students pursuing undergraduate studies at public universities receive a monthly payment of 850 SR (~US$226) per month for those in arts discipline colleges and 1,000 SR (~US$266) for students enrolled in science colleges (KSU, 2019). It is also the government's responsibility to provide the necessary equipment, buildings, textbooks and teaching aids, in addition to hiring and training teachers, and securing their salaries. Likewise, the government is responsible for pensions (Alshammari, 2020). In January 2015, the Saudi government merged the ministries of higher education and public education into one ministry—the Educational Ministry—and assigned a minister to each sector (Alshammari, 2020).

Studies indicate that as demand for higher education increases, a government may allow a greater contribution from the private sector (Altbach et al., 2010). Prince Sultan University was the first private university established in Saudi Arabia, in 1999. However, private universities are highly regulated by the government under the supervision of the Educational Ministry, which provides a set of policy guidelines relating to the establishment, operation and licensing of private higher education institutions. Therefore, the government has presented the main reason for increasing its level of control in the private education sector. The stated reason is that this will ensure quality outcomes and diverse programs that meet the needs of the job market and contribute to the country's goal of scientific and technological advancement (Al-Eisa & Smith, 2013).

2.3 The Structure of Education in Saudi Arabia

2.3.1 General Education

General education in the system spans four distinct stages. It begins with a one-year preschool phase, followed by six years at primary school and three years at intermediate school, and culminates with three years of secondary school education. Children are typically enrolled in preschool at the age of five years, attending for one year before advancing to primary school at age six. They remain in primary school until the age of 12 years, acquiring foundational skills in reading, writing and mathematics. Following primary school, students enter an intermediate stage lasting three years, during which they enhance their critical thinking abilities and learn to apply their knowledge effectively (Al-Nafea, 2005).

The secondary school stage also consists of a three-year program. Administrative science, Islamic science, and natural science are the options available to students. Students who complete the program are issued a General School Secondary Certificate, which allows them to enrol in a higher education institution (Al-Nafea, 2005).

2.3.2 Degrees in Higher Education

In Saudi Arabia, higher education refers to all levels of formal education that follow completion of one of various secondary school courses. Al-Nafea (2005) indicated that in higher education, the most common first degrees completed via universities are a Bachelor of Arts (BA) (e.g., linguistics, history or humanities) and Bachelor of Science and Social Science (BSc) (e.g., engineering, computer science and business). In terms of postgraduate degrees, there are two options for masters' programs: a Master of Arts (MA) or Master of Science (MSc). The MA is a professional pathway with coursework, which is particularly prevalent in business colleges; and the MSc is an academic trajectory requiring a thesis. A higher degree by research, a Doctor of Philosophy (PhD), is also available.

Undergraduate degrees are four to five years in duration depending on the discipline. Achievement of a degree through a business college ordinarily occurs within four years. This does not include preparatory programs, since these vary between colleges from one

semester through to a year in length (see Section 2.6.1 for more details about differences in the PYP).

The earliest universities established in Saudi Arabia reflect the country's gradual expansion of higher education institutions. King Saud University (KSU) in Riyadh was the first, established in 1957, followed by the Islamic University in Medina in 1961. In 1963, King Fahad University of Petroleum and Minerals was opened in Dhahran. King Abdulaziz University (KAU) in Jeddah began as a private institution in 1967 and was nationalised in 1971. Imam Mohammed Bin Saud Islamic University in Riyadh was founded in 1974, followed by King Faisal University in Hofuf in 1975. Finally, Umm Al-Qura University was established in Makkah in 1981 (Al-Nafea, 2005).

2.3.2.1 University Academic Year in Saudi Arabia

The university year spans roughly September to early June, with the Muslim feasts of Eid al Fiter and Hajj interrupting the schedule. The Saudi university academic year is divided into two semesters: September–January as the first semester and February–June as the second semester, with approximately 15 weeks for each (Al-Nafea, 2005).

An understanding Saudi-specific admission criteria such as the HSGPA and CEEs (GAT & AT) is crucial for this study, since it aims to determine what kinds of prior knowledge are represented by these criteria–as discussed in Sections 2.4 and 2.5–and compatible with the PKP (see Section 4.2).

2.4 Public Education System

A brief summary of the public-school education system is provided for the aim of this research. The public education system in Saudi Arabia is highly centralised. The Ministry of Education runs and supervises the public education system for both males and females. It establishes standards, develops curricula and creates textbooks for all of the country's schools. All public schools must implement the same curriculum and use the same textbooks, standards and materials (Alshumrani, 2007).

The academic year at public schools consists of approximately 15 weeks in each of two semesters. The number of classes per week varies from 28 to 35, depending on the grade and the major of school, and lessons are 45 minutes long (Alshamrani, 2007). Public

schools for boys and females are completely segregated, with only male staff at schools for boys and only females at schools for females (Almunajjed, 1997; Barry, 2019; Hamdan, 2005).

2.4.1 High School System in Saudi Arabia

For the aim of this research, which analyses how well the main admission criteria predict academic performance in university accounting courses, it is essential to provide an overview of the high school system, curricula and GPA calculation.

High school education in Saudi Arabia spans three years following intermediate school. This phase, like other educational stages, serves Saudi Arabia's general objectives. It emphasises loyalty to Allah and the Islamic homeland, especially Saudi Arabia. The curriculum aims to enhance student aptitude, foster scientific thinking and promote critical awareness of diverse ideas (Alhogail, 2011). Since its inception in the country, high school education has undergone numerous legislative and curricular reforms, leading to a broader array of specialised secondary schools including commercial, agricultural and technical institutions (Alghamdi & Abduljawad, 2005).

2.4.1.1 Types of High School

High schools in Saudi Arabia can be classified into three types: Holy Qur'an memorisation schools, scientific institutes and general high schools.

2.4.1.1.1 Holy Qur'an Memorisation

High schools accountable to the Ministry of Education first opened in Makkah between 1967 and 1977. These schools offer a three-year program emphasising Qur'an studies, Islamic sciences and Arabic, which occupy 78% of class time. Students also learn history, geography, English and physical education (Higher Committee for Education Policy, 1982).

2.4.1.1.2 Scientific Institute

In 1951, the first scientific secondary institute was opened, supervised by Imam Mohammed Bin Saud Islamic University, with a curriculum emphasising legal (Sharia)

and Arabic language sciences for 80% of class time and allocating 20% to social studies and English (Imam Muhammad Bin Saud Islamic University, 1991).

2.4.1.1.3 General High School

In Saudi Arabia, the general education system primarily teaches subjects such as Arabic, religion, mathematics and sciences, for the vast majority of high school students who aim to pursue a university education. These curricula build on the foundation established during the intermediate stage.

In the first year of secondary school, students study all subjects together, including both human (art) and natural sciences. By the second and third years, they can choose between the human and science tracks. The natural sciences track focuses on physics, chemistry, biology, geology, mathematics, statistics and Arabic & English language (see Table 2.1) while the human sciences track in high school includes subjects such as Qur'an, Islamic studies, literature, history, geography, psychology, sociology, library and research skills, and Arabic & English language (see Table 2.2).

Upon graduation, students receive a high school diploma, which qualifies them for higher education in either public or private colleges or universities (Alshammari, 2020; Alsunbol et al., 2008).

2.4.1.2 High School Assessment System in Saudi Arabia

Under the high school evaluation system in Saudi Arabia, each course carries a total of 100 marks per semester. Student performance is assessed through both ongoing activities and final examinations. Of the 100 marks, 50 are allocated to semester activities, which include 30 marks for attendance, participation, homework, and research or reports, and 20 marks for two teacher-prepared exams. In the case of Qur'an memorisation, which is evaluated orally, a full 100 marks are awarded, with an additional 5 marks assigned for regular attendance. The remaining 50 marks are reserved for the semester-end exam. To successfully pass a course, students must achieve at least 50 percent overall, with a minimum of 20 percent in the final exam. Final exams are conducted in multiple sessions: the first session serves as the standard end-of-level exam for all students, the second session is for subjects not passed in the first, and an additional opportunity is provided for any failed subjects, giving students two more chances to pass. The HSGPA is

calculated based on the total marks accumulated over the 10th, 11th, and 12th years. These marks, amounting to 4,000 across 40 subjects, are divided to yield a cumulative score out of 100. For further detail on the subjects included and the method for calculating the HSGPA, refer to Tables 2.1 and 2.2. Collectively, these percentages contribute to the General Secondary School Certificate average.

Table 2.1: Natural sciences path

No.	Courses	Mark total	Study Levels	Year
1	Biology 1	100		
2	Health Education	100		
3	Tawheed Monotheism 1	100		
4	Mathematics 1	100	Level 1	
5	Physics 1	100		
6	English Language 1	100		
7	Arabic Language 1	100		10
8	Social Studies	100		
9	Interpretation of the Quran 1	100		
10	Computer Science 1	100		
11	Mathematics 2	100	Level 2	
12	Chemistry 1	100		
13	English Language 2	100		
14	Arabic Language 2	100		
15	Computer Science 2	100		
16	Hadith (Prophet's Traditions) 1	100		
17	Mathematics 3	100		
18	Physics 2	100	Level 3	
19	Chemistry 2	100		
20	English Language 3	100		
21	Arabic Language 3	100		11
22	Biology 2	100		
23	Life Skills and Family Education	100		
24	Mathematics 4	100		
25	Figh (Jurisprudence) 1	100	Level 4	
26	The Holy Quran 1	100		
27	English Language 4	100		
28	Arabic Language 4	100		
29	Biology 3	100		
30	Mathematics 5	100		
31	Physics 3	100	Level 5	
32	Chemistry 3	100		
33	English Language 5	100		
34	Art Education	100		12
35	Ecology	100		
36	Physics 4	100		
37	The Holy Quran 2	100	Level 6	
38	Chemistry 4	100		
39	Vocational Education	100		
40	Mathematics 6	100		
	Total of marks of (10th, 11th & 12th year/number of courses	4000/40	100%	

Table 2.2: Human sciences path

No.	Courses	Mark total	Study Levels	Year
1	Social Studies	100	Level 1	10
2	Computer Science 1	100		
3	Mathematic 1	100		
4	Physics 1	100		
5	The Holy Quran 1	100		
6	English Language 1	100		
7	Arabic Language 1	100		
8	Biology 1	100	Level 2	
9	Health and Family Education	100		
10	Tawheed Monotheism 1	100		
11	Mathematic 2	100		
12	Chemistry 1	100		
13	English Language 2	100		
14	Arabic Language 2	100		
15	Interpretation of the Quran 1	100	Level 3	11
16	Geography	100		
17	Figh (Jurisprudence) 1	100		
18	Administrative Skills	100		
19	English Language 3	100		
20	Arabic Language 3	100		
21	Ecology	100	Level 4	
22	History	100		
23	Tawheed Monotheism 2	100		
24	Computer Science 2	100		
25	Hadith (Prophet's Traditions) 1	100		
26	English Language 4	100		
27	Arabic Language 4	100		
28	Administrative Sciences 1	100	Level 5	12
29	Hadith (Prophet's Traditions) 2	100		
30	Life skills and Family Education	100		
31	Figh (Jurisprudence) 2	100		
32	English Language 5	100		
33	Arabic Language 5	100		
34	Research & Information Sources	100		
35	Administrative Sciences 2	100	Level 6	
36	Interpretation of the Quran 2	100		
37	Vocational Education	100		
38	Art Education	100		
39	Psycological and social Studies	100		
40	Arabic Language 6	100		
HSGPA	Total of marks of (10th, 11th & 12th year/number of courses	4000/40	100%	

Table 2.3: High school grading scale

90–100	Excellent
75–89	Very good
60–74	Good
50–59	Pass
0–49	Fail

2.5 The Vision and Mission of the Education and Training Evaluation Commission

The ETEC was established in 2017 through the Council of Ministers *Resolution No. (94)* as an autonomous entity, both financially and administratively, directly reporting to the prime minister. Its reorganisation in 2019, via *Resolution No. (108)*, aimed to amplify its role in evaluating, measuring and accrediting educational and training qualifications across both public and private sectors. The objectives of the ETEC are to (i) elevate student academic results and proficiency; (ii) advance the proficiency and calibre of educators and training professionals; (iii) champion high standards in education and training institutions and curricula; (iv) cultivate an enduring ethos of enhancement in education and training, utilising data-driven insights for strategic national growth and informed choices; and (v) bolster the commission's core competencies (ETEC, 2024; https://acpd.etec.gov.sa/home/QAEn).

The ETEC's primary vision is to be a high-impact quality model in education and training in Saudi Arabia as well as a global leader, contributing to national development and economic growth (ETEC, 2024). Its mission is to enhance the quality and efficiency of education, align it with labour market needs and support Saudi Arabia's Vision 2030 and its Human Capacity Development Program (ETEC, 2024).

2.5.1 The National Center for Assessment in Higher Education

In Saudi Arabia, university admissions used to predominantly rely on high school examination scores, with few variations, such as personal interviews. However, this paradigm shifted with the inception of the National Center for Assessment in Higher Education (NCAHE) in 2002, which is now under the ETEC umbrella following Council

of Ministers *Resolution No. (94)*. The NCAHE introduced the standardised GAT and AT that became mandatory for all tertiary education institutions in the country. Its foundation aimed to centralise and scientifically develop these admissions tests, leveraging the expertise of university professionals. The centre established four specific objectives:

- Admission to higher education institutions in Saudi Arabia now hinges on a two-pronged assessment system: the high school exams and tests developed by the NCSAE. These tests encompass:
  a) Evaluation of student abilities and inclinations.
  b) Academic achievement assessments standardised across related fields of study, whether scientific or theoretical.
- While students can opt to take these tests multiple times a year, everyone is limited to three attempts.
- To sustain its operations, cover developmental costs and fund pertinent research, the centre charges a fee for its tests, currently set at 100 SR (~US$26.67).

2.5.2 Standardised Test Based on the Saudi Arabian Context

A standardised test is an exam of high stakes designed to measure individual abilities and skills. The term 'standardised' refers to the fact that the administration, format, content, language and scoring procedures are the same for all participants. Therefore, a process of standardisation applies to all aspects of testing, including the construction, administration, scoring, reporting and interpretation of results. The requirements to be admitted to university in Saudi Arabia are now based on the results of the GAT and AT developed by the NCAHE, which is an independent national centre supplying the colleges and post-secondary institutions with standard exams that can be used for entry (Alshumrani, 2007, p. 2).

In accordance with this research's objective of examining the ability of existing admission criteria to predict academic performance in accounting, a brief overview of the GAT and AT is now provided.

2.5.2.1 General Aptitude Test

In light of the increasing number of applications for admission; the uncertainty regarding the reliability of high school exams (Aldurayheem, 2020); and claims of inflation of the

HSGPA (Mahmoud & Alaraj, 2018), the government requested that the National Centre for Assessment (NCA) in Riyadh provide comprehensive and scientific solutions for assessing and measuring knowledge, skills and aptitude. This was aimed at ensuring fairness, upholding quality and meeting developmental needs (Alshumrani, 2007). Accordingly, the GAT was developed in 2004. The NCA recognised that there was both a need for and a lack of a high-quality measurement tool that would properly assess the aptitude and skills of Saudi high school students.

The GAT measures analytical and deductive skills, focusing on testing the general ability for learning, regardless of any specific skill in a particular topic. In other words, the GAT is designed to measure deductive, logical and critical thinking skills, rather than aligning directly with the curriculum. The test is provided in Arabic, contains 150 multiple-choice items and is administered twice a year (ETEC, 2024). It has verbal and quantitative sections. The verbal segment includes reading comprehension, sentence completion, analogies, contextual errors, and relationship and difference sub-sections. The quantitative segment for science-focused students includes arithmetic, geometry, algebra, statistics, comparison questions and other basic mathematic functions. For those wishing to major in human science, the quantitative segment contains geometry, arithmetic and mathematical analysis problems. All questions are presented in a multiple-choice format and scoring is done automatically using machines (ETEC, 2024).

2.5.2.1.1 The Verbal Section

Reading comprehension in the test assesses the understanding and analysis of passages through questions. Next, the sentence completion section requires test takers to fill in text gaps to form complete sentences. Following that, the verbal analogy section involves matching relationships between pairs of words. Additionally, the synonym portion asks examinees to find a word synonymous with a given word. The test includes 68 questions for those majoring in natural science and 91 for human majors.

2.5.2.1.2 The Quantitative Section

This section presents mathematical problems tailored for general secondary schools' natural science and human science, emphasising measurement, inference and problem solving with basic knowledge. The 52 natural science-major questions assess mental ability and reasoning, distributed as follows: 40% arithmetic; 24% geometry; 23%

algebra; and 13% statistics and analysis. Human sciences are assessed with 30 questions each in arithmetic, geometry and mathematical analysis.

A review of the National Policies of Education in Saudi Arabia (2020) stated that despite assertions that the GAT tests deductive, logical and critical thinking skills, the reviewing panel observed that most questions could be answered through memorisation. The reading section evaluates more basic skills, suggesting that most responses can be sourced directly from the text itself, rather than requiring any significant inference. Moreover, the quantitative section of the GAT examines arithmetic, algebra, geometry and interpretation of graphs and tables. This level of assessment is, however, somewhat less challenging than most international examinations (National Policies of Education in Saudi Arabia, 2020). See Appendix A for a sample of GAT test questions in each section.

2.5.2.2 Achievement Test

The AT measures student achievement in various subjects during their secondary education in both the scientific and human disciplines and is conducted in Arabic. Unlike the GAT, the AT is more challenging and focused on specific subject domains.

For natural science majors, the AT covers areas such as mathematics, biology, physics and chemistry. Questions assess different cognitive levels, including comprehension, application and inference. Specifically, the structure of the AT for scientific disciplines emphasises general concepts in biology, chemistry, physics and mathematics, and covers subjects taught across all three secondary grades. These questions are distributed across the three high school grades in the proportions of 20% for the first grade, 30% for the second grade and 50% for the third grade, with an even division among the subjects mentioned.

The AT for arts disciplines targets public high school graduates including those from the human science and Quran memorisation disciplines, as well as individuals aiming for test-based colleges. The focus here is on general concepts in disciplines such as modern Islamic culture, monotheism, jurisprudence, grammar, rhetoric and criticism, literature, history and geography. Similarly, these questions also cover the three secondary grades and vary in cognitive emphasis, requiring understanding, application or analysis. The distribution across high school grades is the same as in the scientific disciplines.

By addressing questions based on the content of high school curricula, the AT examines student skills as they relate to knowledge acquired in high school. According to Alnatheer (2009, as cited in Khoshaim, 2017), the establishment of the NCAHE assisted in addressing some criticisms of the educational system in the country. However, the Review of National Policies of Education in Saudi Arabia (2020) indicated that:

> The sample AT was expectedly more difficult than the GAT contained questions that were more appropriate for Grade 12 students (the test covers content from Grades 10, 11 and 12). However, answering the questions for the most part relied on memorization of facts rather than critical thinking skills (p. 168).

The AT is a three-hour examination designed to determine a student's mastery of high school fundamentals essential for college success. The test is divided into two categories: natural sciences (including biology, chemistry, physics, mathematics & English as a Second Language [ESL]) and human sciences (including courses in Arabic language, legal sciences, history & geography). Every question on the AT is presented in a multiple-choice format. The test is divided into six sections: two sections for general aptitude questions and four sections for educational achievement questions (ETEC, 2024). See Appendix B for a sample of AT test questions in each section.

2.6 Higher Education in Saudi Arabia

Enrolment at university is determined by three key criteria: (i) the demand for higher education; (ii) the need for qualified manpower; and (iii) the capacity of universities (Al-Nafea, 2005). As this research concentrates on accounting programs based in Saudi Arabia, the subsequent sections provide an in-depth overview of the PYP and accounting education in this specific context.

2.6.1 Preparatory Year Program

Despite requiring admission tests (GAT & AT) alongside the HSGPA for secondary school graduates to enable them to enrol in higher education, the Ministry of Education in Saudi Arabia discovered that this was not sufficient to address the challenges faced by students, especially during their first year (Khoshaim, 2017). Consequently, to better support students during their first year in higher education, the ministry implemented decisive changes. Understanding the significance of ensuring student readiness and of

fostering independent learning habits for a smoother academic transition (Bergsten et al., 2016), both public and private higher education institutions in the country were mandated to incorporate the PYP.

Depending on the institution at which a student enrols, the PYP can span an entire academic year or just one semester. The program is dedicated to provide foundational education in areas such as mathematics, English language proficiency, computer literacy and personal growth skills (Khoshaim, 2017). Importantly, once a student moves on to a specialised program, their GPA from the PYP is not factored into their overall academic records.

Essentially, the PYP aims to bridge the gap between secondary education and university requirements by transitioning students from structured, guided teaching methods to a more independent, knowledge-seeking approach (Alatas, 2012; Alhosin, 2010; Alnassar & Dow, 2013; Bagazi, 2010; Habib, 2010). Moreover, through the PYP, there is a concerted effort to curb dropout rates and boost both student success and graduation rates in Saudi Arabian universities by ensuring students are adequately primed for university-level studies. Alanazi (2014) highlighted challenges faced by institutions such as Imam Muhammad Ibn Saud University, which saw only around half of its student population graduate between 2000 and 2010. This statistic underscores the difficulties students encounter when moving from the structured environment of public schools to the more independent setting of higher education, underlining the importance of the PYP.

In general terms, Saudi Arabia's PYP is designed to equip students with vital skills in English, mathematics and the sciences, boosting their success in undergraduate programs. However, the PYP's structure and duration varies among academic programs, and each university tailors its program, duration and curriculum. Given this diversity, this study narrows its focus to QU, particularly aiming to delve into the PYP offered there.

QU offers a PYP with two distinct paths. The first is tailored to science disciplines, including engineering, computer science and physics, while the second path is oriented towards health disciplines. Spanning one academic year (two semesters), the program is structured as follows: during the first semester, all students undergo joint courses, which encompass (i) preparatory English (1), (ii) statistics, (iii) physics, (iv) computer science and (v) thinking skills and learning styles. Transitioning to the second semester, students

continue with a single joint course: preparatory English (2). Additionally, they are required to take two discipline-specific courses, correlating with the major they intend to pursue (PYP at QU; https://cbe.qu.edu.sa/content/pages/1458).

Thus, only upon successfully completing all courses in the PYP can students enrol in specialised academic programs. Moreover, students must achieve a specific overall GPA in the PYP to qualify for certain disciplines. This GPA requirement is determined based on the cohort's level, which the university establishes at the end of the PYP (PYP at QU website). For instance, in the health path, if a student aspires to enrol in medical school, they must rank in the top 10% of their cohort. However, this percentage can vary depending on the cohort's level and the available seats in the college.

The CBE at QU offers a distinct PYP. Since 2010, the CBE has mandated students to complete the PYP in conjunction with their HSGPA, GAT and AT as prerequisites for entering degree programs. The PYP at the CBE is comprised of three courses: mathematics, statistics and academic skills, spanning a duration of one semester. First, the mathematics course (QUN 001):

> provides a set of basic concepts in the field of mathematics for preparatory year students, which are essential for further studies in the College of Economics and Administration. The course topics include real numbers and operations on them, bases and roots, polynomial analysis, solving first and second-degree equations, and inequalities of the first and second degree.

The statistics course (QUN 002):

> provides the basic concepts in statistics and outlines the stages of statistical research. It also deals with statistical data (its types, classifications, and collection). The course explains types of random samples and emphasizes the preparation of frequency tables in all its types (simple, double, cumulative, and relative). It also focuses on statistical measures (central tendency, dispersion, comparison) and covers the topics of correlation and simple linear regression.

In addition, the university skills course (SKL 001) 'provides knowledge to enhance university skills, encompassing both academic and personal capabilities among students, and implements those skills during their university phase' (CBE at QU; https://cbe.qu.edu.sa/content/pages/1458).

Thus, CBE students must pass each course (the pass mark is established at 60%) to qualify for enrolment, without the stipulation of meeting a specific grade threshold. Importantly, the grades from these courses are not factored into the student's overall GPA for their degree. This approach ensures the student's GPA remains unaffected. The central objective of the PYP is to prepare students for higher education, amplify their prospects of success and reduce failure rates.

2.6.2 Accounting Education at Saudi Arabian Universities and its Development

In 1957, KSU in the Saudi capital (Riyadh) established the first accounting department in the country. Following this, KAU in 1967 and King Fahad University of Petroleum and Minerals in 1974 established colleges of economics and administration. These three institutions offer undergraduate and postgraduate accounting courses (Abdeen & Yavas, 1985). At first, Saudi students were provided accounting education only by these three departments. Over the years, accounting education departments have expanded (Al-Nafea, 2005) and to date, 43 universities across the country provide a four-year Bachelor of Accounting (BBA). As a result of the expansion of the economy requesting more accounting graduates in Saudi Arabia, the number of universities and students studying accounting has increased over the last decade.

Among the Saudi Arabian universities providing accounting programs, around 32% (14 universities) are private, with the majority established in the past decade (AlMotairy & Stainbank, 2014; Al-Nassar et al., 2022). Currently, six universities—KAU, KSU, QU, Imam Mohammad Ibn Saud Islamic University, King Khalid University (KKU) and University of Tabuk—offer advanced studies with a master degree in accounting. Only two of these universities (KSU & QU) offer a master degree in the English language. Moreover, only three universities (KSU, KAU & KKU) offer a PhD in accounting.

Since 2006, there has been a notable increase in the number of universities and students pursuing accounting in Saudi universities, driven by the rise and development of government institutions (AlMotairy & Stainbank, 2014: Al-Nassar et al., 2022). In 2004 there were only seven government (public) universities offering accounting programs; today, there are 29. One interesting factor contributing to the growth in demand for tertiary-level accounting education is the increase in the number of women who are matriculating to universities (Al Mallak, 2018).

The college council at each university determines the curriculum that will be offered in the accounting degree program. Each university is free to develop its own approach to teaching accounting. However, the majority of accounting degree programs in Saudi universities are identical and cover primarily the topics observed by AlMotairy and Stainbank (2014). Instruction is primarily delivered via traditional lectures, which include whiteboard demonstrations and textbook usage. In certain compulsory courses, the student-to-lecturer ratio can be as high as 80 to 1 during the lectures, as emphasized by Al Mallak (2018).

Accounting students typically take around 129 credit hours for their BBA at a Saudi university. It is estimated that accounting courses account for 60 credits or 46.6% of the total number of credits earned at university. Additionally, 54 credits in general business and economics are required as part of the college program; that is, 41.8% of the total course load. Approximately 11.6% of the coursework is devoted to university requirements, which amount to 15 credits. To be admitted to the accounting degree program, students must hold either a General School Secondary Certificate or Commercial School Secondary Certificate. In addition, commercial school students must have achieved excellent grades in their final examinations (Al Mallak, 2018; Al-Rehaily, 1992).

Table 2.4: Four-year bachelor degree curriculum credit hour requirements

Description	Course credit hours	Percentage
Requirements for university admission (Islamic, social, cultural & Arabic skills)	15	11.62
Academic requirements (general business & economics)	54	41.86
Requirements of the accounting department	60	46.51
Total	129	100

The demand for accounting programs among students has increased recently (Al-Nassar et al., 2022). Almost every sector of business now recognises the importance of accounting (Al Mallak et al., 2020). Due to this heightened interest, students are making informed decisions when choosing their specialties in business colleges. Accounting is considered one of the most important disciplines in business colleges (AlMotairy & Stainbank, 2014; Al-Nassar et al., 2022).

For a master degree in accounting, in contrast, students typically undertake around 36 credit hours over a two-year period in the BBA at a Saudi university. Mandatory accounting courses are comprised of 21 credits, representing 58.3% of the total credits earned at the university. Additionally, another 9 credits—equating to 25% of the overall course load—come from courses outside the department but remain a requisite part of the college program. The remaining 16.6% of coursework—equivalent to 6 credits—is allocated to elective courses in the accounting discipline. From these, students have the flexibility to select three out of the seven courses provided by the department.

Table 2.5: Two-year master degree curriculum credit hour requirements

Description	Course credit hours	Percentage
Three elective courses out of seven provided from the department	6	16.66
Academic requirements form outside the department (3 courses)	9	25
Requirements of the accounting department (7 courses)	21	58.33
Total	36	100

Table 2.6: Higher education grading scale (both bachelor & master) degrees

A+/A	5/4.75
B+	4.5
B	4
C+	3.5
C	3
D+	2.5
D	2
F	1

It must be noted that the description of these programs is relevant to QU for the bachelor and KSU for the master degree. However, as emphasised by AlMotairy and Stainbank (2014), even though each university possesses the freedom to design its own program, the majority of accounting programs across Saudi Arabia are very similar and cover predominantly the same topics.

The main reason for the similarity across Saudi college programs is their supervision by the ETEC. To better understand this, it is essential to delve into the historical evolution of this commission in Saudi Arabia. Initially, the Higher Education Council set up the National Commission for Academic Accreditation and Assessment in 2004 aimed to ensure quality in post-secondary education. Over time, the National Commission for Academic Accreditation and Assessment underwent various structural changes. By 2016, it had merged with other bodies to form the Education Evaluation Commission, reporting directly to the prime minister. This new entity was entrusted with the comprehensive evaluation of all educational and training facets in the country. Subsequently, it was renamed the National Centre for Academic Accreditation and Assessment, and by 2018, it had taken on its current identity as ETEC (ETEC, 2024).

The Education and Training Evaluation Commission (ETEC) holds several key responsibilities in advancing the quality of education in Saudi Arabia. These include accrediting higher education institutions and their academic programs, as well as supervising and coordinating national efforts aimed at achieving international academic accreditation. ETEC also plays a central role in maintaining quality standards across accredited institutions and their offerings. Additionally, it conducts evaluative studies to support and strengthen the performance of Saudi Arabian institutions and programs. The commission actively collaborates with various relevant sectors, both domestically and internationally, and is authorised to grant accreditation to international educational institutions and programs operating within and outside Saudi Arabia.

2.6.3 Higher Education Assessments in Business Colleges at Qassim University and King Saud University

The assessment system in the CBE at QU specifies how student achievement should be measured. Both formative and summative evaluation methods are employed to assess student performance. According to the college syllabus, each course requires students to be assessed three times per semester: twice through mid-term exams and once through a final exam. Summative evaluations are used for grading all courses. Mid-term exams contribute to 40% of the final grade, with each exam accounting for 20%. The final exam contributes another 40% to the final grade. Mid-term exams are conducted during regular school days, while the final exam takes place during the last three weeks of semester. The

remaining 20% of the grade is divided among assignments, quizzes and class participation. The instructor has the discretion to determine the specific percentage allocated to each component. To pass a course, the student must receive a total of 60%. There is no limit to the number of times a student may retake a course as long as their overall GPA is at least 2.00 out of 5.00. If a student's overall GPA falls below 2.00, they will lose their stipend. If the student's overall GPA remains below 2.00 for three consecutive semesters (and sometimes even five), they must leave the university.

For the Master of Accounting program in the CBA at KSU, students are assessed twice per semester per course, with one mid term and one final exam. Summative evaluations are used for grading all courses. The mid term exam accounts for 25% of the final grade, as does the final exam. Mid-term exams are held during regular school days, while the final exam is scheduled for the last three weeks of semester. The remaining 50% of the grade is comprise of quizzes, presentations, assignments and projects; however, this distribution may vary from course to course.

2.7 The Saudi Organisation for Certified Public Accountants and its Rules in the Saudi Arabian Accounting Context

SOCPA was established in 1991 following the introduction of the Objectives and Concepts of Financial Accounting General Presentation and Disclosure standards by the Ministry of Commerce (Halbouni, 2006). Before SOCPA's inception, many entities predominantly relied on the Generally Accepted Accounting Principles (GAAP) from countries such as the USA and Britain (The World Bank, 2009). Earlier, in 1980, the Saudi Accounting Association (SAA) had been formed. However, since its establishment, SOCPA has evolved to function as an independent organisation. While SOCPA is geared towards the professional development of practicing accountants, the SAA places a greater emphasis on academic and accounting education (Albader, 2015). The SAA offers guidance to accounting educational institutions, especially concerning the adoption of International Financial Reporting Standards (IFRS), among other topics. It is worth noting that there is a significant collaboration between SOCPA and SAA, with several professionals being members of both bodies (Albader, 2015).

In 2012, SOCPA approved a plan to implement IFRS, called the SOCPA Project for Transition to International Accounting and Auditing Standards. A new version of IFRS

(including interpretations) was adopted by SOCPA in 2016, without amending any requirements of IFRS. In accordance with this convergence plan, all listed companies were required to adopt IFRS by the beginning of the 2017 financial year. Thus, accounting students in Saudi universities who wish to become accountants must have a basic understanding of IFRS, understand the information contained in financial statements and be aware of changes in Saudi accounting and reporting rules, including the impact of these changes on business entities and financial statement users (Ebaid, 2021).

Additionally, SOCPA plays a crucial role in formulating official auditing and accounting standards, which encompass the presentation of financial statements and measurement methodologies. It also delineates a code of professional conduct. To ensure that Certified Public Accountants (CPAs) adhere to these standards and other SOCPA regulations, the organisation conducts regular quality review programs (Al Mallak, 2018). Further, SOCPA hosts a variety of professional development programs and continuing education courses to uphold and elevate the calibre of professional accounting in Saudi Arabia. It also boasts a dedicated accounting library, which houses an array of books, research papers and databases containing professional standards and regulations from across the world (SOCPA, 2004). It is essential to highlight that these initiatives complement SOCPA's broader objectives, which also encompass research and international collaboration (SOCPA, 2004).

Because of its plan to complete the IFRS transition by 2017, SOCPA reached out to the Ministry of Higher Education to incorporate certain standards into university accounting courses. Specifically, these standards refer to the International Education Standards for Professional Accountants (IESs) as well as other statements made by the International Accounting Education Standards Board (IAESB) (Alzeban, 2016). Among the courses included in the proposed plan are accounting, auditing, ethics and quality control. SOCPA hoped that this inclusion would enable the shift to IFRS in 2017, as students graduating then would be adequately equipped. Nevertheless, as AlMotairy and Stainbank (2014) noted, Saudi Arabian universities maintain autonomy over their accounting curricula and are not obliged to follow SOCPA recommendations.

While the transition to IFRS became mandatory for listed companies by 2017, it is important to consider the academic landscape's response to this shift. In a strategic move, SOCPA collaborated with universities across Saudi Arabia to embed IFRS into their

curricula. This alignment was pivotal in ensuring that the next generation of accountants and financial professionals would be well versed in these global standards (Almansour, 2019; Alzeban, 2016).

In response to SOCPA's initiative, a significant number of business colleges at Saudi Arabian universities proactively overhauled their curricula to be in sync with IFRS. This adaptation indicates a forward-looking approach by educational institutions, recognising the importance of global financial reporting standards in today's interconnected business world (Almansour, 2019). Nonetheless, a minority of accounting colleges have yet to fully integrate IFRS into their coursework. While these institutions acknowledge the importance of IFRS, they are still in the transitional phase, fine tuning their curricula to ensure comprehensive coverage and understanding of the standards and the absence of IFRS education in Saudi universities' accounting curricula as observed by Al-Dhubaibi (2022).

2.8 The Association to Advance Collegiate Schools of Business and Accounting Programs in Saudi Arabia

In recent years, business education has significantly evolved, moving towards aligning academic programs closely with practical, real-world benchmarks (Aldhaen & Braendle, 2023). This shift is driven not only by the academic community's dedication to excellence but also by the demands of prestigious accreditation organisations like AACSB International (Buttermore, 2010). The AACSB was founded in 1916 when the first accreditation standard was developed (Lagrosen, 2017). The latest version of the standards developed since that time was established in 2013 (Lagrosen, 2017). The AACSB, recognised globally for its accreditation standards, emphasises the importance of integrating industry-relevant, practical elements into business college curricula, reflecting a broader trend towards practical application in academic fields (Scott, 2021). Therefore, the AACSB's core objective is to strive for continuous quality improvement in three areas: engagement, innovation and impact (Lagrosen, 2017). Any business college seeking accreditation from the AACSB must apply based on these key elements. This means that all members of the institution are required to promote ethical behaviour, create a collaborative learning and working environment, engage with the community and address current and future issues related to corporate social responsibility (Claybaugh et

al., 2020; Tapis & Priya, 2020; Woodside, 2020). Further, membership in the AACSB is mandatory for the business college (Lagrosen, 2017). An important criterion for AACSB assessment is that a well-defined structure exists to ensure accountability and responsibility for continuous improvement (Lagrosen, 2017). Finally, the school must demonstrate compliance with AACSB standards, as well as provide timely and accurate information to the accreditation body.

In Saudi Arabia, following the establishment of new universities and schools and the implementation of Saudi Arabia's Vision 2030, the Saudi Arabian higher education sector has seen a radical improvement in recent years (Almotairy, 2016; Bataeineh & Aga, 2023). This has compounded the problem facing accounting education. According to Saudi Ministry of Education regulations, public Saudi universities are established and funded to provide free education and support the government's mission to provide quality education to all Saudi citizens (Ministry of Education, 2024). However, only a few universities have achieved accreditation from internationally recognised bodies like the AACSB; they include King Fahd University of Petroleum and Minerals, Prince Sultan University, KAU, KSU and QU, the latter two providing the data for this study (AACSB, 2018).[1]

2.9 Summary

A comprehensive overview was provided in this chapter of Saudi Arabia's historical, cultural, economic and educational contexts, with an emphasis on the admission criteria for accounting programs at universities. Through a detailed breakdown in various sections, the chapter provided an overview of the many influences on Saudi Arabian education, particularly accounting education.

Chapter 3 will provide a comprehensive review of studies on admission methods and their impact on the academic performance of undergraduate and postgraduate students, both globally and in the context of Saudi Arabia.

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[1]AACSB; https://www.aacsb.edu/-/media/documents/accreditation/2018 business%20standards.pdf).

Chapter 3: Literature Review

3.1 Introduction

This chapter presents a comprehensive review of admission methods related to the academic performance of students in undergraduate and postgraduate studies. This includes a review of the challenges encountered by countries beyond Saudi Arabia regarding selection of different admission methods and their implications for predicting academic performance. This chapter also reviews studies based in Saudi Arabia to investigate HSGPA, CEE and gender considerations in predicting the academic performance of undergraduate studies. It also explores how the PYP influences the route of academic admissions. Finally, the chapter delves into the impact of English language proficiency measured by IELTS on relative academic performance in accounting programs.

The term academic performance, although with different interpretations in the literature (Araujo et al., 2017; Young & Reinkensmeyer, 2014) is often used interchangeably with academic achievement or academic success (Alyahyan & Düştegör, 2020). Parker et al. (2004) measured academic achievement by GPA, which is a grade system used in universities to assess students' academic performance (Choi, 2005) or grades (Bunce & Hutchinson, 2009). Algarabel and Dasi (2001) defined achievement as an individual's competence in a particular area of knowledge, with performance being the observable aspect. They added that the prevailing perspective suggests that reaching a particular performance level often requires utilising advanced cognitive tools such as strategies, heuristics or skills. However, it is important to note that the end result and the methods employed to achieve it must be closely linked, which is often disregarded in the literature (Algarabel & Dasi, 2001). Yusuf (2002) argued that academic achievement should be measured using standardised tests constructed to meet national educational standards. For example, Yen and Liu (2009) explored the success of distance education in community colleges by analysing students' final course grades as the sole metric. According to Choi (2005), students' academic achievement is ultimately improved when they successfully complete course activities. Although Choi (2005) related the term 'success' to the completion of course assignments and the term 'academic achievement' to GPA, both terms were used to refer to traditional measures of academic student success (grades &

GPA). This is particularly evident in accounting education, where the terms academic performance (Baldwin & Howe, 1982; Eskew & Faley, 1988; Evans & Farley, 1998; Farley & Ramsay, 1988; Farley & Yang, 2020; Jackling & Anderson, 1998; Rohde & Kavanagh, 1996; Yang & Farley, 2019), student success (Gul & Cheong Fong, 1993) and academic achievement are used interchangeably (Doran et al., 1991). Following the accounting education literature, this chapter adopts 'academic performance' as a proxy for student achievement and academic success in a course's intended learning outcomes, measured by grades in individual course, the FYGPA and the overall GPA of Saudi accounting students.

This chapter is organised as follows. Section 3.2 reviews literature based in countries other than Saudi Arabia on the validity of different tertiary admission criteria as predictors of academic performance in higher education. Section 3.3 focusses on review of the PYP. Section 3.4 reviews English language proficiency as predictor of academic performance. Section 3.5 focusses on review of studies based in Saudi Arabia and discusses gaps in the literature, and Section 3.6 summarises the chapter.

3.2 Tertiary Admission Criteria as Predictors of Academic Performance

Prediction of academic performance is a complex task. Abundant studies have been conducted to explore the capacity to predict academic performance, and what might be the most powerful and valid criteria for this purpose. A review of relevant studies suggests cognitive and non-cognitive factors have been used to examine student academic performance. Cognitive factors are indicated by standardised tertiary entrance exams such as the SAT and the ACT (American College Test) in the USA, A-Levels in the United Kingdom (UK), the Gaokao (national college entrance examination) in China, and GAT and AT in Saudi Arabia. Cognitive factors are also represented by measures of prior academic achievement such as HSGPA or equivalents like the Australian Tertiary Admission Rank (ATAR) in Australia. Some researchers (Crocker & Algina, 1986; Messick, 1989) have argued that predictive validity comes into play when a test is used to predict the probability of future results. However, studies reveal mixed results in predictive validity tests. Some researchers have found HSGPA to be the most powerful predictor of academic performance (see Alhurishi et al., 2021; Alshammari, 2020; Camara & Echternacht 2000; Elert, 1992; Fleming, 2002; Fleming & Garcia, 1998; Lawlor et al., 1997; Nagy & Molontay, 2021; Snyder et al., 2003; Warren & Goins, 2019;

Zheng et al., 2002), while others (see Al-Rukban et al., 2010; Al-Hattami, 2012; Althewini & Alkushi, 2020; Bettinger et al., 2013; Camara & Echternacht, 2000; Price & Kim, 1976) have contended that standardised tests are the most accurate tool for predicting academic performance. Other studies indicate that both HSGPA and CEE are significant in predicting future academic performance (Alhurishi et al., 2021; Bridgeman et al., 2000; Kuncel et al., 2005; Moffat, 1993; Qahmash et al., 2023; Ramist et al., 1994; Snyder et al., 2003; Vista & Alkhadim, 2022; Waugh et al., 1994; Westrick et al., 2019). According to Pitman (2016), many universities adhere to a merit-based admissions system in which admission decisions are largely based on scores from combined standardised admission tests and previous academic achievements (e.g., HSGPA). The objective of this method is to not only maintain a high level of academic quality in an institution, but to also predict a student's ability to succeed in the challenging environment of higher education

The American Educational Research Association's Standards for Educational and Psychological Testing (1999, p. 180) defined predictive validity as 'the accuracy with which test data can predict later-obtained criterion scores'. Initially, numerous empirical studies across the world have explored the relationship between HSGPA and CEE in predicting academic performance. Predicting the potential for student success is a complex challenge, particularly as the number of applicants often exceeds the capacity of higher education colleges (Alshumrani, 2007). As such, it becomes crucial to identify the most likely students to succeed in their academic pursuits. The criteria used to determine this potential vary significantly among colleges, making it difficult to determine the most effective predictors of academic performance in a degree program.

Scholars have long debated the complex and multifaceted ways in which admission criteria predict academic performance. Research from around the world shows a range of findings that keep this discussion active and evolving. For instance, some studies (e.g., Bai et al., 2014; Betts & Morell, 1999; Cohn et al., 2004; Crowther & Briant, 2021; Kobrin et al., 2008; Richter & Trede, 2008; Sawyer, 2013; Shaw et al., 2011; Takele, 2017; Westrick et al., 2019; Zwick, 2023) indicate that both HSGPA and CEE are significant predictors of student performance at university. Further research suggests that HSGPA is a stronger indicator of future academic performance and is more reliable than CEE or any other factor (e.g., Al Hazaa et al., 2021; Cliffordson, 2008; Elert, 1992; Geiser

& Santelices, 2007; Geiser & Studley, 2002; Hood, 1992; Molontay & Nagy, 2023; Nagy & Molontay, 2021; Niu & Tienda, 2010; Warren & Goins, 2019). Other studies (e.g., Al-Hattami 2012; Baik et al., 2019; Bettinger et al., 2013; Camara & Echternacht 2000; Farley & Yang, 2020; Häkkinen, 2004; Price & Kim 1976; Russell et al., 2021) show that the accuracy of predictions for academic performance improves when using results from the CEE.

A review of the predictors of academic performance in the USA context, focussing on HSGPA, SAT and ACT scores, reveals a vibrant debate. The early work of Larson and Scontrino (1976) identified a significant association between overall GPA and predictions based on HSGPA and SAT scores. Despite this, they pointed out that although SAT scores had a statistically significant effect, they had only a small impact on the overall predictive accuracy, especially for female students. Likewise, Baron and Norman (1992) concluded that while SAT scores may be used to predict grades in specific courses, they had little impact on overall performance when other factors, such as high school class rank and ACT scores, were considered at the University of Pennsylvania. In contrast, Price and Kim (1976) argued that the ACT was a more reliable predictor of academic performance than HSGPA. Other studies (Hood, 1992; Ting, 1998) claimed that the ACT score was not a reliable indicator of student academic performance.

The debate has continued into the 21st century, with Geiser and Studley (2002) and Geiser and Santelices (2007) underscoring the predictive power of HSGPA not just for the FYGPA, but for academic performance across the four-year college study. The narrative has been nuanced by others (e.g., Betts & Morrell, 1999; Cohn et al., 2004; Sawyer, 2013; Westrick et al., 2019) who illustrate that the best way of predicting future performance is to combine SAT with HSGPA. Cohn et al. (2003) suggested that omitting SAT scores could have unfavourable outcomes with support for this claim from other (Cornwell et al., 2008; Kobrin et al., 2008; Mattern & Patterson, 2011a, b, c). Moreover, Shaw et al. (2011) revealed that the correlation between SAT scores and HSGPA varies across fields of study. In particular, SAT demonstrated high predictive validity for GPA in STEM fields, while enhancing the predictive validity of HSGPA across all disciplines. Further, according to Warren and Goins (2019), high school students' GPAs were positively related to their first semester college GPA. This finding highlights the critical role played by high school academic preparation and success in the outcomes for students in college,

at least at the beginning of their college journey. Niu and Tienda (2010) extended the argument by revealing that the environment and quality of a high school have a more significant impact on college success than CEE scores. Likewise, Zwick (2023) has recently reported that, although the ability of standardised tests (SAT & ACT) at predicting academic success is lower than that of HSGPA, combining them with HSGPA improves college success prediction. Recent experimental evidence by Chen and Jin (2025) indicated that CEE such as the SAT and ACT remain strong predictors of college academic performance, even after controlling for other observable student characteristics.

Australia's university admission system primarily relies on the Australian Tertiary Admission Rank (ATAR). The ATAR is a commonly used admission criterion for Australian universities. The system uses a percentile rank to compare an applicant's performance with other students in their national cohort (Pilcher & Torii, 2018). Introduced in 2010 as a replacement for the previous regional university index, the ATAR assesses an applicant's ranking relative to other individuals aged between 16 and 20 years. Additionally, universities may establish their own selection criteria, which can include a personal statement, a portfolio and interview, alongside the ATAR (Blyth, 2014; Pilcher & Torii, 2018). Although ATAR has traditionally been used as a predictor of future university success (Baik et al., 2019), a review of various studies suggests contradictory viewpoints regarding its predictive accuracy. Some studies (e.g., Anderton, 2017; Birch & Miller, 2005; Crowther & Briant, 2021; McKenzie & Schweitzer, 2001; Norton, 2016; Russell et al., 2021) support the use of the ATAR as a reliable indicator of a student's university performance. However, Dobson and Skuja (2005) argued that ATAR scores were not effective predictors of student outcomes in fields such as information technology, humanities and business. Further, Palmer et al. (2011) claimed that ATAR scores only indicate future performance at the very high and low ends of the range.

The UK employs A-Levels (Advanced Level of the General Certificate of Education) as central component of its university admission criteria (Rowbottom, 2013; Smith & Naylor, 2001). According to (Kirkup et al., 2008, p. 25):

> A-Levels are studied between the ages of 16 and 18 years. The first year of A-Levels is called the AS level and the second year is called A2; together they make up the A-Levels. Generally, students take examinations at the end of both years. The curriculum is set by the government, but the examinations and specifications (syllabuses) are set

> by individual boards. The examination is subject to a separate grade for each curriculum area. Typically, students study only three or four subjects, rather than the broad curriculum typical of most other countries. All subjects are graded from A to E and typically students need three or four good A-Level grades to gain entry to a top UK university

According to Bassett et al. (2009), A-Levels are primarily university entrance exams, with 76% of students who take them entering university. A variety of subjects is offered, including traditional disciplines such as mathematics, physics, chemistry, biology and English, as well as contemporary fields such as media studies, psychology and sociology (Bassett et al., 2009).

It was found by Smith and Naylor (2001) and Birch and Rienties (2014) that A-Level scores are associated with student academic performance at college. Likewise, Kirkup et al. (2010) assessed a number of measures of pre-university attainment and concluded that the average A-Level score was the most reliable indicator of participation in universities and degree classification. Further, Green (2011) found that A-Levels are significantly related to overall academic performance among students studying business at university.

Access to tertiary education in France depends on the successful completion of the national baccalaureate examination (Morlaix & Suchaut, 2014). This examination encompasses different streams, namely the general, science technical and vocational baccalaureate (Duguet et al., 2016; Morlaix & Suchaut, 2014). In the baccalaureate, every question must be answered in the form of an essay (Watanabe, 2015). Even the mathematics and science exams require students to explain how they arrived at the answer. In addition, in the humanities and social sciences, written formats are strictly prescribed, with the French-style essay known as a dissertation being the most commonly utilised format (Watanabe, 2015).

Morlaix and Suchaut (2014) concluded that the type of baccalaureate and grade were associated with first-year university academic performance. Moreover, Michaut (2000) and Morlaix and Suchaut (2012, as cited in Duguet et al., 2016) reported that the type of baccalaureate is a defining indicator of academic performance.

The literature regarding the Chinese Gaokao efficacy in predicting university success in China reveals a nuanced debate. Students and graduates from Chinese high schools are

primarily admitted to Chinese universities through Gaokao, an intensive and competitive exam held annually during the summer for students in their final years of high school, as well as graduates, with some regional variation (Davey et al., 2007). Gaokao serves as the key to entry to the majority of undergraduate programs. In general, Gaokao is structured as '3+X'. The '3' signifies the three mandatory subjects: Chinese, mathematics and a foreign language (typically English for the majority of candidates), with 150 marks assigned to each subject. The 'X' represents an additional set of subject tests that differ depending on whether a student selects the humanities or sciences track. The humanities stream examines history, politics and geography, whereas the sciences stream examines physics, chemistry and biology. All these subjects are generally weighted at 100 points each (see Farley & Yang, 2020, p. 473).

Bai et al. (2014) found that the Gaokao score, along with HSGPA and various admission routes, reliably predicted academic performance across four years at two universities. In addition, Yang (2014) provided more insights into the correlation between Gaokao score and university grades, which could vary depending on the specific subjects taken during Gaokao. This suggests that while Gaokao may be a solid predictor for some subjects, it may be less accurate for others. Extending this comparison internationally, Farley and Yang (2020) evaluated the comparative validity of Gaokao to a Western end of-secondary school performance measured by ATAR, when applying to Australian undergraduate programs. Their study found that Gaokao was as effective as ATAR in predicting the academic performance of Chinese students in Western undergraduate courses, when adjusted for gender and time.

Sweden's higher education admission system requires two main criteria: upper-secondary school grades or the Scholastic Assessment Test (SweSAT) (Lyrén, 2008). According to Stage and Ögren (2004), the purpose of the SweSAT is to rank candidates according to their academic potential by assessing their ability to study. This test consists of four sections: vocabulary; Swedish & English reading comprehension; data sufficiency; and diagrams, tables and maps. Admission to universities is based either on HSGPA or SweSAT scores—not a combination of both—making the SweSAT an optional test for applicants (Lyrén, 2008). Cliffordson (2008) indicated that the predictive validity of HSGPA is higher than that of SweSAT scores.

University admission in Hungary is based on the Matura, a national exit examination taken at the end of secondary school that includes four mandatory subjects: mathematics, Hungarian language and literature, history, and a foreign language. Nagy and Molontay (2021) elucidated that although the centralised entrance score in Hungary is a substantiated predictor, its predictive validity exhibits considerable disparity across diverse academic disciplines such as engineering and technology; economics and social sciences; and natural sciences. Molontay and Nagy (2023) conducted an additional study that evaluated the predictive validity of the composite admission score, concluding that while the current admission scoring system is effective, it may benefit from a greater emphasis on general knowledge, as well as a revised scoring system for advanced-level exams. In contrast, Ferrão and Almeida (2019) found that the CEE is the most effective indicator of first-year academic performance among other factors.

Turkey's admission process is shaped by the national university entrance exam (YOS), though its correlation with academic performance has been questioned. Ağazade et al. (2013) found a weak correlation between the Turkish University entrance exam (YOS) and FYGPA performance. In addition, it was found in the research that there are differences in results between disciplines, illustrating that it is important to test each discipline individually to obtain the best prediction. Similarly, in Germany, Richter and Trede (2008) illustrated that grades from high school and scores on standardised tests measuring mathematical–analytical abilities are good indicators of student grades in economics courses and related courses; however, HSGPA and other measures of cognitive abilities have only slightly lower predictive power than standardised test for student progress in the degree.

Admission to higher education in Chile traditionally required students to take the University Selection Test (PSU), a standardised exam administered at the end of high school (Gallegos Mardones & Campos-Requena, 2021). Developed in 2003, the PSU focusses on evaluating knowledge in specific subjects. According to Cárdenas and Truyol (2022), the Ministry of Education in Chile has assigned responsibility for managing the higher education admissions system to the Undersecretary of Higher Education. A major change was replacing the PSU with the Transition Test (PDT). In comparison to the PSU, the revised PDT contains a broader range of content and introduces new question types designed to evaluate key academic skills (Cárdenas & Truyol, 2022). Cárdenas and

Truyol (2022) reported that a single admission criterion indicator was not an effective predictor of academic performance for a group of first-year engineering students. Moreover, Gallegos Mardones and Campos-Requena (2021) argued that alternative admission criteria, such as the type of high school (public or private) and sociodemographic characteristics, have the potential to create a more equitable higher education environment to the traditional admissions process.

Studies in Ethiopia found that CEE was limited in its ability to predict student performance at university (Olani, 2009; Takele, 2017). However, in Yemen, Al-Hattami (2012) found CEE was the best predictor of student academic performance. Additionally, in Egypt where the main admission criterion is HSGPA, Amr Naga (2022) indicated that current input admission variables can only predict student performance to a limited degree. In Qatar, a study conducted by Al Hazaa et al. (2021) examined the effect of HSGPA, class attendance and sociodemographic factors on undergraduate academic performance at Qatar University, with a particular focus on courses where students receive grade D, F (fail) or W (withdrawn) grades. The results demonstrated a significant negative relationship between HSGPA and the probability of receiving DFW grades. The results demonstrate that students with higher HSGPAs were less likely to receive DFW grades. Recent findings by Mosia et al. (2025) demonstrated that admission point scores have a relatively weak and statistically uncertain relationship with academic performance in a South African Actuarial Science program, suggesting limited predictive validity when controlling for other factors such as mathematics proficiency in Grade 12 and socioeconomic background.

The previous discussion showed that each country across the world has its own admission criteria system, and the validity of predicting academic performance varies (Aciro et al., 2021).

Table 3.1: Summary of studies investigating admission criteria and predicting academic performance

Study (authors, publication year)	Explanatory variables	Predicted variables	Theory	Data	Key findings	Country of study
Price & Kim (1976)	HSGPA & ACT	Overall GPA	No	Secondary data/univariate & multivariate	College performance is positively linked to both HSGPA & ACT scores, with exam scores generally having a greater impact. However, HSGPA & ACT scores in natural sciences negatively affect GPA.	USA
Larson & Scontrino (1976)	HSGPA & SAT (verbal & mathematical)	Overall GPA	No	Secondary data/univariate & multivariate	Consistent high correlation found between 4-year college GPA & both multiple regression predictions involving all three variables combined as well as predictions based on high school GPA as a single predictor. Also, SAT scores did not add substantially to accuracy of prediction equations for females, although they were statistically significant.	USA
Baron & Norman (1992)	High school rank, SAT & ACT	Overall GPA	No	Secondary data/univariate & multivariate	High school class rank & ACT added significantly to overall prediction, whereas SAT did not.	USA
Ting (1998)	ACT, first-year generation & income	FSGPA	No	Survey	ACT composite score was not a reliable indicator of academic performance as indicated by first semester GPA.	USA
Geiser & Studley (2002)	HSGPA, SAT I & SAT II (ACT)	FYGPA	No	Secondary data/univariate & multivariate	As a whole, high school GPA predicts freshman GPA slightly better than do SAT scores; however, the combination of SAT & HSGPA predicts freshman grade averages most accurately.	USA
Geiser & Santelices (2007)	HSGPA, SAT I & SAT II	1st year GPA, 4th year GPA & 4-year graduation	No	Questionnaire	HSGPA is a strong predictor of both freshman & subsequent college performance across various disciplines & student groups in the University of California system. It becomes even more predictive over time, having a more substantial impact on 4th than on 1st year grades. Additionally, HSGPA shown to be a fairer admission criterion than standardised	USA

Study (authors, publication year)	Explanatory variables	Predicted variables	Theory	Data	Key findings	Country of study
					tests, as it has a less negative impact on disadvantaged & underrepresented minority students.	
Cohn et al. (2004)	High school rank, HSGPA& SAT scores, race & gender	GPA	No	Questionnaires	There is statistical significance at the 1% level in all of three variables, high-school rank, high school grade point average & SAT. White females have a significantly higher College GPA (CGPA) when other variables are held constant. In contrast, white males have significantly higher CGPA than non-White males & females.	USA
Betts & Morrell (1999)	HSGPA & SAT	College GPA	No	Secondary data/multivariate	Both SAT & HSGPA are significant predictors of CGPA, with an increase of one point in HSGPA resulting in an increase of only 0.053 points in CGPA.	USA
Cornwell et al. (2008)	HSGPA, SAT (maths, writing & verbal)	FYGPA	No	Secondary data/multivariate	SAT & HSGPA are significant in predicting academic success.	USA
Shaw et al. (2011)	HSGPA & SAT	Overall GPA	No	Secondary data/univariate & multivariate	The correlation between SAT & HSGPA varies across fields of study. In particular, SAT demonstrated high predictive validity for GPA in STEM fields, while enhancing the predictive validity of HSGPA across all disciplines.	USA
Warren & Goins (2019)	HSGPA	First semester GPA	No	Survey	HSGPA positively related to 1st semester college grades	USA
Kobrin et al. (2008)	Revised SAT & HSGPA	FYGPA	No	Survey	SAT provided an incremental gain in prediction over HSGPA alone & colleges should use both to make the best prediction of student success.	USA
Mattern & Patterson (2011a, b, c)	SAT & HSGPA	GPA of 2nd, 3rd, & 4th years	No	Secondary data/univariate & multivariate	The correlation between SAT & independently calculated annual GPA decreases slightly after the 1st year but maintains a positive relationship with cumulative GPA through the 4th year. More selective institutions exhibit higher validity coefficients for SAT. However, the	USA

Study (authors, publication year)	Explanatory variables	Predicted variables	Theory	Data	Key findings	Country of study
					effectiveness of HSGPA as a predictive measure slightly decreases across levels of institutional selectivity after the 1st year.	
Westrick et al. (2019)	SAT & HSGPA	FYGPA	No	Secondary data/logistic regression	Higher SAT strongly linked to better college grades, suggesting that SAT is as effective as HSGPA in predicting college success. However, combining SAT with HSGPA provides the most accurate prediction of student performance.	USA
Sawyer (2013)	ACT & HSGPA	FYGPA	No	Secondary data/hierarchical logistic regression model	HSGPA is more predictive of academic success in less selective admission contexts with moderate academic standards, while ACT scores are more crucial in highly selective environments with higher academic performance. Combining both significantly enhances the prediction of academic success.	USA
Zwick (2023)	This study summarises the history of college admissions testing in the USA; how SAT & ACT are used today in admissions				Despite standardised test (SAT & ACT) abilities in predicting academic success being lower than HSGPA, combining standardised tests with HSGPA improves college success predictions.	USA
Baik et al. (2019)	Academic orientation, sense of purpose, identity, engagement, comprehension skills, perceptions of		No	Survey	Students with low ATAR are less prepared for university, less capable of coping with university study & have lower levels of academic engagement than their peers.	Australia

Study (authors, publication year)	Explanatory variables	Predicted variables	Theory	Data	Key findings	Country of study
	teaching quality, & course satisfaction					
McKenzie & Schweitzer (2001)	ATAR	FYGPA	Tinto's model (1975)	Questionnaires	ATAR serves as a reliable indicator of a student's potential university performance.	Australia
Anderton (2017)	ATAR, gender, school type (government *v.* non-government), tuition fee, mode of entrance (direct *v.* alternative) & Socio-Economic Indexes for Area	FYGPA	No	Survey	ATAR & gender significantly predicted academic performance, with females generally outperforming males. Additionally, students from government secondary schools had higher FYGPA than those from private schools. While secondary school tuition fees positively correlated with ATAR scores, they negatively affected 1st-year GPA. Socioeconomic Status had a weak correlation with academic performance.	Australia
Dobson & Skuja (2005)	Equivalent National Tertiary Entry Rank	FYGPA	No	Secondary data	ATAR not an effective predictor of student outcomes in fields such as information technology, humanities & business.	Australia
Farley & Yang (2020)	ATAR, Gaokao, gender, year differences & Gaokao English	1st, 2nd & 3rd year subjects in Australian universities business degree	No	Secondary data/univariate & multivariate	Gaokao is as effective as ATAR for admissions when adjusted for gender & time, making it a viable alternative. Enhancements include incorporating Gaokao English results. Academic levels from offshore 1st year courses predict later performance similarly to onshore 1st year assessments.	Australia & China
Bai et al. (2014)	HSGPA, Gaokao & gender	1st, 2nd & 3rd year GPA &	No	Secondary data/univariate & multivariate	Across both universities, for all 4 years in the college HSGPA, Gaokao predicted undergraduate GPA. Females	China

Study (authors, publication year)	Explanatory variables	Predicted variables	Theory	Data	Key findings	Country of study
		cumulative GPA			obtained higher undergraduate academic grades than males over the course of 4 years of study.	
Yang (2014)	Gaokao subject tests (Chinese, maths, English and & composite)	GPA, 1st, 2nd, 3rd & 4th year	No	Secondary data/multivariate	There is a difference in the correlation between subject test scores & undergraduate grades based on the Gaokao tracks. Moreover, Gaokao subjects related to university learning show strong correlations with undergraduate grades.	China
Häkkinen (2004)	HSGPA & CEE	Overall GPA & graduation	No	Secondary data/ordinary least squares (OLS) regression model	In engineering & social sciences, entrance exams predict graduation & credit acquisition more accurately than does prior academic performance. However, in education, previous academic achievements are more indicative of graduation success.	Finland
Cliffordson (2008)	HSGPA & SweSAT	GPA	No	Secondary data/multilevel modelling approach	The predictive validity of HSGPA is higher than that of SweSAT scores.	Sweden
Nagy & Molontay (2021)	CEE, HSGPA & gender	Graduated/ dropped out	No	Secondary data/tobit regression & logistic regression.	Hungary's CEE score effectively predicts academic success, though its accuracy varies by discipline. HSGPA shows strong predictive validity, with general knowledge outperforming program-specific knowledge. However, the entrance score tends to underestimate female student performance & overestimate male student performance.	Hungary
Ağazade et al. (2013)	YOS	FYGPA	No	Secondary data/univariate	There is a correlation between Turkish entrance exam & student performance measured by 1st year GPA, although it is weak. The result differs among disciplines, which shows how important it is to test each discipline, which might have a different outcome.	Turkey
Richter & Trede (2008)	HSGPA & CEE	Economics & related courses	No	Secondary data/structural equation model	Grades from high school & scores on standardised tests measuring mathematical-analytical abilities are good indicators of student grades in economics & related courses; however, HSGPA & other measures of cognitive ability	Germany

Study (authors, publication year)	Explanatory variables	Predicted variables	Theory	Data	Key findings	Country of study
					have only a slight decline in predictive power as students progress in the degree.	
Cárdenas & Truyol (2022)	SUA	FYGPA	No	Secondary data/ univariate & multivariate	The single admission criteria (SUA) is not an effective predictor of academic performance for this specific group of 1st year engineering students, as it was not statistically significant.	Chile
Amr Naga (2022)	HSGPA, gender & proficiency level in English	Overall GPA	No	Secondary data/multivariate	Current admission variables are only able to predict student performance to a limited extent. HSGPA explained 28% of the variance in overall GPA, while English level & gender explained 9% & 5%, respectively.	Egypt
Olani (2009)	University entrance scores, aptitude test scores & preparatory GPA	1st semester GPA	No	Secondary data/multivariate	While CEE demonstrates considerable significance in predicting the 1st semester GPA of university students, its predictive strength is relatively limited, especially when compared to preparatory GPA.	Ethiopia
Takele (2017)	HSGPA & CEE (EGSECE)	FYGPA	No	Secondary data/multivariate & hierarchical multiple regression	HSGPA & CEE collectively accounted for 38.5% of the variance in FYGPA. However, HSGPA emerged as a superior predictor of college success, outperforming CEE.	Ethiopia
Al Hazaa et al. (2021)	HSGPA, class attendance & sociodemography	Course performance across four academic semesters	No	Secondary data/chi-square tests & multivariate	There is a significant negative relationship between HSGPA & the probability of receiving DFW grades (grades D, F, or withdrawal). Students with higher HSGPA less likely to receive DFW grades.	Qatar
Ferrão & Almeida (2019)	CEE, gender, age, admission first option & early repetition	FYGPA	No	Secondary data/variance components model & random coefficient model	The university entrance score is the most effective indicator of 1st year academic performance.	Portugal

Study (authors, publication year)	Explanatory variables	Predicted variables	Theory	Data	Key findings	Country of study
Russell et al. (2021)	ATAR	Grades in individual subjects in podiatry course, from 1st to 4th year	No	Secondary data/multivariate	Higher ATAR associated with better academic outcomes in 21 out of 29 podiatry subjects, with predictive strength ranging from weak to moderate depending on year level & type of subject.	Australia

Secondary data refers to academic results retrieved from an institution's student administration system.

3.2.1 A Comparison of Saudi Arabia's Admission Criteria with those Around the World

Saudi Arabia has a unique set of university admission criteria, being among the few countries worldwide that combines three major criteria: HSGPA, GAT and AT. Further, gender plays an important role in this context, with male and female students usually studying separately and being taught by different instructors. Additionally, the weighting of these scores in the Saudi Arabian admission process varies between genders. Thus, Table 3.2 provides a comparative between Saudi Arabia's admission criteria with those of other countries. This highlights both similarities and differences between them.

Table 3.2: Equivalence of admission criteria in the Saudi context compared with the rest of the world

Country	The main admission criteria		
Saudi Arabia	HSGPA	GAT	AT
USA	HSGPA	SAT or ACT	
Australia	ATAR		
UK	A-Levels		
France	Baccalaureate		
China	HSGPA		Gaokao
Sweden	HSGPA	SweSAT	
Finland		National Matriculation Examination	
Hungary	HSGPA	Matura	
Turkey	HSGPA	YOS	
Germany			
Ethiopia	HSGPA	EGSECE	
Chile			SUA
United Arab Emirates	HSGPA		
Qatar	HSGPA		
Egypt	HSGPA		

While Table 3.2 compares Saudi Arabia's admission criteria with those of other countries, it does not reflect the specific requirements of each country. The aim of this part of the review is to compare Saudi Arabia's different admission criteria with those used around the world. It is important to note, however, that these criteria are not necessarily identical, since each country has its own method for evaluating its students.

3.2.2 Studies Predicting Academic Performance in Accounting

Accounting is considered a challenging and complex program (Mat Bahari et al., 2014). Therefore, students pursuing an accounting degree at university need to overcome challenges of learning while completing their studies (Mohd Khalid & Abdul Rauf, 2023). The performance of accounting students at the tertiary level has been extensively studied, revealing a number of determinants. Researchers from around the world have examined how prior knowledge and performance (e.g., HSGPA, CEE, prior mathematics & accounting knowledge) affect accounting academic outcomes. Having the ability to predict student performance in a course or program provides the opportunity to evolve the quality of the education (Hellas et al., 2018). This section discusses research with reference to explanatory variables and results as well as the model used.

First, studies conducted in various countries, such as the USA (Carpenter et al., 1993; Larson & Scotrino, 1976; Kobrin et al., 2008; Price & Kim, 1976; Sawyer, 2010), Australia (Anderton, 2017; Auyeung & Sands, 1994; Evans & Farley, 1998; Farley & Ramsay, 1988; Farley & Yang, 2020; Rohde & Kavanagh, 1996), Malaysia (Zubairu & Sakariyau, 2016), South Africa (Papageorgiou & Halabi, 2014), Turkey (Onay & Benligiray, 2018), Kuwait (Khalid, 2012), Qatar (Al Hazaa et al., 2021) and Saudi Arabia (Al-Twaijry, 2010), have examined HSGPA as a predictive admission criterion for academic performance in accounting. Most of these studies found a positive relationship between HSGPA or its equivalent—such as ATAR—and accounting academic performance (Ahmet & Benligiray, 2018; Al-Anazi, 2012; Al-Twaijry, 2010; Anderton, 2017; Auyeung & Sands, 1993; Carpenter, 1993; Evans & Farley, 1998; Farley & Ramsay, 1988; Farley & Yang, 2020; Frakes, 1977; Kobrin et al., 2008; Larson & Scontrino, 1976; Papageorgiou & Halabi, 2014; Price & Kim, 1976; Rohde & Kavanagh, 1996; Sawyer, 2010; Xiang & Hinchliffe, 2019), while a few found no significant relationship (Al Hazaa et al., 2021; Zubairu & Sakariyau, 2016).

Second, studies conducted in the USA (Eskew & Faley, 1988; Gist et al., 1996; Kirk & Spector, 2006; Kobrin et al., 2008; Morgan, 1989), China (Farley & Yang, 2020; Yang, 2014), South Africa (Carpenter & Roos, 2021) and Singapore (Kho & Kho, 1999) have examined CEE such as SAT, and Gaokao as predictors of academic performance in accounting. Most found a positive relationship between CEE and accounting academic performance (Carpenter & Roos, 2021; Eskew & Faley, 1988; Farley & Yang, 2020; Gist

et al., 1996; Kho & Kho, 1999; Kobrin et al., 2008; Morgan, 1989; Yang, 2014) and only Kirk and Spector (2006) found no relationship.

Third, studies conducted in a range of countries, such as the USA (Baldwin & Howe, 1982; Doran et al., 1991; Xiang & Gruber, 2012), Australia (Farley & Ramsay, 1988; Jackling & Anderson, 1998), New Zealand (Beatson et al., 2020; Keef, 1988), Republic of Ireland (Byrne & Flood, 2008), the UK (Mitchell, 1988), Singapore (Kho & Kho, 1999), Malaysia (Mohd Khalid & Abdul Rauf, 2023; Tho, 1994), Hong Kong (Gul & Cheong Fong, 1993), South Africa (Papageorgiou & Halabi, 2014), Turkey (Benligiray & Ahmet, 2017; Onay & Benligiray, 2018) and Saudi Arabia (Al-Twaijry, 2010), examined the impact of prior accounting and math knowledge in high school on accounting student academic performance, with contradictory results. Some found an association between prior accounting and mathematics and academic performance in accounting (Al-Twaijry, 2010; Beatson et al., 2020; Byrne & Flood, 2008; Doran et al., 1991; Farley & Ramsay, 1988; Gul & Cheong Fong, 1993; Mitchell, 1988; Mohd Khalid & Abdul Rauf, 2023; Onay & Benligiray, 2018; Papageorgiou & Halabi, 2014; Tho, 1994; Xiang & Gruber, 2012), while others found no significant relationship (Baldwin & Howe, 1982; Benligiray & Ahmet, 2017; Jackling & Anderson, 1998; Keef, 1988; Kho & Kho, 1999). To exemplify these contrasting outcomes, Farley and Ramsay (1988) found that both academic ability measured via university entrance scores, and previous accounting knowledge significantly predicted first-year academic performance in accounting at Monash University. The study demonstrated how foundational knowledge from secondary education contributed to early conceptual understanding at the tertiary level. Similarly, Al-Twaijri (2010) indicated that mathematics proficiency and general academic achievement were significant predictors of success in managerial and advanced accounting subjects, whereas prior accounting knowledge had limited impact at higher levels. This suggests that the influence of prior knowledge may depend on the nature and complexity of the academic tasks involved.

In contrast, Keef (1988) found no significant effect of previous accounting experience on student performance across financial accounting, financial management, and management accounting. Mathematical ability had only a weak influence on some course components, indicating that secondary-level preparation may not reliably predict outcomes in all university contexts. Likewise, Benligiray and Ahmet (2017) found no

statistically significant relationship between prior accounting education and performance in Turkish accounting programs, raising questions about the adequacy of high school preparation for meeting the expectations of tertiary-level study.

Fourth, regarding the model used to analyse the data in previous studies in accounting education regarding predicting academic performance, some studies (e.g., Evans & Farley, 1998; Morgan, 1989; Xiang & Gruber, 2012) used univariate analysis employing a single explanatory variable at a time. Other studies (e.g., Al-Twaijry, 2010; Auyeung & Sands; 1993; Benligiray & Ahmet, 2017; Duff, 2004; Farley & Ramsay, 1988; Farley & Yang, 2020; Loveday, 1993; Mohd Khalid & Abdul Rauf, 2023; Papageorgiou & Halabi, 2014; Yang, 2014) utilised multivariate regression. Some studies (e.g., Farley & Yang, 2020; Messinis & Sheehan, 2015) adopted both univariate and multivariate models, while others conducted stepwise regression (e.g., Al-Anazi, 2012; Tho, 1994) or logistic regression (Al Hazaa et al., 2021; Anderton, 2017; Sawyer, 2010). Mitchell (1988), in contrast, utilised the Mann–Whitney test, Rohde and Kavanagh (1996) used a two-way analysis of variance (ANOVA) and Baldwin and Howe (1982) and Kirk and Spector (2006) conducted analysis of covariance (ANCOVA). Therefore, researchers have used a variety of analytical approaches to investigate the relationships between explanatory variables and academic performance in higher accounting education.

To summarise, the performance of accounting students has been examined globally using a variety of predictors and models. However, there is substantial debate regarding the role of HSGPA, CEE and prior (accounting & mathematics) knowledge in predicting academic success. Despite many studies suggesting there is such predictive power, other studies have not found a significant correlation between these variables. Therefore, further research is required, particularly in the context of Saudi Arabia.

3.2.3 Differences in Academic Performance across Genders

For decades, educators and psychologists have delved into the intricate patterns of academic performance variation between genders. There are evolving patterns of gender outcomes across various subjects when it comes to HSGPA and standardised tests. A review of the literature indicates that women normally perform better on verbal and achievement tests, while men excel at mathematics, although the gap is narrowing (Azen et al., 2002; Wilder & Powell, 1989). For example, Willingham and Cole (1997) found

that females often achieved higher school grades, while males performed better on standardised tests. Hyde et al.'s (1990) meta-analysis showed females outperformed males in early mathematics, but the trend reversed in high school and college.

When it comes to verbal skills, the literature offers conflicting insights. Despite Maccoby and Jacklin's (1978) suggestion that women have a significantly increasing verbal advantage, Hyde and Linn's (1988) study found that this difference is negligible. Further, the latter rejected the concept of age-related gender differences suggested by Maccoby and Jacklin (1974). In addition, there is a relationship between test format and gender performance. In a study by Bridgeman and McHale (1996), males and females scored similarly on essay tests, with males scoring higher on multiple-choice tests. Finally, in a recent study by Tsaousis and Alghamdi (2022), based on an analysis of 1,800 graduates, female students performed better than their male counterparts.

3.2.3.1 Differences in Academic Performance between Genders in the Accounting Discipline

The relationship between gender and academic performance in accounting at the tertiary level has been a topic of some discussion, though results have largely been inconclusive. It is noteworthy that differences in the learning approaches of male and female students have been identified, which emphasises the importance of examining the impact of gender on accounting performance. Such insights could potentially reshape the way accounting is taught (Elias, 2005). Over the years, the inclusion of gender as a determinant in predicting academic performance has yielded mixed findings.

Some studies suggest that men generally outperform women (Bielinska-Kwapisz et al., 2012; Koh & Koh, 1999; Lipe, 1989; Seow et al., 2014). Conversely, other findings posit that women surpass men in performance (Fraser et al., 1978; Manan & Mohamad, 2003; Mutchier et al., 1987; Syukur, 2021; Tan & Laswad, 2008; Tyson, 1989). However, a third perspective argues that gender does not significantly explain variance in performance (Buckless et al., 1991; Byrne & Flood, 2008; Canlar et al., 1988; Carpenter et al., 1993; Eskew & Faley, 1988; Gammie et al., 2003; Gist et al., 1996; Guney, 2009; Khalid, 2012; McDowall & Jackling, 2006; Okafor & Egbon, 2011; Opstad, 2023; Opstad & Årethun, 2020; Sithole et al., 2023; Tho, 1994; Tickell & Smyrnios, 2005; Uyar & Güngörmüş, 2011). In research in the accounting discipline, with high school class rank

considered a measure of general ability, gender was no longer a significant factor in introductory accounting performance (Buckless et al., 1991; Keef, 1989; Ramsay & Baines, 1994; Tyson, 1989). Doran et al. (1991) argued that males initially outperformed females in accounting courses; however, women outperformed males in subsequent semesters. In light of this array of findings, there is no definitive conclusion regarding the effect of gender on academic performance in accounting. Further, Bielinska-Kwapisz et al. (2012) indicated that males outperformed females in all majors of business, especially accounting, while Syukur (2021) claimed the opposite. Bycio and Allen (2007) and Opstad and Årethun (2020) also found that gender had no significant impact on business courses. However, there were exceptions: males excelled in macroeconomics, whereas females excelled in management and business law. Last, Opstad (2023) revealed that gender does not significantly impact performance in most subjects, with males performing better in some areas (e.g., macroeconomics & accounting) and females in others (e.g., applied microeconomics).

3.2.4 Other Factors that Predict Academic Performance

The factors that predict academic performance are numerous and diverse. Research has explored a list of factors that can predict a student's academic performance; for example, Socioeconomic Status (SES; e.g., Richardson et al., 2012; Rodríguez-Hernández et al., 2021; Westrick et al., 2015), age (e.g., Koh & Koh, 1999; Lane & Porch, 2002; Mohd Khalid & Abdul Rauf, 2023; Müller et al., 2007; Onay & Benligiray, 2018; Papageorgiou, 2017; Papageorgiou & Halabi, 2014), race/ethnicity (e.g., Jones, 2021; Steele-Johnson & Leas, 2013; Zhou, 2010), parents' background (Jones, 2021; Mayhew et al., 2016; Nichols & Islas, 2016; Palbusa & Gauvain, 2017), motivation/self-efficacy (e.g., Alhadabi & Karpinski, 2020; Al Shawwa et al., 2015; Beatson et al., 2020; Richardson et al., 2012; Van der Zanden et al., 2018) and high school type (e.g., Evans & Farley, 1998; Rodríguez-Hernández et al., 2021). This section reviews the literature regarding the factors that contribute to predicting academic performance in higher education.

3.2.4.1 Socioeconomic Status

Westrick et al. (2015) demonstrated that SES does not predict academic performance. In contrast, Rodríguez-Hernández et al. (2021) claimed that SES contributes to academic

performance. Richardson et al. (2012) found only a weak correlation between SES and academic performance.

3.2.4.2 Age

Regarding age, some studies have found (Koh & Koh, 1999; Müller et al., 2007; Papageorgiou & Halabi, 2014) that younger students perform significantly better in accounting courses than do older students. Conversely, Lane and Porch (2002) concluded that older students performed better in accounting than younger students. Mohd Khalid and Abdul Rauf (2023), Onay and Benligiray (2018) and Papageorgiou (2017) added to the debate and illustrated the age of students had no effect on academic performance.

3.2.4.3 Race/Ethnicity

Regarding ethnicity, Steele-Johnson and Leas (2013) provided evidence that race (African Americans & Whites) interacted with personality in predicting academic performance in terms of the college overall GPA. Other studies (e.g., Jones, 2021; Zhou, 2010) have found that ethnicity was not significant in regard to academic performance.

3.2.4.4 Motivation/Self-efficacy

The term 'motivational factor' was used by Richardson et al. (2012) to describe self-efficacy, self-esteem and goal orientation, as well as types of motivation, Additionally, Beatson et al. (2020) defined self-efficacy as belief in one's ability to succeed. According to Richardson et al. (2012), self-efficacy and grade goals were the strongest predictors of GPA among the motivational factors. Likewise, Al Shawwa et al. (2015) demonstrated that motivation for achievement and a clear goal had a significant impact on a student's GPA. Robbins et al. (2004) implied that self-efficacy was an important predictor of university success and may facilitate the transition from secondary education to university. Further, Beatson et al. (2020) revealed that self-efficacy, especially students' belief in their ability to succeed, was strongly correlated with academic performance.

3.2.4.5 Parents' Education

The literature demonstrates that parenting style has a significant influence on educational attainment and contributes to differences in cultural capital between first-generation and non-first-generation students (Nichols & Islas, 2016). Mayhew et al. (2016) asserted that

unlike students whose parents had at least some college experience, first-generation students' cognitive and intellectual gains were determined by attendance at a two-year institution and attainment of higher cumulative grades. Further, students are more likely to be able to rely on their parents' advice, guidance and encouragement as they adjust to college if they are aware of the college's expectations and processes (Palbusa & Gauvain, 2017). In contrast, Jones (2021) found no statistical significance regarding parents' educational backgrounds.

3.2.4.6 High School Type

Some scholars have claimed that the type of high school affects a student's academic performance. For instance, in a study conducted by Evans and Farley (1998), significant differences were found in the university performance of students based on the type of school they attended. Likewise, Rodríguez-Hernández et al. (2021) demonstrated that high school characteristics were vital predictors of students' academic performance in tertiary education.

Although the factors discussed above are important in predicting academic performance, some scholars have asserted that pre-academic performance remains the best predictor. For instance, Richardson et al. (2012) argued that prior performance of students (e.g., HSGPA & CEE) remains an excellent predictor of intellectual ability of students at higher educational institutions, even though the evidence supporting this claim tends to be inconsistent. Further, Palmer et al. (2011) claimed that prior academic achievement is consistently identified as the most effective factor in future academic performance. In the same vein, Alyahyan and Düştegör (2020) stated that prior academic performance is the most important predictor.

The main objective of this research is not to explore the factors that predict academic performance in higher education but to analyse current admission criteria based on the Saudi Arabia context and to what extent these criteria predict academic performance of accounting students. It is essential also to note that the main reason for not including these factors in this research is that they are typically obtained from questionnaires or surveys—which were not possible in this research—rather than university databases as secondary data. Moreover, Saudi Arabian universities, particularly their accounting programs, do not consider any other factors or require students to provide additional information

regarding—for instance—their race, ethnicity or family background. The only factor available and considered in this research is gender. Therefore, this research focusses only on existing admission criteria on which Saudi Arabian universities rely to accept students into their tertiary accounting education.

3.3 The Preparatory Year Program

Researchers have emphasised the importance of the transition from high school to higher education because it is an essential period that can significantly influence the student success (e.g., Coertjens et al., 2017; Kyndt et al., 2017). Transitioning from high school to higher education can be quite challenging because of changes in the educational environment, the assumption of new academic responsibilities, the establishment of new social connections, the creation of a new sense of self and the potential for increased academic competition (De Clercq et al., 2017; Van Herpen et al., 2020). Hence, ensuring a smooth transition to higher education is vital as it increases the likelihood of success in subsequent academic years (Van Rooij et al., 2017).

The first year at university is often considered the most crucial period for a student's academic performance. For decades, increasing first-year students' success has dominated higher education and policy discourses. This focus has developed as a result of the increasing number of students enrolling in higher education institutions (National Center for Education Statistics, 2007; Trow, 2007). In addition, most students who decide to leave university do so after or during their first year of study (Credé & Niehorster, 2012; Willcoxson et al., 2011). According to Droesbeke et al. (2008, as cited in De Clercq et al., 2017), 35% of Belgian first-year university students do not complete their freshman year and 25% discontinue their studies altogether. In a similar vein, the OECD reported in 2013 that European university freshmen face significant challenges in achieving satisfactory success rates.

Students enrolled in higher education are required to adapt to a variety of new and challenging situations, and thus the first-year experience is crucial to their success. Some adapt well; others do not. Studies reporting that some full-time students failed to succeed academically showed that inadequate attention was paid to preparing them for the transition (Yorke, 2000). In addition to the incorrect grounding of their choices of program and institution, considerations such as the type of accommodation were not

made. Moreover, institutions generally do not recognise the importance of properly inducting students and do not emphasise the first-year experience (Yorke, 2000). It was recommended, therefore, by Laing et al. (2005) that to help students manage the transition to higher education, there must be a thorough understanding of their needs and expectations and a process for introducing them to higher education's needs and expectations. Likewise, according to Erickson and Strommer (2005), first-year college students encounter many challenges when transitioning to higher education. A primary difficulty is academic preparation. They observed that many high school graduates are not sufficiently prepared for college-level academic standards, especially in fundamental subjects like English, science and mathematics. Further, students often lack the necessary academic skills, as college studies typically require a greater commitment of time for studying and completing assignments compared to high school. Recently, Perna (2024) has supported this claim.

In the Republic of Ireland, Higher Education Strategy Group, and Hunt (2011) argued that institutions of higher education should prepare first-year students more effectively to engage with their learning experience. Additionally, they recommended that students in their first year of undergraduate studies be provided with more interdisciplinary learning opportunities. The same report indicates that students entering higher education directly from high school are often lacking the critical thinking, problem solving and independent learning skills necessary for successful engagement in higher education (p. 55).

Students' first-year academic progress has a profound impact on their overall development in college; thus, there should be a strong emphasis on ways to improve first-year academic performance (Ribeiro et al., 2019). Likewise, researchers in the field of student success have placed a great deal of emphasis on first-year accomplishments, since an important degree of student attrition occurs during this initial period (Credé & Niehorster, 2012; Fokkens-Bruinsma et al., 2021). Thus, researchers and policymakers have begun to recognise the importance of the first-year experience (Fokkens-Bruinsma et al., 2021). According to research, dropout rates are higher in the first year of college than in later years (Van Rooij et al., 2018). This may because the first year is important in laying the preparation for successful learning in subsequent years (Krause & Coates, 2008). Further, Pascarella and Terenzini (2005) claimed that the first year is particularly

important for identifying students who are at risk in later years; therefore, it can be seen as the most advantageous time to intervene.

It is clear, therefore, that the first year of university is an important milestone in a student's academic journey, laying the preparation for academic performance in the future. There is no doubt that this period is important for shaping attitudes, adapting to new challenges and developing essential skills such as the ability to think critically. The high dropout rates during this phase demonstrate its importance and the difficulties students must overcome. Thus, researchers and policymakers consider the PYP an essential bridge between high school and university, designed to aid the transition between high school and university. Throughout the PYP, students are given opportunities to become familiar with the demands of tertiary education, ensuring that they are well prepared to succeed in their subsequent academic years.

The PYP represents an attempt to assist students to succeed in undergraduate study. Depending on the country, the PYP's objective differs in terms of duration and requirements, as well as content. This section discusses some popular PYPs across the globe and their impact on student performance.

3.3.1 University Readiness and the First-year Experience

Transitioning from high school to university can be particularly challenging for students who are not prepared academically (Parker et al., 2004; Perry et al., 2001). There is growing concern regarding the transition from high school to college (Porter & Polikoff, 2012). For example, despite a significant surge in post-secondary enrolment rates between 1975 and 2007 (National Center for Education Statistics, 2007), more than two-thirds of high school graduates heading to college in the USA (Greene & Forster, 2003) find themselves inadequately prepared due to deficiencies in high school completion, coursework or reading skills. Similarly, Tierney and Garcia (2011) revealed that in the USA, approximately 29% of all students enrolled in four-year institutions and 43% of students enrolled in two-year colleges required remediation. To ensure that students meet the standards of college readiness, it is the responsibility of higher education institutions to offer remedial courses and programs for their enrolled students.

Recently, Perna (2024) argued that a large number of high school students in the USA graduate without having received adequate academic preparation for higher education.

Similarly, Mokher (2021) argued that the majority of high school graduates who enter post-secondary education are not prepared for college-level work, resulting in high remediation rates and low levels of degree attainment. Consequently, this disparity between high school and college readiness has emerged as a prominent issue in USA education policy discussions (Conley, 2003; Kirst, 2005; Perna, 2024). However, this issue is not unique to the USA; for instance, in the Netherlands, approximately 33% of students do not complete their second year of study (Van Rooij et al., 2018). Conley (2010) argued that high school graduates should possess the requisite knowledge and skills for college pursuits, resulting in a shift in educational objectives. Therefore, there is an expectation that post-high school learning opportunities will prepare students for college.

It is clear that many challenges accompany the transition to college, and even the most successful students can find themselves unprepared (Holles, 2016). Porter and Polikoff (2012) indicated that, despite the emphasis on college readiness, little consistency has been observed regarding the definition of 'college readiness'. Therefore, college readiness has been defined in various ways. For instance, Conley (2007) defined it as the ability to enrol in and succeed in a credit-bearing general education course without remediation at a post-secondary institution offering a baccalaureate degree. Further, in Conley's (2008) study, four essential components were identified as essential to college preparation: (a) cognitive skills such as critical thinking and problem solving; (b) knowledge of fundamental subjects such as writing and algebra, which includes 'variables, equations, functions, and inequalities as fundamental mathematical concepts'; (c) academic behaviour, including time management and study strategies; and (d) college knowledge, including knowledge of higher education systems, admissions, financial aid and campus organisations. Additionally, Tierney and Garcia (2011) defined college readiness in three categories: academic, information and motivational. They stated that:

> Academic activities pertain to outreach activities aimed at overcoming academic deficiencies. Informational activities try to inform the student and his or her parents about the individual's readiness for college. Motivational and social activities aim to instill in the student a sense that college is a possibility (pp. 107 & 108).

In the context of Saudi Arabia, concerns regarding student readiness when transitioning from secondary school to higher education have arisen. According to Alanzi (2014), the

graduation rate over a 10-year period among enrolled students stands at only 50%. This underscores the ongoing challenge of ensuring students' preparedness for success in higher education (see Section 2.6.1). Research has shown that a significant number of high school graduates are unprepared for college (AlMoshari & AlSaud, 2012; Alnatheer, 2009). Moreover, a review of the literature highlights that many students exhibit deficiencies in mathematical skills, which are highly valued in most undergraduate programs (AlHarbi, 2012; Khoshaim & Ali, 2015a). Further, the Saudi media consistently reports on the shortage of practical and technical skills among high school graduates, raising concerns about their ability to successfully navigate college-level mathematics courses (Khoshaim & Ali, 2015b). For this reason, Saudi Arabian policymakers decided to provide additional support to students during their first year of higher education by requiring them to participate in the PYP, designed to reduce the challenges associated with transition from secondary to tertiary education (Khoshaim, 2017).

Students' academic preparedness is disparate during the transition from high school to college, which presents a significant challenge in ensuring their readiness. Therefore, college preparation programs and clear definitions of college readiness are essential for students to succeed in higher education (Harvey et al., 2013; Khoshaim, 2017). Moreover, recognising the need for intervention, it has been acknowledged that developing an independent learning habit and addressing students' readiness is one of the most critical tools for easing the transition (Bergsten et al., 2016).

3.3.2 Various Systems Related to Preparing Students Worldwide

Students in high school lack the skills and knowledge required for higher education (Lowe & Cook, 2003). This gap, known as the 'preparation gap', can be caused by numerous factors including a lack of challenging coursework in high school, inadequate academic support and advising, and a lack of emphasis on problem solving and critical thinking. The PYP is designed to help students transition from the high school education system to the university education system, introduce them to a variety of academic fields and prepare them for the university environment before they make a final decision regarding their academic interests (Khoshaim, 2017). The year also prepares them psychologically for their prospective fields of study (Al-Rabia et al., 2021, p. 72). The following sections explore the systems in various countries.

3.3.2.1 Summer Bridge Program (United States of America)

In the USA context, there have been significant changes in the objectives and missions of support programs in the past four decades to accommodate the needs of diverse student groups, including international students, non-native English speakers and students with disability (Kezar, 2000). Therefore, summer bridge programs are held during the summer before a student's freshman year and are regarded as a transitory period from high school to college (Sablan, 2014; Wathington et al., 2016). Students typically take an academic course and may learn social and academic skills important for the transition to college during the summer before classes begin. In many cases, students participating in the program are those needing additional transitional support, such as first-generation, low-income or remedial students (Kallison & Stader, 2012). Further, Kezar (2000) demonstrated that according to the objectives or mission of the program, students may be selected for participation according to a variety of criteria, including (a) belonging to a specific demographic group, such as first-generation, economically disadvantaged or underrepresented minority students; (b) majoring in mathematics and science, which are the focal areas of the program; and (c) undergoing testing or other assessments that indicate that they require remedial or additional academic assistance. According to Ashley et al. (2017), the main goals of bridge summer programs in the USA are academic success, psychosocial and department-level goals. In addition, Wachen et al. (2018) stated that summer bridge programs facilitate the transition from high school to college, increase academic performance, prepare students for college socialising and promote academic momentum.

Studies have produced mixed results regarding the impact of summer bridge programs on student performance. Wachen et al. (2018) evaluated a residential summer bridge program offered by multiple universities in the University of North Carolina System during 2008–14. The program was intended to facilitate the academic success of in-state students who were conditionally accepted or who met only minimum admission requirements for HSGPA or SAT scores, and who represented the lowest-performing 10% of the freshman class. Participants were required to complete college-level English and mathematics courses with a grade of C or higher to earn up to six college credits. Although the program primarily utilised existing student support services, it made some components of the summer program and the fall (autumn) semester mandatory.

Participants in the program were compared with non-participants who had similar characteristics on variables such as HSGPA and standardised test scores, using propensity score matching. The authors claimed that participation in the summer bridge program was positively associated with higher persistence rates in the second and third years of college, as well as a four-percentage-point increase in completion rates of degree programs within four years. Further, participants earned eight more credits than non-participants during their first year of college, and these gains were sustained throughout their second year. Similarly, Cabrera et al. (2013) argued that participation in the New Start Summer Program at the University of Arizona was significantly associated with a higher GPA once entering student characteristics were controlled. Even though participation in the program was significantly correlated with first-year GPA, the effect of participation became non-significant after controlling for college experiences during the first year. However, pre-college academic performance was the strongest predictor of first-year GPA—particularly high school academic GPA, followed by SAT verbal score. In addition, Douglas and Attewell (2014) demonstrated positive long-term effects of summer bridge programs. However, they pointed out that the benefits of summer bridge programs may be diminished if institutions do not place students in courses based on high-stakes tests. Likewise, in their extensive review of the summer bridge program literature spanning two and a half decades, Ashley et al. (2017) reported significant findings. Notably, seven programs that set explicit goals to improve student GPAs reported considerable success compared to those not in the program, with five of these programs actively monitoring this progress. Additionally, while 13 programs did not specifically aim to enhance GPAs, they nonetheless regarded GPA as a crucial measure of student achievement. Consequently, out of 18 programs that tracked student GPAs, a remarkable 83% (15 programs) succeeded in improving the GPAs of their students.

Barnett et al. (2012), in their examination of the Texas Department of Higher Education Bridge Program, assessed eight bridge programs in Texas. They reported that participants in these programs showed a higher success rate in their initial college-level mathematics and writing courses compared to non-participants. However, the disparity between the two groups did not reach statistical significance after two years of observation. Wathington et al.'s (2016) findings are consistent with those of Barnett et al. (2012). Further, the results of Medina (2016) expand the debate, arguing that the evaluation study failed to indicate a definitive positive effect of the summer bridge program on first-year

student academic performance. Further, as demonstrated by Campbell (2021), participants in the summer bridge program had lower GPAs than non-participants, indicating that the program did not meet the needs of high school students preparing for college.

Finally, a recent study conducted by Cross (2022) reported insightful findings, arguing no significant difference between college students participating in a bridge program and those who did not (non-bridge participants) on various academic measures. Nevertheless, non-bridge participants performed slightly better than bridge participants in areas such as GPA in their first semester and credit completion rates. Despite slightly higher academic performance for non-bridge participants, retention rates (continuing from fall to fall) were similar for both groups.

3.3.2.2 Foundation Program (United Kingdom & Europe)

Among nations that offer such programs, the UK hosts the greatest number of university pathway programs per educational institution (Agosti & Bernat, 2018). A variety of pathways are available in the UK. Some are directly administered by universities, while others are operated by private entities that have forged partnerships with specific universities, tailored to prepare students for admission into those institutions. According to the *World Education News and Reviews* in 2013, universities had recently been collaborating with private providers to establish international centres. These centres are strategically located either on or adjacent to university campuses, providing these preparatory programs with a wider scope and accessibility. Moreover, there are three main types of university preparation program: the Access to Higher Education Diploma; International Foundation Program; and University Foundation Program (World Education News and Reviews, 2013). An Access to Higher Education Diploma is a university pathway program offered in England and Wales for mature-age British residents returning to education. A number of such diplomas are also available to international students:

> International Foundation Programs cater solely for international students. Many of these programs are offered at British universities and guarantee direct entry into those universities upon successful completion. Some are linked to a specific bachelor program whereas others articulate into a range of programs or a number of universities (Agosti & Bernat, 2018, p.5)

The University Foundation Program, spanning a year, is designed to meet the needs of students lacking the necessary qualifications or specific knowledge for entry into higher education. These programs, open to both British residents and international students, lead to specific undergraduate or graduate degrees upon completion. It is common for these programs to function as the first year of a continuous four-year study program, or as the 'year zero' of a longer course like engineering or medicine (World Education News and Reviews, 2013).

Sanders and Daly (2013) investigated the impact of foundation year courses on students' later academic performance in higher education. Their findings showed that foundation graduates performed comparably to direct-entry students in their first year of degree programs, highlighting the foundation year's effectiveness in preparing students. O'Sullivan et al. (2018) demonstrated that foundation year programs at selective universities are effective in assisting students in their integration into university. In the same vein, Boliver et al. (2017) advocated for expanding such programs in England, especially for disadvantaged students. Jones et al. (2018) found that international students who attended an international foundation year program at a pathway college were better prepared for their first year in their degree program. Therefore, they argued that attending the international foundation year has a positive impact on the academic performance of international undergraduates.

In studies across Europe, Jansen and Suhre (2010) in the Netherlands found that pre-university study skill preparation, particularly in time management and learning skills, positively influenced first-year students' motivation, study behaviour, and academic achievement at a Dutch university's law department. This preparation also reduced academic stress, aligning with other studies that link effective time management and study skills to improved control over study behaviour. This indicates that pre-university study skills positively impact first-year achievement and progress. Greefrath et al. (2017) conducted an analysis in Germany, focussing on the effects of classroom-based and e-learning preparatory courses at the University of Kassel, specifically in the electrical engineering and computer science fields. Their findings indicate that while such courses yield significant short-term mathematical success, their influence on long-term academic achievement remains ambiguous. Nonetheless, an improvement in students' mathematical performance post-course participation was noted. Corroborating these

findings, Büchele (2020) observed similar outcomes. Additionally, Fischer (2014) reported notable variance in mathematical competence following preparatory courses, with e-courses demonstrating particularly improved results.

3.3.2.3 Pathway Program (Australia)

In Australia, the term 'pathway college' is used to refer to partnerships between universities and (generally) private, for-profit colleges that offer diploma programs as a 'pathway' into second-year university programs (Bode, 2013; Fiocco, 2006). Pathway colleges are not strongly defined, and their use varies widely (Bode, 2013; McKay et al., 2018). This concept also includes pathways between public institutions like Technical and Further Education (TAFE) and universities, catering to students who have not met direct university entry requirements, whether in English proficiency or academic qualifications (Bode, 2013).

Essentially, a pathway program is intended to facilitate the transition from secondary school to higher education (Adams et al., 2009). Students have been joining universities via alternative pathways as part of the Australian government's commitment to widening participation and ensuring university education is accessible to everyone (Bradley et al., 2008). Studies by Hodges et al. (2013) and Vernon et al. (2019) illustrated how enabling courses have significantly increased university access for students from diverse backgrounds. As noted by Pitman et al. (2016), these groups include indigenous populations, individuals from low socioeconomic backgrounds, refugees, students with disabilities and the first generation. In these programs, students can pursue higher education without having to fulfil academic prerequisites for direct entry into university courses, as emphasised by Baik et al. (2019):

> According to Fiocco (2006), the successful development of pathway programs has been made possible through the national accrediting system of the Australian Qualifications Framework (AQF). Private providers develop courses mainly designed for international fee-paying students within this framework, and upon successful completion, the pathway courses provide both international and local students direct articulation to higher education. In most cases the provider offers a Certificate IV (an alternative to the end of high school exams, such as Tertiary Entrance Exams, 'A' levels and the International Baccalaureate) in a number of

> popular streams, for example, Commerce, Media and Communication, Information Technology and Design. The Certificate leads to a Diploma which is the equivalent of the first year of a university course. In many cases the private provider has an agreement to use a university's intellectual property, for which the university is paid a royalty. In turn the university agrees to moderate assignments and exams and grants advanced standing of one year for the Diploma. (p. 1)

Additionally, in aggregate, these alternative entry pathways offer non-traditional students a 'second chance' to obtain a higher education (Diamond & O'Brien-Malone, 2018). Diamond and O'Brien-Malone (2018) expressed concern that inadequately prepared students have been allowed to attend university, potentially resulting in poor academic outcomes, increased pressure on university teaching resources and academics feeling pressured to pass weaker students, which may negatively affect the perceived value of degree education.

The Diploma of Foundation Studies (DoFS) is another pre-program or (pathway) in Australia that is mostly focussed on international students and local (Leask et al., 2003; Levy & Murray, 2005):

> Universities in Australia provide direct entry to international graduates from a range of Foundation programs. Many of these programs include specific English language development units or modules and/or use English as the language of instruction. Successful completion of these programs usually negates the need for an international student to have to sit for a language test to satisfy English language entry criteria. Some universities provide these Foundation programs themselves, others have agreements with other providers to deliver them. A range of Foundation programs, offered both in Australia and overseas, are recognised by Australian universities as an English language entry and academic skills pathway to tertiary study (Leask et al., 2003, p. 19).

The DoFS program at Monash University was examined by Levy and Murray (2005). The program was designed for recent school leavers, and TAFE students whose performance in Year 12 did not qualify them for mainstream entry into Monash University. Its objective is to provide students with the academic skills and tertiary literacy necessary to progress to a full degree program. Based on the findings of Levy and

Murray (2005), the DoFS is particularly valuable for students with low entrance scores. Moreover, the innovative teaching methods used in this program have been instrumental in assisting students who might otherwise face academic difficulties. The results of this study suggest that tailored support programs such as the DoFS can effectively assist students with lower scores in achieving success in higher education. Similarly, Fiocco (2006) discovered negligible differences in the academic outcomes between diploma and direct-entry students in their second program year. She determined that the semester weighted-average mark (WAM) for pathway students in the Bachelor of Commerce program at the partner institution was 56.69, which was not significantly different from the semester WAM for direct-entry students, at 57.91.

Chesters and Watson (2016) illustrated that ATAR contributes significantly to the prediction of the conditional mean of first-year WAM for both Year 12 and the entry pathway, but that the two groups differed in several important ways. The entry pathway had a significant impact on the conditional distribution of first-year marks. Students who entered university from secondary school (Year 12 entry) were more likely to achieve outstanding performance than those who entered from the entry pathway. The researchers concluded that the provision of enabling programs on campus can facilitate the successful completion of university degrees by students who do not meet minimum entrance requirements. Bode (2013) analysed differences between pathway and direct-entry students in their first year of university and their performance in the second year, finding no significant difference in pass and retention rates over three years among the groups. Moreover, Lisciandro (2022) conducted a study of Murdoch University's On-Track pathway and compared it to first-year retention and academic outcomes among students who entered the university between 2014 and 2016. The study revealed that despite their lower academic performance, On-Track-pathway students were retained at comparable or higher rates than all other admission pathways. Additionally, multivariate regression analysis revealed that admission pathway, demographics and enrolment factors explained little of the observed variation in outcomes for first year and all students, and were particularly poor predictors of academic underperformance among first-year students.

In Australia, it is notable that preparation programs are offered through community colleges and public institutions, including TAFE and institutes of technology and polytechnics, as mentioned by Hodges et al. (2013) and Millman and McNamara (2018).

These programs vary in their duration, content and delivery methods, as detailed by Pitman et al. (2016).

3.3.2.4 Preparatory Programs in Other Countries

In Chile, pre-college outreach programs, including educational programs, have become more important in recent years (Venegas-Muggli, 2019). These programs, a collaboration between universities, non-government organisations and the Ministry of Education (Figueroa et al., 2015), target underrepresented students, offering academic and non-academic courses to prepare them for higher education. High-achieving students may also receive special university placements, with continued support throughout their post-secondary education. Therefore, Venegas-Muggli (2019) examined the impact of an outreach program in Chile aimed at improving students' language and mathematics aptitude, as well as developing their soft skills. It was found that students who participated in this program were more likely to achieve higher GPAs and attendance levels in college than those who did not take part. Additionally, Venegas-Muggli et al. (2021) corroborated these findings, noting significant improvements in GPA, retention rates and attendance among students engaged in peer mentoring, further substantiating the positive impact of pre-college programs.

In Qatar, the Foundation Program has been in existence since 2003, and focusses on English, mathematics and communications technology skills (Al-Hendawi et al., 2018; Nasser, 2012). Its objective is to improve university standards and increase access to post-secondary education for Qatari citizens. Nasser (2012) evaluated the impact of foundation-year courses at a Qatari public university, focussing on mathematics and English skill development. The study revealed that higher-level foundation courses were associated with better academic performance overall. Nevertheless, in mathematics, while higher foundation levels improved performance in business mathematics, this was not consistently the case for calculus.

3.4 The Impact of English Language Proficiency on Academic Performance

With the spread of globalisation in higher education, EMI programs have increased, affirming English's dominant status as the lingua franca of global academia. EMI, as

defined by Macaro et al. (2018), entails the use of English to teach in regions where English is not the majority's first language. Although EMI is becoming increasingly prevalent, its implementation remains a challenge. This is evidenced by numerous studies, such as that of Zhou and Thompson (2023), who thoroughly examined the challenges students face in adapting to the EMI context.

The impact of English language proficiency is an issue of interest for many countries around the world where English is not the primary language. Various studies have focussed on assessing the impact of English language proficiency on students from non-English speaking backgrounds. Each study examined a variety of variables to determine if they were correlated with academic performance. When assessing the impact of English language proficiency on student performance, most research has relied on either the IELTS (e.g., Aizawa, 2023; Dang & Dang, 2023; Dooey & Oliver, 2002; Feast, 2002; Kerstjens & Nery, 2000; Neumann et al., 2019; Schoepp & Garinger, 2016; Yen & Kuzma, 2009) or TOEFL (e.g., Cho & Bridgeman, 2012; Ginther & Yan, 2018; Krausz et al., 2005; Wait & Gressel, 2009; Wongtrirat, 2010), and in some cases both (e.g., Arcuino, 2013; Hill et al., 1999; Johnson & Tweedie, 2021; Woodrow, 2006), reflecting the country context and methodology of each study.

Therefore, this literature review methodically examines a range of studies focussed on academic success in ESL and EFL students. It further delves into research concerning the role of the IELTS and TOEFL in predicting academic achievement. Additionally, the review addresses studies in the accounting discipline and compares MC with LC subjects, providing insights into the varying impacts on academic performance in this area. A summary of research findings is provided in Table 3.3.

Table 3.3 Summary of findings on the impact of English language proficiency on academic performance

Authors	Country	Explanatory variables	Dependent variables	Findings	Level of significance
Light et al. (1987)	USA	TOEFL	GPA & graduate credit earned	A significant correlation between TOEFL score & GPA among humanities, fine arts & social science students but no significant correlation between TOEFL score & GPA among science, maths & business students.	Weak
Johnson (1988)	USA	TOEFL	GPA	Moderate correlation between overall TOEFL score & mean grade point average.	Moderate
Cotton & Conrow (1998)	Australia	IELTS	GPA, academic staff ratings of student performance & students' self-rating of performance	No overall positive correlation between IELTS score & academic outcomes. However, reading & writing sub-test scores correlated positively with staff ratings of academic achievement & student self-estimates of academic performance in the 2nd semester.	No
Hill et al. (1999)	Australia	IELTS *v.* TOEFL	1st semester GPA	Moderately strong correlation between GPA & IELTS score but relatively weak correlation between achievement & TOEFL score.	Moderate
Dooey & Oliver (2002)	Australia	IELTS	SGPA	Weak correlation between IELTS score & student academic performance in schools of business, science & engineering. IELTS score could explain only a small proportion of variation in academic performance among students.	Weak
Feast (2002)	Australia	IELTS	GPA	Significant, positive relationship between IELTS test score & university performance, indicating that students with higher IELTS scores tend to have better academic performance.	Weak
Krausz et al. (2005)	USA	TOEFL	Financial accounting course marks	TOEFL score was not associated with superior performance in graduate-level accounting for international students.	No
Woodrow (2006)	Australia	TOEFL & IELTS	FSGPA	Statistically significant but weak positive relationship between IELTS & academic achievement among international students—particularly those from non-English-speaking backgrounds—but no significant correlation between TOEFL & academic performance.	Weak

Authors	Country	Explanatory variables	Dependent variables	Findings	Level of significance
Maleki & Zangani (2007)	Iran	IELTS	GPA	Notable link between English language proficiency & GPA, indicating that students with higher language proficiency tend to achieve higher grades. Significant correlation between English language proficiency & success in English speaking & writing subjects.	Sig
Yen & Kuzma (2009)	UK	IELTS	1st semester GPA & 2nd semester GPA	Chinese students' academic performance in the 1st semester was positively correlated with their IELTS score. The relationship in the 2nd semester was weaker but still significant.	Sig
Wait & Gressel (2009)	USA	TOEFL	GPA	Correlation between TOEFL score & GPA that was deemed statistically significant & positive. However, the correlation was weaker for engineering students compared to students in other fields, & for engineering compared with non-engineering courses.	Weak
Wongtrirat (2010)	USA	TOEFL	GPA & course completion	Weak correlation between TOEFL score & GPA, as well as course completion.	Weak
Avdi (2011)	Australia	IELTS	GPA	Relatively weak link between English language proficiency & academic performance of international students enrolled in a Master of Public Health program in Australia.	Weak
Cho & Bridgeman (2012)	USA	TOEFL	GPA	The relationship between TOEFL score & GPA not particularly strong. However, expectancy graphs showed that students with higher TOEFL scores tended to earn higher GPAs. The researchers concluded that even though the correlation was weak, it was still meaningful, & TOEFL provided valuable information about the academic performance of non-native-English students beyond what other admission tests could provide.	Weak
Oliver et al. (2012)	Australia	IELTS	WAM	In the undergraduate group, the only notable correlation was observed between the reading sub-test score & WAM, but even this correlation was considered weak. However, in the postgraduate cohort, a weak but still significant correlation was identified between reading sub-test score & WAM, as well as between the overall test score & WAM. Further, there was a very weak yet significant	Weak

Authors	Country	Explanatory variables	Dependent variables	Findings	Level of significance
				correlation between listening & WAM, as well as speaking & WAM.	
Garinger & Schoepp (2013)	UAE	IELTS	GPA	Significant positive relationship between IELTS score & GPA, which suggests that higher IELTS scores are associated with higher academic success. However, the article also noted that the relationship was not very strong, indicating that other factors, such as motivation, effort & prior educational background may also play a significant role in academic success.	Weak
Arcuino (2013)	USA	TOEFL & IELTS	GPA	TOEFL & IELTS scores statistically significantly correlated with final cumulative GPA among international students. No significant difference in academic performance between TOEFL & IELTS scores.	Sig
Al-Malki (2014)	Oman	IELTS	GPA	Moderate significant relationship between IELTS score & GPA.	Moderate
Dev & Qiqieh (2016)	UAE	IELTS	GPA	No significant association between language proficiency (IELTS score) & GPA.	No
Schoepp & Garinger (2016)	UAE	IELTS	GPA	Students who achieved an IELTS score of 7.0 had consistently displayed superior academic performance compared with direct-entry students. This suggests that an IELTS score of 7.0 could serve as a significant benchmark for academic achievement	Sig
Schoepp (2018)	UAE	IELTS	GPA	IELTS score is a meaningful predictor of academic success, especially in the EMI environment in the UAE. The higher an IELTS-entry score, the higher the GPA. An IELTS score of 6.0 or higher is a key benchmark that predicts academic success. This score may be a better fit for non-English-speaking countries, as it is lower than the IELTS guidelines.	Sig
Ginther & Yan (2018)	USA	TOEFL	Chinese students' FYGPA	In the 2011 & 2012 cohorts, there were positive correlations between speaking & writing subscale scores & GPA, while negative correlations were observed for listening & reading. However, for the	Weak

Authors	Country	Explanatory variables	Dependent variables	Findings	Level of significance
				2013 cohort, writing, reading & total subscale scores were positively correlated with GPA & the negative correlations disappeared.	
Neumann et al. (2019)	Canada	IELTS	GPA	Language ability impacted academic success during the 1st year in a business program.	Sig
Yang & Farley (2019)	Australia	ENL (Australian), ESL (Malaysian), & EFL (Chinese) students groups	MC *v*. LC accounting subjects (marks, ranks & ratios)	EFL (Chinese) students performed 26.5% worse on MC than LC subject rankings, even after considering academic ability & other student-specific factors. Although the Chinese secondary education system places greater emphasis on mathematical skills, there was still a significant decline in performance due to language barriers. In contrast, there was only a small difference in performance between ESL (Malaysian) & ENL (domestic) student cohorts, suggesting that language has a minimal impact on ESL students compared to EFL students. Both ESL & EFL students had difficulty with more conceptual subjects.	No
Farley et al. (2020)	Australia & China	Chinese national college English language program (CEP), a Western university's English for academic purpose (EAP) language program & a standardised English language proficiency	Average mark in business diploma subjects & average mark in 2nd & 3rd year for all business subjects	Both CEP & EAP were significant predictors of performance in the 1st-year pathway diploma program but neither added any predictive power to the later-year degree subjects beyond performance in the diploma program. There was also a weak connection between SELP & both CEP & EAP. Every student who failed the SELP test but had passed the diploma, CEP & EAP programs completed their degrees successfully. Therefore, the study raises concerns regarding English-speaking universities' use of SELP alone as the admission criterion.	Weak

Authors	Country	Explanatory variables	Dependent variables	Findings	Level of significance
		(SELP) test for each student			
King et al. (2021)	Australia	L1 *v*. L2 students	Essay (MC) *v*. application (LC) marks in the same exam of an intermediate financial accounting study unit	No difference between students with an English language background & students with a non-English language background in performance level in questions requiring calculations (LC). In contrast, students with an English language background performed better in essay questions (MC).	No
Dang & Dang (2023)	UK	IELTS	GPA	Consistently significant correlations between participants' IELTS score & their GPA, with a medium correlation between overall IELTS score & GPA. While all IELTS sub-skills were significantly correlated with GPA, none of the correlations were particularly strong, with reading showing the strongest correlation.	Medium
Johnson & Tweedie (2021)	Canada	IELTS & TOEFL along with EAP programming	GPA	All standardised tests measuring English language proficiency for admission preparation (including IELTS & TOEFL) were insignificant &/or problematically weak predictors of achievement during both the 1st & final semesters of study. Conversely, completion of pre-enrolment EAP programming was significantly associated with academic achievement.	No
Aizawa (2023)	Japan	IELTS	Pre-& post-content tests	English proficiency alone is not sufficient for a successful transition into EMI programs. This emphasises the importance of considering a variety of factors other than language proficiency when facilitating successful transition for students in EMI environments.	No

3.4.1 Evaluating the Impact of English Language Ability as Measured by the IELTS and the TOEFL in the Context of English Medium Instruction

A focused discussion of the findings presented in Table 3.3 is integrated throughout this section to highlight both the variation in results and the broader academic debate surrounding the role of English language proficiency in academic performance.

As standardised English language tests, such as IELTS and TOEFL, have been widely used to determine whether students from non-English backgrounds are capable of pursuing English-medium courses (Green, 2007), researchers have focussed a considerable amount of attention on their predictive validity. Studies examining the predictive validity of IELTS and TOEFL have been inconclusive. Among academics, debate over the influence of English language proficiency on academic performance is multifaceted and complex. A wide variety of research findings contribute to this ongoing discussion across the world. Studies have found significant correlations between English proficiency and academic performance (Arcuino, 2013; Maleki & Zangani, 2007; Neumann et al., 2019; Schoepp, 2018; Schoepp & Garinger, 2016; Yen & Kuzma, 2009). Conversely, other research has positioned English proficiency as a moderating factor rather than a direct contributor to academic performance (Al-Malki, 2014; Hill et al., 1999; Johnson, 1988). Adding to this debate is the fact that some studies have revealed only a weak correlation between English proficiency measured by standardised English language tests and academic performance (Avdi, 2011; Cho & Bridgeman, 2012; Dooey & Oliver, 2002; Farley et al., 2020; Feast, 2002; Garinger & Schoepp, 2013; Ginther & Yan, 2018; Hoefer & Gould, 2000; Oliver et al., 2012; Woodrow, 2006). However, other studies indicate the absence of a significant relationship, further contributing to the complexity of this academic debate (Aizawa, 2023; Dev & Qiqieh, 2016; Johnson & Tweedie, 2021; Krausz et al., 2005).

3.4.1.1 Studies in English-speaking Countries

As an extension on the studies summarised in Table 3.3, an early study by Light et al. (1987) in the USA revealed a significant correlation between TOEFL score and GPA among humanities, fine arts and social science students, but no significant correlation between TOEFL score and GPA among science, mathematics and business students. In contrast, Johnson (1988) claimed that among international students, there was a moderate

correlation between overall TOEFL score and mean GPA in mathematics, humanities and business. Other researchers (e.g., Cho & Bridgeman, 2012; Ginther & Yan, 2018; Wait & Gressel, 2009; Wongtrirat, 2010) reported a positive but weak correlation between English language proficiency measured by TOEFL and student performance measured by GPA in engineering, business, humanities, arts sciences and social sciences. Moreover, Krausz et al. (2005) illustrated that TOEFL score was not associated with superior performance in graduate-level accounting for international students. Likewise, Hoefer and Gould (2000) found no significant correlation between GPA and TOEFL score among graduate business college students. As summarized in Table 3.3, these early studies in the U.S. reveal mixed results, with TOEFL showing stronger correlations in certain fields (e.g., humanities) but weaker or no predictive power in others, such as business and science.

In Australia, studies have shown that a low level of English language proficiency for international students in Australian universities has a significant impact on their academic performance (Benzie, 2010; Birrell, 2006; Ryan et al., 2012). Additionally, Feast (2002) and Kerstjens and Nery (2000) investigated the relationship between English language ability and academic performance. IELTS results were used to measure language ability, while GPA was used to measure academic performance at university. The researchers reported a weak but significant positive relationship among variables. These findings appear to be in line with those of a study undertaken by University of Melbourne researchers, who found a moderate association between students' GPA and IELTS scores (Hill et al., 1999). Additionally, Dooey and Oliver (2002) claimed that there was a weak correlation between IELTS score and students' academic performance in schools of business, science, and engineering. The authors also found that IELTS scores could explain only a small proportion of the variation in academic performance among students. Avdi (2011) and Oliver et al. (2012) found a weak correlation as well. Taken together, the pattern reflected in Table 3.3, when compared across multiple Australian studies, demonstrates that IELTS tends to have weak-moderate correlations with academic achievement, depending on the discipline and type of assessment.

Farley et al. (2020) investigated the predictive power of Chinese national College English Language Programs (CEP), English for Academic Purposes (EAP) language programs at Western universities and Standardised English Language Proficiency (SELP) tests for

Chinese students in transnational business degree programs. An analysis of the academic results of 759 Chinese students studying in these programs between 2006 and 2014 was conducted. The researchers found that both CEP and EAP were significant predictors of performance in the first-year pathway diploma program. However, neither added any predictive power to the later-year degree subjects beyond performance in the diploma program. Further, a weak connection existed between SELP and both the CEP and EAP. According to this study, every student who failed the SELP test, but had passed the diploma, CEP and EAP program, completed their degree successfully. Therefore, the study raises concerns regarding English-speaking universities' use of SELP alone as the admission criterion. Woodrow (2006) investigated the predictive validity of education postgraduate coursework students' English proficiency as measured by IELTS at the University of Sydney, finding a weak but significant positive relationship between IELTS and academic achievement among international students, particularly those from non-English speaking backgrounds.

Neumann et al. (2019) conducted a study in Canada and found that language ability measured by IELTS impacted academic success during the first year in a business program. Johnson and Tweedie (2021) investigated the impact of IELTS and TOEFL along with EAP programming on academic performance measured by GPA, and claimed that all standardised tests measuring English language proficiency for admission (including IELTS & TOEFL) were insignificant and/or problematically weak predictors of achievement during both the first and final semesters of study. Conversely, completion of pre-enrolment EAP programming was significantly associated with academic achievement.

In the UK, Yen and Kuzma (2009) found that Chinese students' academic performance in the first semester was positively correlated with their IELTS scores, but the relationship between IELTS and academic performance in the second semester was weaker (although still significant). In contrast, Dang and Dang (2023) demonstrated consistently significant correlations between participants' IELTS scores and their GPA, with a medium correlation between overall IELTS score and GPA. While all IELTS sub-skills were significantly correlated with GPA, none of the correlations were particularly strong, with reading showing the strongest correlation. As shown in Table 3.3, UK-based studies

report medium correlations between IELTS scores and GPA, although the strength varies across semesters and specific language skills, particularly reading.

Some studies (e.g., King et al., 2021; Yang & Farley, 2019; Yang & Silver, 2011) have shed light on the impact of English language proficiency in MC versus LC tasks in EMI in the discipline of accounting. First, Yang and Silver (2011) reported Australian academics' assessment of Chinese students' English language ability in EMI courses, which showed that comprehension of English was strong in LC subjects like economics, statistics, management accounting and computerised accounting systems, but that students had more problems in MC subjects such as law and accounting theory. Second, Yang and Farley (2019) demonstrated empirically that relative performance was affected according to language group: English as a Native Language (ENL), ESL or EFL. The results showed that both ESL and EFL students had difficulty with MC subjects. Last, King et al. (2021) investigated the influence of language background on performance in essays (MC) compared with calculations requiring application of accounting standards (LC). The researchers collected data for 2,850 students with different language backgrounds in a postgraduate accounting course taught in English. They found no difference between students with an English language background and students with a non-English language background in performance level for questions requiring calculations (LC). In contrast, students with an English language background performed better in essay questions (MC). The findings of King et al. (2021) and Yang and Farley (2019) support the usefulness of cognitive load theory (CLT) in explaining the extraneous load caused by the stress of additional mental translation for students with a language background other than English.

3.4.1.2 Studies in non-English-speaking Countries

In addition to the literature mentioned above, studies have been conducted in non-English-speaking countries. For instance, in Iran, Maleki and Zangani (2007) found a notable link between IELTS and GPA, indicating that students with higher language proficiency tended to achieve higher grades. Conversely, debate has arisen as a result of studies conducted in the United Arab Emirates (UAE). Garinger and Schoepp (2013) discovered a significant, yet weak positive relationship between IELTS score and GPA. This suggests that higher IELTS scores are associated with higher academic performance, but that other factors such as motivation, effort and prior educational background may

also play a significant role. Similarly, Dev and Qiqieh (2016) examined the relationship between English language proficiency (measured by IELTS), self-esteem and academic performance at Abu Dhabi University. They concluded that English proficiency had no direct impact on Abu Dhabi University students' self-esteem scores and academic performance. Additionally, Schoepp and Garinger (2016) demonstrated that students who achieved an IELTS score of 7.0 consistently displayed superior academic performance compared to direct-entry students, suggesting that an IELTS score of 7.0 could be a significant benchmark for academic achievement. Further, Schoepp (2018) argued that IELTS score is a meaningful predictor of academic performance, especially in the EMI environment in the UAE, with a score of 6.0 or higher being a key benchmark. Meanwhile, Al-Malki (2014) revealed a moderate significant relationship between IELTS score and GPA in Oman. Conversely, the most recent study conducted by Aizawa (2023) in Japan claimed that English proficiency, measured by IELTS alone, is not sufficient for a successful transition into EMI programs. These findings emphasise the importance of considering a variety of factors other than language proficiency to facilitate successful transition for students in EMI environments. As noted in Table 3.3, the findings from non-English-speaking countries, particularly the UAE, Oman, and Japan, demonstrate that English language proficiency varies not only by region, but also by institutional context and benchmark scores used for admission.

3.5 Review of Studies in Saudi Arabia

As this research focusses on a specific higher education institution in Saudi Arabia, it is essential to review relevant literature on admission criteria in the Saudi Arabian context. Having reviewed studies around the world, it is evident that the Saudi context is unique. Notably, it is one of the few countries that employs three main admission criteria: HSGPA, GAT and AT. Moreover, the unique Saudi institutional system related to gender—where male and female students are taught separately in high school and university (Almulhim, 2021; Alnahdi & Schwab, 2023; Barry, 2019)—adds another layer of complexity to the multiple admission criteria. Additionally, the admission criteria requirements differ between genders. Hence, it is crucial to take gender into account when exploring variation in academic performance, as done in previous studies in the Saudi context. Further, the PYP is part of the admission path and is mandatory for all students.

Therefore, it is essential to review the literature investigating the PYP and highlighting its potential contribution to academic performance.

A strategic move in the higher education sector in Saudi Arabia, aligned with Saudi Arabia's Vision 2030, has been to shift the medium of instruction from Arabic to English at all levels in higher education institutions. Therefore, it is important to review Saudi scholarly works related to the impact of English language proficiency, measured by IELTS, on relative academic performance. In this regard, the following discussion is devoted to the above aspects relevant to Saudi context studies (see Table 3.4 for a summary of these studies).

Table 3.4: Summary of research analysing admission criteria in Saudi Arabia

Authors	Explanatory variables	Dependent variables	Gender	Sample*	Theory	Model	Findings
Alshumrani (2007)	HSGPA & GAT	FYGPA	Male	Multiple dis/one uni	No	Multiple regression	Both HSGPA & GAT predicted success; HSGPA was slightly better, but GAT remained a valid criterion.
Al-Alwan (2009)	HSGPA, GAT & AT	FYGPA	Male	One dis (health sciences)/one uni	No	Univariate	AT correlated most strongly, followed by HSGA & GAT in predicting academic performance.
Al Rukban et al. (2010)	HSGPA, GAT & AT	Overall GPA	Ignored	One dis (health sciences)/one uni	No	Multiple regression	Only AT was statistically significant in predicting academic performance.
Albishri et al. (2012)	HSGPA, AT GAT/ (performance in maths & English at high school)	Overall GPA	Ignored	One dis (health sciences)/one uni	No	Univariate/ multiple regression	All variables were significant predictors, except maths in high school.
Murshid (2013)	HSGPA, GAT & AT	Overall GPA for each semester across degree	Ignored	One dis (health sciences)/one uni	No	Univariate/ multiple regression	HSGPA & AT were significant predictors, but GAT was not significant.
Al Alwan et al. (2013)	HSGPA, GAT & AT	Overall GPA over 3 years	Male	Two dis (health sciences & medical)/ one uni	No	Univariate/ multiple regression	All variables were significant predictors, but HSGPA was the strongest.
Al-Anazi (2014)	HSGPA & GAT	FYGPA	Male	Multiple dis/one uni	No	Multiple regression	HSGPA & GAT were all predictors of FYGPA.
Alghamdi & Al-Hattami (2014)	HSGPA, GAT & AT	Overall GPA	Male & female	Multiple dis/one uni	No	Multiple/ logistic regression	HSGPA & AT were significant predictors, but GAT was not significant. Females outperformed males.

Authors	Explanatory variables	Dependent variables	Gender	Sample*	Theory	Model	Findings
Alnahdi (2015)	HSGPA, GAT & AT	FYGPA/overall GPA/graduation	Ignored	Multiple dis/one uni	No	Linear/ multivariate/ logistic	Although all variables were significant predictors, HSGPA was the strongest & GAT was the best predictor of graduation.
Alhadlaq et al. (2015)	HSGPA, GAT & AT	FYGPA/SYGPA	Ignored	Multiple dis (focussing on health dis)/one uni	No	Multivariate	HSGPA & AT effectively predicted academic performance, while GAT did not significantly contribute.
Hassan & Al-Razgan (2016)	HSGPA, GAT & AT	FYGPA/overall GPA	Female	One dis/one uni	No	Multivariate	CGPA was affected more by HSGPA but GAT & AT were not associated with CGPA.
Sulphey et al. (2018)	HSGPA & GAT	Overall GPA	Ignored	One dis/one uni	No	ANOVA/ multivariate	Both HSGPA & GAT were significant predictors of Saudi students' academic performance.
Al-Asali et al. (2018)	HSGPA, GAT & AT	PYPGPA in engineering	Male	One dis/one uni	No	Univariate	HSGPA strongly correlated with PYPGPA, English courses positively impacted college success, GAT correlated with PYP maths/physics scores, but AT was less crucial than HSGPA & GAT.
Althewini (2019)	GAT, AT & English proficiency	Biology marks	Male	One dis/one uni	No	Multivariate/ multivariate regression	GAT & AT were significant predictors, but the variance was low.
Al-Qahtani & Alanzi (2018)	HSGPA,GAT & AT	Overall GPA over 3 years	Ignored	Multiple dis/one uni	No	Univariate	In both health & non-health colleges, HSGPA was the best predictor of annual GPA, followed by AT. However, GAT was not a significant predictor of GPA.
Althewini & Alkushi (2020)	HSGPA,GAT & AT	1st year English course marks	Ignored	One dis/one uni	No	t-test & multivariate	GAT was more predictive of English performance than was AT, whereas HSGPA had no significant correlation with English performance.

Authors	Explanatory variables	Dependent variables	Gender	Sample*	Theory	Model	Findings
Alshammari (2020)	HSGPA,GAT, & AT	Overall GPA	Male & female	One dis/one uni	No	Univariate/ multivariate	HSGPA was the best among the admission criteria, followed by GAT & AT respectively. Females did better than males.
Abdelfattah et al. (2022)	HSGPA,GAT & AT	GPA from PYP to graduation	Male & female	One dis/one uni	No	Univariate	HSGPA, GAT & AT correlated with PYPGPA, but not overall GPA. Female students performed better than males.
El-Moussa et al. (2021)	HSGPA & GAT	Overall GPA	Male & female	Multiple dis/one uni	No	ANOVA/ multivariate	In a Saudi Arabian university following a USA curriculum, neither HSGPA nor GAT predicted academic success, & females outperformed males.
Alamoudi et al. (2021)	GAT, AT & PYPGPA	Clinical biochemistry & clinical pharmacology exam marks	Female	Multiple dis (focussing on health dis)/one uni	No	ANOVA	AT weakly correlated with clinical biochemistry achievement but not with PYP scores. Admission exam scores did not significantly predict achievement in clinical biochemistry or clinical pharmacology; however, the latter's exam results did correlate with clinical biochemistry results.
Alhurishi et al. (2021)	HSGPA,GAT & AT	Overall GPA	Ignored	Multiple dis (focussing on health dis)/one uni	No	Univariate/ multivariate	All admission criteria significantly predicted overall GPA, with HSGPA being the most predictive for allied healthcare professions, followed by ACT & GAT.
Vista & Alkhadim (2022)	HSGPA,GAT & AT	PYPGPA/overall GPA/graduation (0,1)	Ignored	Multiple dis/multiple uni	No	Multilevel structural equation modelling	Both HSGPA & standardised tests were predictive of university performance.
Qahmash et al. (2023)	HSGPA,GAT & AT	Overall GPA	Ignored	One dis/one uni	No	Univariate	HSGPA, GAT & AT significantly correlated with GPA.
Alblowi (2016)	HSGPA, GAT & AT	PYPGPA in (health & natural sciences)	Ignored	Multiple dis/one uni	No	Univariate/ ANOVA	Significant correlation found between AT, HSGPA & GAT with PYPGPA, with AT

Authors	Explanatory variables	Dependent variables	Gender	Sample*	Theory	Model	Findings
							being the strongest criterion, followed by HSGPA & GAT.
Khoshaim et al. (2018)	Two maths courses marks in PYP	Maths course marks in 1st year	Ignored	Multiple dis/one uni	No	ANOVA	The grade earned in PYP maths courses correlated with the grade earned in the first college-level maths course.
Yushau & Omar (2007)	Math (1&2) 1st semester of PYP & English (1&2) 2nd semester of PYP measured by marks	Calculus I marks	Male	Multiple dis (maths & computer)/one uni		Multivariate regression	Success in Calculus I was influenced by the two PYP maths courses, their interaction & English at PYP.
Al-Amri & Awaji (2023)	English language course scores in 1st semester of PYP	Maths scores in 2nd semester in PYP	Male & female	Multiple dis/one uni		Pearson	There was a correlation between English proficiency & maths performance at PYP.
Dabaliz et al. (2017)	HSGPA,GAT, AT, IELTS & TOEFL	Overall GPA	Ignored	One dis (medical)/one uni	No	Multivariate regression	Only AT & TOEFL predicted pre-clinical year performance. GAT was negatively correlated with GPA, HSGPA & IELTS & did not predict pre-clinical GPA. None of the five pre-admission variables predicted clinical year GPA.

3.5.1 Variables Used to Measure Academic Performance

Saudi studies have used different measures of academic performance including the PYPGPA, individual courses marks, FYGPA, second-year GPA (SYGPA), overall GPA and graduation. Some Saudi researchers (Alshumrani, 2007; Al-Alwan, 2009; Al-Anazi, 2014) used FYGPA to measure the academic performance of students, while others (Al Alwan et al., 2013; Al-Qahtani & Alanzi, 2018; Al Rukban et al., 2010; Albishri et al., 2012; Alghamdi & Al-Hattami, 2014; Alhurishi et al., 2021; Alshammari, 2020; Dabaliz et al., 2017; El-Moussa et al., 2021; Qahmash et al., 2023; Sulphey et al., 2018) used overall GPA at the end of the third year and completion of a degree to measure academic performance. Additionally, Alblowi (2016) and Al-Asali et al. (2018) used PYPGPA to measure academic performance.

Some Saudi studies used more than one variable to measure academic performance. For example, Alhadlaq et al. (2015) used FYGPA and SYGPA as dependent variables to measure academic performance, while Hassan and Al-Razgan (2016) used FYGPA and overall GPA at the end of the degree. Murshid (2013) used overall GPA for each semester across the degree, while Alnahdi (2015) conducted studies using FYGPA, overall GPA and graduation as dependent variables. Abdelfattah et al. (2022) and Vista and Alkhadim (2022) used PYPGPA, overall GPA and graduation when predicting academic performance.

Regarding individual marks as a measure of academic performance, Althewini (2019) and Althewini and Alkushi (2020) used one final mark in biology and the first-year English course, respectively. In contrast, Alamoudi et al. (2021) conducted a study using two individual course marks: clinical biochemistry and clinical pharmacology exam marks. Overall, these studies highlight the various measures used in assessing academic performance among students in the Saudi Arabian context.

3.5.2 Factors Explaining Academic Performance in Saudi Studies

Studies based in Saudi Arabia have explored HSGPA, GAT and AT as explanatory variables for predicting Saudi students' academic performance. A significant number of studies has investigated three explanatory variables as measures in predicting academic performance: HSGPA, GAT and AT (Al Alwan, 2009; Al Rukban et al., 2010; Albishri et al., 2012; Al Alwan et al., 2013; Alghamdi & Al-Hattami, 2014; Alnahdi, 2015;

Alhadlaq et al., 2015; Alblowi, 2016; Dabaliz et al., 2017; Hassan & Al-Razgan, 2016; Al-Asali et al., 2018; Al-Qahtani & Alanzi, 2018; Althewini & Alkushi, 2020; Alshammari, 2020; Abdelfattah et al., 2022; Alhurishi et al., 2021; Murshid, 2013; Qahmash et al., 2023; Vista & Alkhadim, 2022). These studies have revealed that all three admission criteria are significant predictors of academic performance. However, the key difference in findings among studies is in the predictive power of each of the three variables. For instance, Al Alwan (2009) found AT had the strongest correlation with FYGPA, while others (Al-Alwan et al., 2013; Alshammari, 2020; Alhurishi et al., 2021) found HSGPA was the best predictor among the explanatory variables of overall GPA. Alnahdi (2015) demonstrated that although HSGPA was the best predictor of academic performance, GAT was better at predicting graduation.

In contrast, Murshid (2013), Alghamdi and Al-Hattami (2014), Al-Qahtani and Alanzi (2018) reported that GAT was not significant in predicting overall GPA. Likewise, Alhadlaq et al. (2015) demonstrated that GAT was not significant in the prediction process. Al-Asali et al. (2018) found that AT was weak in predicting PYPGPA in engineering, and Althewini and Alkushi (2020) reported that HSGPA was not significant in predicting first-year English course marks. Other studies have that found two of the three explanatory variables were not significant in predicting academic performance. For example, Al Rukban et al. (2010) showed that HSGPA and GAT were not statistically significant in predicting overall GPA, and Hassan and Al-Razgan (2016) showed that GAT and AT were not associated with overall GPA in computer and information science. In addition, Althewini (2019) and Alamoudi et al. (2021) showed that the variance in GAT and AT was low in predicting individual course marks. Abdelfattah et al. (2022) found no associations between the explanatory variables (HSGPA, GAT & AT) and overall GPA of engineering students.

In addition to the above studies, some Saudi-based studies, such as Alshumrani (2007), Al-Anazi (2014), Sulphey et al. (2018) and El-Moussa et al. (2021), have investigated two variables, HSGPA and GAT, as explanatory variables to predict academic performance. With the exception of El-Moussa et al. (2021), these studies revealed that HSGPA and GAT were good predictors of academic performance measured by FYGPA and overall GPA. Althewini (2019) and Alamoudi et al. (2021) examined GAT and AT

as explanatory variables to predict academic performance, measured by individual course marks. Both studies reported weak correlations with the explanatory variables.

3.5.3 Gender as a Variable Predicting Academic Performance

In Saudi Arabia, gender is a special issue because of religious and cultural influences (Almunajjed, 1997). The education system presents a unique situation where all students, teachers, workers and school leaders in a given educational institution are of the same gender (Almulhim, 2021; Alnahdi & Schwab, 2023; Barry, 2019; Mutambik et al., 2020). Even in a university, when students (male & female) have the same instructor, video conferencing is used without teachers and students ever meeting face to face (Mackey, 2002). In fact, Saudi Arabia's education system has a number of unique features when compared with other Middle Eastern countries (Kanalan & Celep, 2011) and the rest of the world (Shavinina, 2009). Gender is a selection criterion and requirements are different for males and females.

A review of Saudi studies indicates that the difference in academic performance between male and female students have been neglected. Only a limited number of studies have specifically examined male (Alshumrani, 2007; Al Alwan, 2009; Al Alwan et al., 2013; Al-Anazi, 2014; Al-Asali et al., 2018; Althewini, 2019) or female students (Alamoudi et al., 2021; Hassan & Al-Razgan, 2016). Most Saudi-based studies have not examined gender differences in academic performance (Al-Qahtani & Alanzi, 2018; Althewini & Alkushi, 2020; Alhurishi et al., 2021; Al Rukban et al., 2010; Albishri et al., 2012; Alnahdi, 2015; Alhadlaq et al., 2015; Alblowi, 2016; Dabaliz et al., 2017; Khoshaim et al., 2018; Murshid, 2013; Qahmash et al., 2023; Sulphey et al., 2018; Vista & Alkhadim, 2022).

Among the few studies that have explored differences in academic performance between genders (Alghamdi & Al-Hattami, 2014; Alshammari, 2020; Abdelfattah et al., 2022; El-Moussa et al., 2021), the results have consistently shown that females outperformed males in academic performance across all predictor variables, using mean comparison of academic performance between male and female students.

3.5.4 The Preparatory Year Program

A review of Saudi-based studies reveals that very few studies have investigated the PYP in predicting academic performance. With the exception of one study that involved the business discipline, these studies investigated the PYP as an explanatory variable in medicine (Alamoudi et al., 2021), engineering and computer science (Yushau & Omar, 2007) and across multiple disciplines (Al-Amri & Awaji, 2023; Khoshaim et al., 2018). The study by Khoshaim et al. (2018) involved multiple disciplines, one of which was the PYP related to business conducted at a private university in Riyadh (see Section. 2.6.1 for further details about differences in the PYP in the Saudi context). Khoshaim et al. (2018) showed that the marks in PYP mathematics courses correlated with the marks in the first college-level mathematics course.

The study by Alamoudi et al. (2021) found no correlation between PYPGPA specialised for medical students and academic performance in the basic science courses at KAU. In contrast, Yushau and Omar (2007) demonstrated that success in the Calculus I course at King Fahd University of Petroleum and Minerals was largely dependent on the two preparatory year mathematics courses as well as their interaction. Also, it was found that the English course in the PYP was a significant predictor of Calculus I performance. Similarly, Al-Amri and Awaji (2023) indicated that English language course scores from the PYP at Bisha University predicted subsequent mathematics performance in the second semester of the PYP.

In addition to using PYP as an independent variable, other studies have used PYP as a dependent variable in different fields of study, such as health and natural sciences (Alblowi, 2016), engineering (Al-Asali et al., 2018; Abdelfattah et al., 2022) and across multiple disciplines (Vista & Alkhadim, 2022). According to Alblowi (2016), there was a statistically significant correlation between HSGPA, GAT and AT, and PYPGPA, with AT being the strongest predictor. However, in engineering, Al-Asali et al. (2018) reported a strong correlation between HSGPA and GPA in the PYP. In addition, the analysis showed that English courses had a positive correlation with students' GPA and were crucial to a student's success at college. Also, GAT was correlated with PYP mathematics/physics scores. However, AT was less crucial than HSGPA and GAT. Similarly, Abdelfattah et al. (2022), and Vista and Alkhadim (2022) found a significant correlation between admission criteria and PYPGPA.

3.5.5 The Regression Model Used in Previous Saudi Studies

Numerous models have been used to analyse data in previous studies. Al Alwan (2009) and Al-Asali et al. (2018) used univariate data, running one explanatory variable at a time, while other studies (Alshumrani, 2007; Al Rukban et al., 2010; Al-Anazi, 2014; Alhadlaq et al., 2015; Dabaliz et al., 2017; Hassan & Al-Razgan, 2016; Yushau & Omar, 2007) utilised multivariate analysis where the whole set of explanatory variables was included in one regression. Some studies (Abdelfattah et al., 2022; Al Alwan et al., 2013; Albishri et al., 2012; Alhurishi et al., 2021; Alshammari, 2020; Althewini, 2019; Murshid, 2013) ran both a univariate and multivariate model, with the univariate model used to run each explanatory variable in sequence and the multivariate model to run the whole set of explanatory variables at once.

Other studies conducted ANOVA and multivariate analysis (e.g., El-Moussa et al., 2021; Sulphey et al., 2018), while Alamoudi et al. (2021) and Qahmash et al. (2023) used only ANOVA. Alghamdi and Al-Hattami (2014) and Alnahdi (2015), in contrast, utilised multivariate and logistic regression. In addition, Althewini and Alkushi (2020) used the t-test and multivariate regression. Finally, Vista and Alkhadim (2022) conducted multilevel structural equation modelling.

This wide array of analytical approaches reflects the diverse methods utilised by researchers in exploring relationships between explanatory variables and academic performance in the context of higher education institutions in Saudi Arabia. The choice of model depends on the specific research questions, data characteristics and complexity of interactions between variables. By considering and comparing the findings from different analytical methods, researchers can gain a more comprehensive understanding of factors influencing academic performance.

3.5.6 English Language Proficiency and Academic Performance

The challenge presented in Saudi Arabia higher education involves the transition from Arabic to English as the instructional language. According to Evans (2010), there is a growing demand for professionals to interact in English in non-English speaking countries. However, the impact of English language proficiency on the academic performance of Saudi students in the context of EMI is a matter of interest for many countries around the world where English is not the primary language.

A review of Saudi studies on the impact of English language proficiency measured by IELTS on academic performance reveals a significant gap. Notably, Dabaliz et al. (2017) was the only study that assessed English proficiency, measured by both IELTS and TOEFL, as independent variables in predicting the performance of undergraduate medical students in Saudi Arabia, by evaluating their overall GPA. The findings of Dabaliz et al. (2017) indicate that while TOEFL scores significantly predicted pre-clinical year performance, IELTS scores did not serve as a significant predictor of pre-clinical GPA. Additionally, the study found that neither IELTS nor TOEFL scores could predict students' overall GPA in clinical years. To the best of the author's knowledge, no study to date aside from Dabaliz et al. (2017) has evaluated the effectiveness of IELTS scores, used as the main admission criteria, in predicting the relative academic performance of Saudi students.

3.6 Summary

This chapter provided a comprehensive review of academic literature on the efficacy of current admission criteria and their evaluation methods in higher education. It discussed the predictive reliability of various standardised tests in predicting academic performance. Moreover, the chapter explored the PYP and its equivalent programs in a variety of national contexts. It further explored research related to English language proficiency and its influence on relative academic performance. It also offered insights into research concerning educational evaluation in Saudi Arabia. The chapter concluded by summarising research on Saudi Arabia's higher education system.

The next chapter will provide an overview of the key theoretical perspectives utilised to predict academic performance. It is based on two main theoretical frameworks, the PKT and CLT. Additionally, the chapter will develop the research hypotheses.

Chapter 4: Theoretical Framework

4.1 Introduction

The primary aim of this research is to analyse how well current admission criteria predict the academic performance of Saudi students in accounting programs. Specifically, the study focusses on two educational levels in accounting programs in Saudi Arabia: the bachelor and master programs, each of which has distinct admission requirements. To achieve this, the chapter innovatively integrates PKT (Binder et al., 2019b; Dochy & Alexander, 1995; Hailikari et al., 2007; Thompson & Zamboanga, 2003, 2004) and CLT (Paas et al., 2010, 2016; Sweller et al., 2011; Sweller et al., 2019; Yang & Farley, 2019) to assess the predictive power of various admission criteria in Saudi undergraduate and postgraduate programs.

This chapter is organised as follows. Section 4.2 justifies the adoption of PKT to examine the predictive power of different admission criteria with regard to student academic performance in undergraduate accounting programs. Section 4.3 connects PKT with CLT in examining the utility of English language proficiency for predicting postgraduate accounting students' relative performance. Section 4.4 presents the conceptual framework for this study, followed by hypothesis development, and Section 4.5 provides a summary of the chapter.

4.2 Prior Knowledge Theory

Jonassen and Grabowski (1993) defined prior knowledge as the knowledge, skills and abilities students bring to the learning process. Prior knowledge is characterised as a multidimensional, hierarchical entity comprised of various types of knowledge and skills (Dochy & Alexander, 1995; Hailikari et al., 2007, 2008; McCarthy & McNamara, 2021). PKT offers a framework for educators to consider the nature of, and gaps in knowledge and abilities students carry to their studies (Rankin et al., 2003). Bloom (1976) stated that 'prior knowledge comprises a student's cognitive entry behaviours as those prerequisite types of knowledge, skills, and competencies which are essential to the learning of a particular new task or set of tasks' (p. 32). Students' prior knowledge has been identified as one of the most significant factors influencing their performance (Alexander et al., 1994; Hailikari et al., 2008). According to Glaser and De Corte (1992) (as cited in Dochy

et al., 1999), a well-organised and coherent knowledge base is essential for acquiring a principled knowledge base. Relevant studies, albeit limited, have specifically adopted PKT to explore the role of admission criteria in academic performance (e.g., Binder et al., 2019a; Thompson & Zamboanga, 2003, 2004).

The majority of education studies conducted over the past century (Alexander et al., 1989; Alreshidi, 2023; Amalina & Vidákovich, 2023; Anderson et al., 1978; Ausubel, 1968; Binder et al., 2019b; Chi et al., 1988; Dochy, 1992, 1994; Dochy & Alexander, 1995; Ethington, 1990; Hannafin et al., 1993; Hailikari et al., 2007, 2008; Glaser, 1984; Portier & Wagemans, 1995; Rach & Ufer, 2020; Schmitt & Spatz, 2024; Thompson & Zamboanga, 2003, 2004), have recognised the importance of prior knowledge for both learning and performance. A critical factor influencing academic achievement is the diversity of students' knowledge bases in domains such as economics (Dochy, 1996). Specifically, students with insufficient prior knowledge often have difficulty learning new material (Ausubel, 2000; O'Donnell & Dansereau, 2000). Dochy et al. (1999) found that around 91.5% of studies on prior knowledge showed positive results on students' learning performance related to their prior knolwedge. Moreover, it has been found that individuals who possess significant prior knowledge make better choices, draw conclusions more quickly and work faster than individuals who possess only a limited amount of relevant prior knowledge (Hannafin et al., 1993). Dochy et al. (2002) found that regardless of the methodology, all their data supported the view that prior knowledge had a positive effect on the acquisition of new knowledge. Nevertheless, if students have insufficient prior knowledge as well as misunderstandings in a particular domain, new information may be difficult for them to understand or learn (Hailikari et al., 2007; Wilschut et al., 2023).

According to a constructivist understanding of learning, learning is a cognitive process in which learners construct knowledge by interpreting new information in light of their prior knowledge. Dochy et al. (2002) argued that prior knowledge can explain 30–60% of the variance in students' learning outcomes. Further, prior knowledge has been shown to influence study behaviour and learning strategies (Biggs, 1987; Dochy et al., 1999 Hegarty-Hazel & Prosser, 1991a, b; Ramsden, 2003). It facilitates the acquisition of higher-order cognitive skills (Dochy et al., 2002; Hailikari et al., 2008).

Research has found that discipline-specific prior knowledge plays a particularly important role in student success (Dochy, 1994). As claimed by Bloom (1976), Dochy (1992, 1994) and Krathwohl (2002), domain-specific prior knowledge is critical to gaining new knowledge. An individual's high level of prior knowledge about a topic facilitates learning and vice versa (Ausubel, 2000; Schneider & Pressley, 1997; Thompson & Zamboanga, 2003). Hence, individuals who have a higher level of prior knowledge about a topic can better comprehend and remember the subject matter and are able to perform better on assessment tasks (Chi & Ceci, 1987; Hailikari et al., 2007).

Variables including HSGPA, AT and GAT are used in the literature to measure prior knowledge. These variables have been used to investigate the academic performance of students in higher education. For example, studies have shown that students' academic performance in university accounting programs is significantly influenced by prior performance measured by HSGPA (e.g., Ahmet & Benligiray, 2018; Al-Anazi, 2012; Al-Twaijry, 2010; Al Hazaa et al., 2021; Kobrin et al., 2008; Papageorgiou & Halabi, 2014; Sawyer, 2010; Xiang & Hinchliffe, 2019; Zubairu & Sakariyau, 2016) and CEEs such as SAT, ACT and Gaokao (e.g., Carpenter & Roos, 2021; Eskew & Faley, 1988; Farley & Yang, 2020; Kho & Kho, 1999; Kobrin et al., 2008; Morgan, 1989). However, how the type of prior knowledge, such as declarative knowledge (DK) versus procedural knowledge (PK), influences academic performance in the accounting discipline is under researched in the literature. The following section analyses the two types of prior knowledge and how they are assessed via HSGPA and CEE.

4.2.1 Types of Prior Knowledge

The assessment of prior knowledge hinges on an understanding of the type of knowledge being evaluated. Cognitive research extensively differentiates DK from PK, as highlighted by scholars such as Anderson (1995) and De Corte (1990). Dochy (1992) built on this distinction by categorising prior knowledge as DK or PK. He described DK as the accumulation of knowledge, emphasising its nature as the recognition or reproduction of facts and concepts that become accessible when needed. Anderson (1995) reinforced this by defining DK as 'knowing what', in contrast to PK, which he characterised as 'knowing how', highlighting its application during assessments.

Posner (1978) expanded the definition of DK to encompass facts, symbols, concepts and principles in a specific field. However, Cohen (1983) refined this by focussing solely on factual knowledge, excluding the broader propositional and descriptive elements incorporated in Posner's and other definitions. This refined understanding was supported by Greeno (1980) and Lodewijks (1981), who further delineated the different types of knowledge. DK is often referred to as descriptive, formal or propositional knowledge—or 'knowing-that'—and is linked to declarative memory, as discussed by Ten Berge and Van Hezewijk (1999). DK includes information about events and facts, typically verbalised and retrieved quickly (Kump et al., 2015; Neely, 1989).

In contrast, PK is understood as the knowledge of actions, manipulations and skills. Anderson et al. (1977) described PK as encompassing these aspects, with Anderson (1980) characterising it as the reutilisation of stored knowledge. Millward (1980) viewed PK as being formatted like programs or routines, enhancing efficiency through embedded functions. Cohen (1983) extended this definition to include skills, rules, procedures and plans. Messick (1984) contrasted PK with DK by asserting that PK directly relates to action, whereas DK requires interpretation before it can lead to action. Bechtel and Abrahamsen (1991) argued that PK is dynamic and cannot be easily reduced to a sequential rule system.

Further comparison between DK and PK was provided by Kump et al. (2015), who stated that while DK involves recalling facts and events and making comparisons, PK refers to knowing how to perform tasks, where repetition is key to acquiring PK. DK is generally easier to acquire and requires fewer cognitive resources than PK (Anderson, 1995). Despite their interconnectedness, distinguishing between declarative and procedural representations is challenging. For example, Anderson et al. (1997) noted that PK, being habitual, is less flexible and harder to apply in unusual situations. Jacoby (1991) added that because PK is often implicit, it operates automatically and is difficult to control. However, Ten Berge and Van Hezewijk (1999) argued that DK and PK are fundamentally different, with DK being a component of PK. Similarly, Hong et al. (2018) asserted that the primary learning process for DK involves understanding and retention, while PK development begins with acquiring DK and then practising the associated skills. A review of the literature highlights the nuanced differences and interdependencies between DK and PK, emphasising their distinct roles in cognitive processes and learning.

Adding to the distinction between DK and PK, Hailikari et al. (2007) further refined these concepts by identifying sub-elements in each (see Figure 4.1). This nuanced understanding is widely acknowledged in educational practice (Alreshidi, 2023; Binder et al., 2019a; Hailikari & Nevgi, 2010; Keeves, 1988; Rach & Ufer, 2020; Schmitt & Spatz, 2024). Specifically, Hailikari et al. (2007) divided DK into two levels: knowledge of fact and knowledge of meaning. Knowledge of fact represents the most basic level of DK, encompassing the ability to identify or reproduce fundamental concepts, such as the enumeration of basic terms. The next level, knowledge of meaning, involves a deeper understanding, requiring students to provide accurate descriptions or explanations of terms. Assessments focussed on DK often involve relatively simple, reproductive tasks that do not necessitate the integration or application of knowledge.

Conversely, PK is subdivided into the integration of knowledge and the application of knowledge. According to Hailikari et al. (2007), PK is characterised by the ability to integrate knowledge and understand relationships between concepts, with the highest level involving the application of this knowledge to problem-solving scenarios. This aligns with the broader definition of PK as 'knowing how' and is closely associated with higher-order cognitive skills. Figure 4.1 illustrates the types of prior knowledge and their sub-elements, demonstrating how these components interact, as outlined by Hailikari et al. (2007, p. 324).

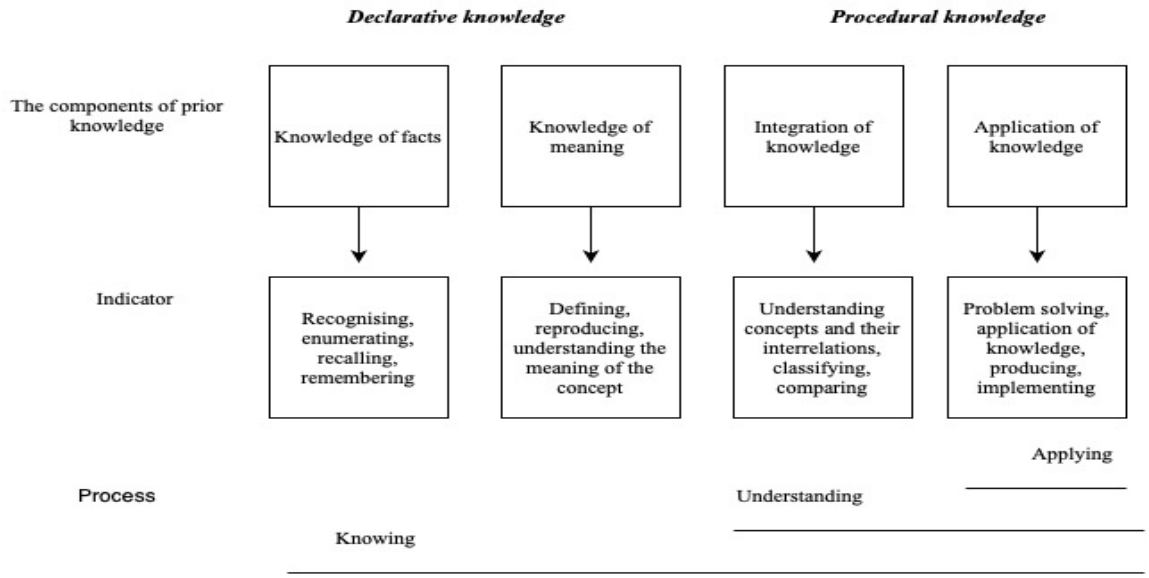

Figure 4.1: Prior knowledge model (Hailikari et al., 2007, p. 324)

Building on the recognition of the diverse nature of prior knowledge states, this research seeks to examine which types of prior knowledge, as reflected in university admission criteria, most significantly influence the academic performance of accounting students in Saudi Arabia. Specifically, the study focusses on distinguishing between DK and PK and how these different forms of prior knowledge impact the acquisition of new knowledge and subsequent academic performance. The objective is to provide a clearer understanding of the role that DK and PK play in shaping a student's academic performance, thereby informing more effective admission practices and educational strategies.

4.2.2 Justification for the use of Prior Knowledge Theory in this Study

Research on cognition and learning has long studied knowledge and its key dimensions. It is widely recognised that prior knowledge serves as a major cognitive predictor of academic performance (Ramist et al., 2001). Studies (e.g., Anderson, 1995; Binder et al., 2019a; Binder et al., 2019b; Dochy, 1992; Dochy & Alexander, 1995; Hailikari et al., 2007) have differentiated between DK and PK and its impact on academic performance. Building on and expanding this investigation, this research aims to analyse how various admission criteria (HSGPA, GAT & AT) influence accounting students' academic performance measured by PYP courses, PYPGPA, first-year core courses, FYGPA and overall GPA. The study hypothesises that these types of prior knowledge will differentially predict accounting students' academic performance.

According to the knowledge model proposed by Hailikari et al. (2007), there are two main types of knowledge based on the complexity of a task and the cognitive processes required to solve it. Their research on knowledge types at the university level aimed to predict academic achievement (e.g., Hailikari et al., 2007, 2008). Their studies and others on academic achievement used subject-specific tests as an indicator of students' knowledge and grades at the end of the semester. For example, Hailikari and Nevgi (2010) identified cognitive predictors of academic achievement in chemistry. According to their detailed definitions of prior knowledge types, they were able to predict students' performance in chemistry, concluding that students with sophisticated prior knowledge are more likely to pass the final chemistry exam. These results indicate that sophisticated prior knowledge and higher-order thinking approaches (e.g., problem solving) are important prerequisites for academic learning at university. Additionally, Binder et al. (2019a) applied a prior

knowledge model developed by Hailikari et al. (2007) to predict students' achievement in introductory biology and physics courses at university. For biology students, DK was found to be a reliable indicator of successful performance on all subject-specific exams during the first two semesters. These studies either explored the integration of knowledge among students or focussed on predicting academic achievement by analysing cognitive traits. The purpose of knowledge integration research is primarily to investigate how students acquire an understanding of scientific concepts and science itself (Liu et al., 2008). The focus of such studies is on continuous conceptual understanding, rather than the influence of various types of prior knowledge or its acquisition through previous academic performance such as HSGPA and CEE. In contrast, prediction studies analyse factors influencing academic performance and categorise students, but rarely examine how prior knowledge is acquired directly in the context of the university.

Given this gap, this study proposes a thorough investigation into how different types of prior knowledge, specifically admission criteria such as HSGPA, GAT and AT, impact knowledge acquisition. Evaluating how these criteria influence knowledge acquisition among students who have performed differently in educational settings prior to university may reveal significant differences in both their prior knowledge and its development at the university level. Such findings may lead to targeted interventions to enhance specific types of knowledge.

This research aims to assess how two types of prior knowledge impact the academic performance of accounting students across different stages of their studies, measured by PYP, the first year and overall GPA. Given its strong predictive value for academic achievement (Robbins et al., 2004) and in line with the work of Hailikari et al. (2007), this research selected HSGPA, GAT and AT to define and differentiate student groups. This approach allowed investigation of whether, for instance, HSGPA is associated with subject-specific knowledge acquisition at university, as measured by students' performance in various subjects in high school.

The choice of accounting as the focus of this research assumes that it presents unique learning challenges. In Saudi Arabian business colleges, students commence their studies with mathematics and statistics courses during the PYP. Additionally, the first-year core curriculum integrates mathematics, economics and accounting subjects, while the overall GPA reflects students' performance throughout their academic journey in the accounting

program. These measurements collectively emphasise application and problem-solving skills, which are consistent with PKT.

To further the investigation, this research developed a framework referred to as the 'prior knowledge continuum' to visualise different types of prior knowledge (DK *v*. PK), as illustrated in Figure 4.2. Moreover, the research assessed the types of prior knowledge associated with HSGPA, GAT and AT based on existing models. The analysis indicates that the GAT is predominantly DK with less PK, while the AT is more PK with less DK. The findings suggest that HSGPA is the criterion most closely associated with PK; less so with DK. Further explanation of each of these factors is provided in depth below.

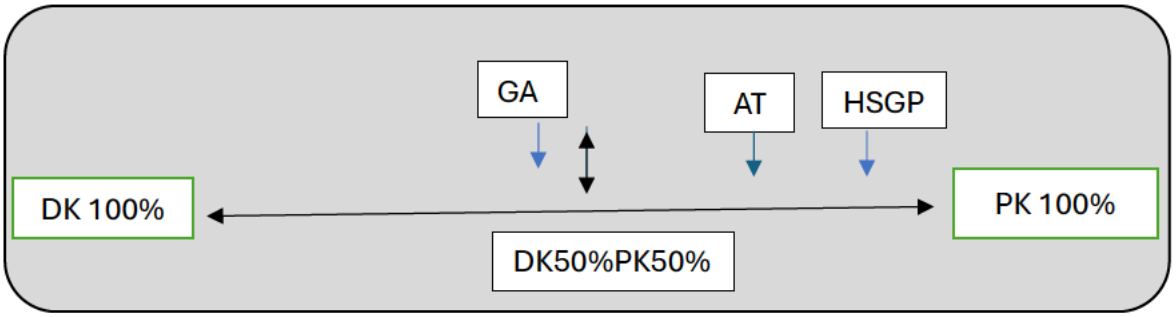

Figure 4.2: The three measures in the line of types of knowledge

4.2.2.1 GAT and Assessed Type of Prior Knowledge

Hailikari et al. (2007) defined DK as comprised of both knowledge of facts and knowledge of meaning. These elements of DK operate at a relatively low level of abstraction and are typically assessed through simple reproduction tasks, despite addressing different dimensions of knowledge (see Section 4.2.1).

The first explanatory variable in this study is the GAT. Although the NCAHE (2024) claims that the GAT is designed to evaluate general learning ability irrespective of specific skills in particular subjects or topics—an approach that would seemingly align with PK—closer analysis suggests otherwise. Upon examining translated samples from the GAT provided in Appendix A, it becomes evident that many of the questions are relatively straightforward, assessing basic knowledge rather than higher-order cognitive skills. This observation supports findings from the Review of National Policies of

Education in Saudi Arabia (2020), which noted that many GAT questions can be answered through memorisation alone.

For instance, the reading section of the GAT primarily evaluates basic comprehension skills, where most answers can be directly extracted from the text. This suggests that the test leans more towards assessing DK, as it requires recognition and recall rather than the integration and application of knowledge typically associated with PK. Hailikari et al. (2007) also demonstrated that students with higher-order thinking skills perform better in prior knowledge assessments and tend to achieve higher final scores, which indicates that a test truly aligned with PK should challenge these higher-order skills.

Moreover, the quantitative section of the GAT, which includes arithmetic, algebra, geometry and the interpretation of graphs and tables (see Section 2.5.2.1 & Appendix A for details), further reinforces the test's alignment with DK. These areas require factual recall and basic problem-solving skills rather than the complex, procedural application of knowledge.

Given this evidence, it appears that the GAT is more aligned with DK than PK. Consequently, this research considers the GAT to be primarily declarative in nature, with limited alignment to PK (see Figure 4.2).

4.2.2.2 AT, HSGPA and Assessed Type of Prior Knowledge

Hailikari et al. (2007) defined PK as the ability to integrate knowledge and comprehend relationships between concepts, as well as to apply this knowledge to problem solving at the highest level (see Section 4.2.1). As a second explanatory variable, AT examines students' prior knowledge of science courses in high school (biology, chemistry, physics & mathematics) and focusses on the material of the official three-year (scientific) curriculum of high schools (see Section 2.5.2.2 & Appendix B for more details). Additionally, following the approach of Binder et al. (2019a) in designing diagnostic prior knowledge tests or pretests, Binder et al. (2019a) assess students on subjects they studied in high school to determine their prior knowledge. Therefore, the AT in this research mainly tests students' prior knowledge focussing on science subjects such as biology, chemistry, physics and mathematics.

Further, in reviewing the AT, including the translated samples provided in Appendix B, it is apparent that AT questions require a deep understanding of the science curriculum covered in secondary school and may prove challenging for students with limited prior knowledge. This observation is confirmed by the Review of National Policies of Education in Saudi Arabia (2020) as discussed in Chapter 2, which explained that 'The sample AT was expectedly more difficult than the GAT contained questions that were more appropriate for Grade 12 students (the test covers content from Grades 10, 11 and 12)' (p. 168). Accordingly, the AT can be considered to assess more PK than DK (see Figure 4.2).

The last explanatory variable is HSGPA, which measures overall high school achievement. HSGPA has been employed for predicting scientific accomplishment through a range of markers for subject-specific prior knowledge. Indicators of subject-specific prior knowledge, such as high school science grades or course enrolment, were found to be associated with achievement in social science courses (e.g., accounting & economics). Binder et al. (2019a) argued that HSGPA indicators deal only indirectly with prior knowledge and do not determine the direct prior knowledge relevant in first-year courses. Conversely, Duff (2004) argued that high school performance was the most significant predictive variable for performance in first-semester accounting and business modules. According to Farley and Ramsay (1988), having studied mathematics in the final year of secondary school was significant for the performance of first-year accounting students. In the same manner, Rankin et al. (2003) argued that there is a reasonable expectation of variation in results. Based on the theoretical framework discussed previously, high school accounting is only beneficial if it provides domain-specific information. Likewise, a study by Keef and Hooper (1991) provided evidence that high school accounting would only benefit students when there is close correlation between high school and university curricula. Hailikari and Nevgi (2010) claimed that the context of science education may have a significant influence on prior knowledge because the nature of scientific knowledge is cumulative. According to Robbins et al. (2004), HSGPA is a reliable predictor of academic achievement in a variety of subjects. However, it integrates both subject-specific knowledge and general cognitive skills, making it a more generalised indicator than one that is specific to any one subject area.

As discussed in Chapter 2 (see Section 2.4.1), students in high school in Saudi Arabia undergo various assessments across all courses. Across 40 courses, these assessments contribute to calculation of the HSGPA. All students, regardless of whether they pursue a science or arts pathway, will take the same courses in Year 10, which include courses such as physics, chemistry, biology and mathematics. Although students may diverge into different courses and assessments during Years 11 and 12, the foundational knowledge in these core areas remains relevant (see Tables 2.1 & 2.2). According to this researcher's estimation, HSGPA represents the highest level of PK among all variables in the prior knowledge framework (see Figure 4.2).

According to Dochy et al. (1999), assessment design can affect how prior knowledge influences performance. A review of the literature reveals diverse concepts and measurement tools used in studies to measure prior knowledge. Although this variety can complicate comparisons, it also enables examination of how different measures of prior knowledge affect educational outcomes in various contexts (Dochy et al., 1995).

Studies have consistently indicated that students who build on their prior knowledge, as reflected by their HSGPA and CEE scores, are more likely to succeed in college (Al Alwan, 2009; Al-Alwan et al., 2013; Alnahdi, 2015; Alshammari, 2020; Alhurishi et al., 2021; Qahmash et al., 2023). Thus, most universities use HSGPA and CEE scores to predict academic performance at the higher education level. Use of these measures is crucial in assessing accounting students' prior knowledge and measuring their readiness for university studies, ultimately increasing their chances of success (Binder et al., 2019a). Previous research (Vista & Alkhadim, 2022) hypothesised that HSGPA and CEE scores (GAT & AT) will be significant indicators of success in the PYP, first-year core course performance, FYGPA and overall GPA in the accounting program. Further, the research aims to determine which type of prior knowledge—DK or PK—more effectively predicts academic performance in accounting students. Specifically, this research aims to explore how different types of prior knowledge affect students' academic performance in accounting. Thus, a careful review of the literature (see Sections 3.2.4 & 3.5) shows that research has neglected to examine the impact of prior knowledge on the differentiation of types of prior knowledge in education—specifically the accounting discipline. Therefore, this research contributes to the literature by examining the impact of different types of prior knowledge on the performance of Saudi Arabian accounting students.

4.3 Prior Knowledge and Cognitive Load Theories

Studies have found that students with different levels of prior knowledge in a relevant discipline of study perform differently during subsequent learning in several dimensions (Fazio et al., 2016; Mihalca et al., 2011; Paas et al., 2010; Sweller et al., 1998; Yüksel, 2014). Students with greater prior knowledge tend to learn more effectively (Fazio et al., 2016; Yüksel, 2014), have a more positive attitude (O'Donnell & Dansereau, 2000; Usman & Miranda, 2020; Winters et al., 2008; Yüksel, 2014), manage their learning more efficiently (Bernacki et al., 2012; Mihalca & Mengelkamp, 2020; Song et al., 2016) and demonstrate greater perseverance (Hattie & Yates, 2013; Riazy et al., 2020) compared to those with less prior knowledge.

Studies have emphasised the crucial role of prior knowledge in the development of a learner's schemas. Bryant and Hunton (2000) highlighted that prior subject knowledge is a key attribute for learners. Effective learning occurs when individuals can integrate new information into their existing schemas and establish meaningful connections among them. Specifically, in accounting education, studies have demonstrated that prior accounting education has a positive impact on university-level accounting learning, resulting in less CL (e.g. Farley & Ramsay, 1988; Keef & Hooper, 1991; Rohde & Kavanagh, 1996; see Section 3.2.4 for further details). Further, learning is influenced by prior knowledge (Johnson & Lawson, 1998), as has been extensively studied in science education. It is widely acknowledged that prior knowledge plays a vital role in the learning process (Bartlett, 1995; Yeh et al., 2012). It is associated with a reduction in CL, which leads to better learning performance (Mihalca et al., 2011; Myhill & Brackley, 2004; van Riesen et al., 2019). Dong et al. (2020) demonstrated that prior knowledge was positively correlated with learning engagement, and this relationship was mediated by CL and instrumental help-seeking. Specifically, students with more prior knowledge and lower CL were better able to exercise high levels of instrumental help-seeking, which resulted in superior quality learning engagement, and vice versa.

According to CLT, prior knowledge is associated with the schema of learners, which affects learning efficiency when processing new information (Cook, 2006). New knowledge is processed in the working memory (WM)—which is limited memory—and a new cognitive schema is constructed in the long-term memory (Sweller et al., 1998). In this context, CL is influenced by factors such as subject characteristics, task

characteristics and their interaction (Paas et al., 1994). Prior knowledge is a characteristic of a subject, and students with more prior knowledge may have a greater capacity for processing their current learning tasks (Mihalca et al., 2011). Schema theory supports this, emphasising that prior knowledge is a crucial factor in forming a new cognitive schema to gain new knowledge (Bartlett, 1995). Further, research indicates that prior knowledge can reduce CL, leading to increased learning engagement (Mihalca et al., 2011; Myhill & Brackley, 2004). Students with low prior knowledge need more assistance to reduce CL, while those with high prior knowledge are more likely to form new schemas and perceive a lower CL (Myhill & Brackley, 2004; van Riesen et al., 2019). Mihalca et al. (2011) argued that students with higher levels of prior knowledge will have more WM available for identifying their current level of learning and academic needs and selecting their own learning strategy. Thus, prior knowledge and CL are related, underscoring the importance of leveraging existing knowledge to enhance learning efficiency that positively impacts performance.

CLT was developed in the early 1980s as a framework for researchers to examine instructional methods and design (Paas et al., 2003). CLT is 'concerned with the learning of complex cognitive tasks, in which learners are often overwhelmed by the number of interactive information elements that need to be processed simultaneously before meaningful learning can commence' (Paas et al., 2010, p. 116). CLT is based on a cognitive architecture that consists of limited WM—interacting with comparatively unlimited long-term memory—and partly independent processing units for visual/spatial and auditory/verbal information (Paas et al., 2016). According to Clark et al. (2011, p. 7), CLT refers to 'a universal set of learning principles that are proven to result in efficient instructional environments as a consequence of leveraging human cognitive learning processes'. Paas et al. (2010) further explained that the goal of CLT is to predict learning outcomes while considering both the strengths and constraints of human cognitive processes.

4.3.1 Working Memory versus Long-term Memory

WM, also known as short-term memory, is frequently associated with our conscious thought processes, as suggested by Sweller (1999). CLT describes that short-term memory (i.e., WM) must first process information before it can be processed in long-term memory through construction of schemas. Research (e.g., Baddeley, 1986; Miller, 1956)

has indicated that WM has a limited capacity, typically able to hold only around five to nine pieces of information simultaneously. The capacity of WM to process information concurrently is even more restricted, as it can handle only around two to four elements at a given time, as determined by Sweller (1999) and Van Merrienboer and Sweller (2005). Given this limited capacity, when the CL exceeds the WM's capabilities, learning becomes inefficient, adversely affecting the learner. Consequently, CLT provides guidance for the development of knowledge to inspire students to work to maximise intellectual efficiency (Sweller, 2010).

Conversely, long-term memory is capable of storing a virtually limitless amount of knowledge (Chase & Simon, 1973; Sweller, 1999). As a result of its vast capacity, long-term memory is often viewed as merely a large storage space for memories. Sweller (2003) pointed out that long-term memory plays a crucial role in allowing humans to manage and use vast amounts of previously acquired and stored information, which is essential for its role in problem solving and other cognitive functions. Information in long-term memory remains outside conscious awareness until it is activated and brought into WM.

4.3.2 Schemas and Learning Efficiency

In long-term memory, knowledge is stored in cognitive structures known as schemas (Chi et al., 1982). Essentially, as Sweller (1999) explained, schemas are cognitive structures that enable WM to handle multiple pieces of information as if they were one single element. Consequently, these schemas are stored in long-term memory and contribute to a reduction in the CL on WM. Although a schema may contain a great deal of information, it is processed in WM as a single unit. Therefore, the knowledge in long-term memory is organised into domain-specific schemas and is accessed as needed by the WM.

Chunking is the process of combining individual elements into a single unit, thus increasing the capacity of WM to handle and manipulate more information (Sweller, 1994). Schemas serve both as storage devices and organisational tools, reducing the burden on the WM (Sweller et al., 1998). Thus, the primary objective of instruction is to develop and automate schemas. However, to store information as schemas in long-term memory, it must first be processed and managed in the WM. Importantly, CLT has been

used to develop instructional methods that make efficient use of WM capacity (Paas et al., 2003).

The process of gaining schemas is essential to learning, as is the process of automaticity that occurs after material has been learned and stored in long-term memory. Automating schemas facilitates the subconscious processing of information, thereby reducing the CL on WM (Paas et al., 2003; Sweller, 1999). Chi et al. (1982) found that novices lacking proper schematic structures had significant difficulty solving physics problems. Additionally, Van Gog et al. (2005) evaluated the performance of experts during various stages of troubleshooting an electrical circuit by using eye-tracking techniques. They emphasised that classifying learners based on their level of expertise can enhance instructional design methods. Domain-specific schemas are key to both learning effectively and achieving expertise. Therefore, to enhance cognitive efficiency and foster expertise in various learning domains, it is vital to develop and use schemas in long-term memory effectively. This highlights the fundamental role schemas play in educational strategies and cognitive development.

CL is defined as a multidimensional construct that represents the load that performing particular task places on a learner's cognitive system (Paas & van Merriënboer, 1994). Overall, CL is the sum of intrinsic and extraneous CL, and germane resources.

4.3.3 Cognitive Load and Germane Resources

According to Sweller (2010), CL is composed of intrinsic and extraneous load. Intrinsic CL is concerned with the inherent complexity of knowledge that must be understood. This content must be learned unencumbered by instructional concerns such as how the knowledge should be delivered or in what activities learners should participate to maximise learning (Sweller, 2010, p. 124). The intrinsic CL remains constant for any particular task regardless of the learner's existing knowledge. It can only be modified by altering the fundamental nature of the task or by changing the learner's knowledge base. Fundamentally, intrinsic CL is influenced both by the way in which learning occurs and by the learning process itself (Sweller, 2010).

The concept of intrinsic CL, which is linked to element interactivity, varies based on the task and the knowledge of the learner (Sweller, 2010). It is important to note that an 'element' refers to any unit of knowledge, such as a concept or a procedure. Tasks with

low element interactivity, such as learning chemical symbols, place no significant demand on WM because each element is learned independently. In contrast, high-interactivity tasks, like solving algebra equations, require the simultaneous processing of multiple interacting elements, thereby increasing the workload on the WM (Sweller, 2010).

The amount of load depends not only on the number of interacting elements but also on the level of knowledge of the learner. For example, a novice reader whose English language proficiency is low might view each letter in English as a separate element. Conversely, an experienced reader with high English language proficiency is likely to perceive words or phrases as single elements. This difference illustrates how CL can significantly vary depending on the learner's prior knowledge and language proficiency.

Extraneous CL refers to the mental effort induced by the instructional methods, procedures and materials used during the teaching process. As Sweller et al. (1998) noted, this type of CL can negatively impact the acquisition and automation of schemas, thereby hindering learning. Unlike intrinsic CL, extraneous CL depends entirely on the instructional approach used (Sweller, 1994). In more specific terms, extraneous load is the result of an unnecessary load resulting from the design and organisation of learning material (Cook, 2006; Kalyuga et al., 1998). Extraneous CL, however, is impacted by instructional factors and therefore can be eliminated by altering instructional procedures (Sweller, 2010, p. 136).

It is essential to note that extraneous CL is caused by unsuitable instructional formats which result in additional effort. Extraneous CL has been classified in several ways by CLT, not all of which are identical. The extraneous CL may be attributed to the format of instruction, which leads to an excessive level of interactivity among the elements in the WM (Schnotz & Kürschner, 2007). Alternatively, extraneous CL is defined as cognitive activities that are not relevant to the task at hand. When activities are not directed towards schema acquisition and schema automation, they are considered irrelevant (Sweller, 2005; Sweller & Chandler, 1994).

Research has demonstrated that effective instructional design can significantly reduce extraneous CL (Paas et al., 2003), thus allowing cognitive resources to be diverted to germane resource, which is essential for learning and transfer (Paas & Van Gog, 2006;

Van Gog & Paas, 2008). For instance, Sweller and Cooper (1985) found that using worked examples was an effective method for teaching algebra, as it minimised extraneous CL. Regardless of how extraneous CL is defined, the theory posits that it interferes with learning and should, therefore, be reduced by eliminating irrelevant cognitive activities (Leung et al., 1997; Sweller et al., 1998).

Thus, both intrinsic and extraneous CL are determined by the total of element interactivity. Sweller (2010) defined an element as something that needs to be learned, such as a concept or a procedure. An estimate of the level of element interaction is based on the number of elements that interact and on both the content (content & learning materials) and the characteristics of the learner (learner characteristics). In materials with low element-interactivity, individual elements can be learned without significant reference to others, resulting in a reduced requirement for WM (Sweller, 2010, p. 124; Sweller et al., 2011, p. 59). Conversely, materials with a high element-interactivity contain elements that are closely related and cannot be learned independently. Due to their interaction, learning them in isolation is ineffective. It is essential that all relevant elements be processed simultaneously to enable meaningful learning to occur (Sweller et al., 2011, p. 60). It is important to consider the extent to which learners have developed higher-level schemas or automated schemas, which can reduce the number of interacting elements (see Figure 4.3).

Finally, the effort expended by WM to understand material and form schemas is known as germane resources (Mostyn, 2012), which are concerned with learner characteristics. They refer to the WM resources that a student dedicates to addressing the CL associated with information (Sweller, 2010, p. 126). Germane resources differ from the information presented, except for the way in which it interacts with intrinsic CL.

Crucially, germane resources do not impose a separate load on WM. Learners are not able to control or alter germane resources under the assumption of steady motivation levels (Sweller, 2010; Sweller et al., 2019). Germane resources focus solely on learner characteristics (Yang & Farley, 2019). If the intrinsic CL is high and the extraneous CL is low, germane resources are also high because a significant proportion of WM will be dedicated to coping with fundamental learning materials. In contrast, if there is a rise in extraneous CL, with the same level of intrinsic CL, germane resources are reduced, which

reduces learning efficiency (see Figure 4.3) (Sweller, 2010). Further, Paas et al. (2016) stated:

> because intrinsic load, extraneous load, and germane resources additive, from a CL perspective, it is important to realize that the total CL associated with an instructional design, or the sum of intrinsic CL, extraneous CL, and germane resources should stay within WM limits (p. 65).

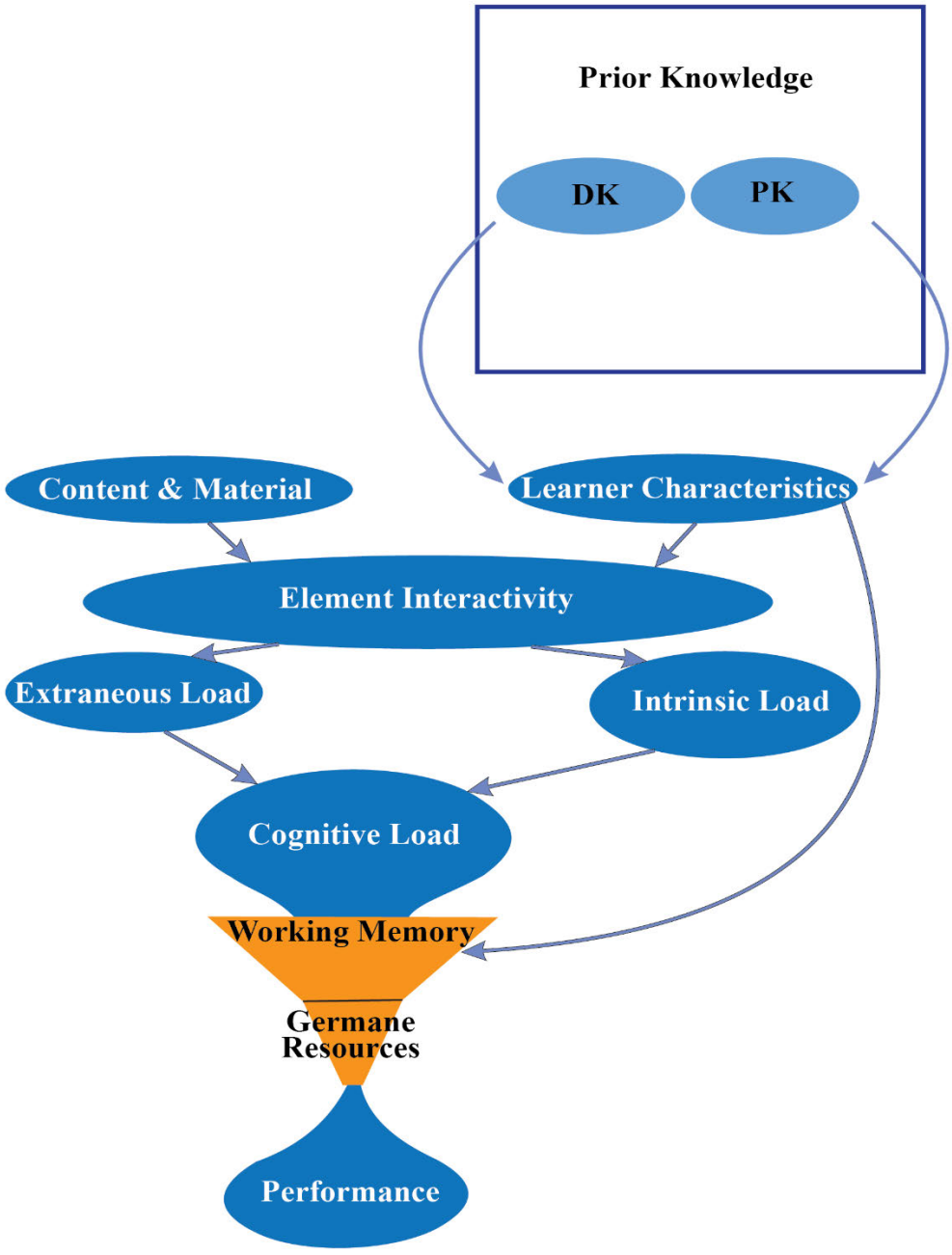

Figure 4.3: Theoretical framework

4.3.4 Application of Cognitive Load Theory in This Study

When considering EMI in accounting programs for EFL learners such as Saudi students, their prior knowledge of academic English language proficiency can significantly impact their academic performance. This is due to the varying levels of CL associated with learning accounting knowledge and skills in a foreign language, as evidenced in recently published studies (e.g., King et al., 2021; Umar & Olowo, 2023; Yang & Farley, 2019) that adopted CLT to empirically examine the impact of language on relative academic performance in EMI accounting programs.

In all accounting courses, EFL students experience more linguistic and psychological issues during their studies than do ENL students, and therefore more CL (Johnstone & Selepeng, 2001). For example, Jackson (2004) stated that in Hong Kong, students in business colleges are worried about making mistakes in their English studies in case this reduces their academic potential. Consequently, because of the psychological impact, the CL of EFL students increases, and they are at a disadvantage compared with ENL students. From the point of view of CLT, the rationale behind the different levels of element interactivity in MC and LC courses is that students with language-related learning difficulties are expected to experience greater element interactivity in MC courses than in LC courses.

The classification of MC versus LC accounting courses or assessments has been informed by research conducted on the topic (see King et al., 2021; Yang & Farley, 2019). Studies that have previously explored MC versus LC courses in university education observed variation in the intrinsic characteristics of subjects, such as hard versus soft, and pure versus applied dimensions (Biglan, 1973; Dafouz et al. 2014; Neumann et al., 2002; Yang & Farley 2019). According to Neumann et al. (2002, p. 408) hard applied disciplines and soft applied disciplines exhibit many parallels: hard applied disciplines advocate for the acquisition of mastery of techniques through a linear process based on factual understanding, and soft applied disciplines are concerned with the accumulation of knowledge through an ongoing process governed by expertise and theoretically derived notions. Further, Yang and Farley (2019, p. 15) explained that with the hard applied dimension, there is a strong emphasis on practical skills and the ability to apply theoretical ideas to professional contexts, while in the soft applied dimension, students are required to apply a more open-ended approach for solving problems using oral and written

communication. In Dafouz et al.'s (2014) study, the researchers added economic history as a soft pure dimension. Economic history was chosen because students who studied in the English language struggled with subjects that were more verbal in content, and economic history was selected to establish validity of findings to test this theory. Yang and Farley (2019) examined six subjects (courses), two of which were MC and four were LC. Thus, in accordance with Biglan's (1973) model, the accounting discipline is classified as an applied discipline with both hard and soft courses. This research adopts the same approach, enabling greater depth of findings, thereby increasing the validity of comparing two groups to evaluate how well English language proficiency measured by IELTS score as an admission criterion predicts the relative performance of Saudi accounting students in MC versus LC accounting courses.

In addition, research has revealed that EFL students are disadvantaged as a result of their lack of experience with the language and misunderstand the various contexts in which English words are used in the field or in discussions. Accounting is often viewed as a subject that involves complex calculations and poses challenges for many students, particularly those with mathematics anxiety (Cohen & Hanno, 1993; Goh & Scerri, 2016; Mladenovic, 2000). This challenge is intensified for EFL students who must learn this demanding subject in a language with which they are not fully comfortable, leading to feelings of being overwhelmed (Umar & Olowo, 2023).

Accounting is a discipline that has both MC and LC courses and activities related to professional decision making. The LC aspect of accounting involves fewer activities related to intensive reading, writing and literature synthesis. The elements are therefore relatively independent of each other, hence imposing less CL on WM. In contrast, MC courses concentrate on reading, articulating and presenting arguments, as well as case analysis and professional judgment, resulting in more element interactivity (Yang & Farley, 2019). EFL students have reported that greater translation efforts are required for MC subjects than for LC subjects (Kern, 1994; Yau, 2011). According to CLT, a greater level of element interactivity results in MC being more challenging for EFL students than LC in accounting courses. Researchers (e.g., Al-Musawi, 2014) have found that EFL learners often rely on mental translation as a cognitive processing strategy to locate an internal system of meaning while attempting to understand the English language. Thus,

this research examines whether English language proficiency measured by IELTS has a different effect on academic performance in two types of accounting course: MC and LC.

4.3.5 The Conceptual Framework

Figure 4.4 illustrates the steps that must be taken to be accepted into bachelor and master programs in accounting. This research aims to determine to what extent these variables predict academic performance. This framework provides a comprehensive representation of the research context.

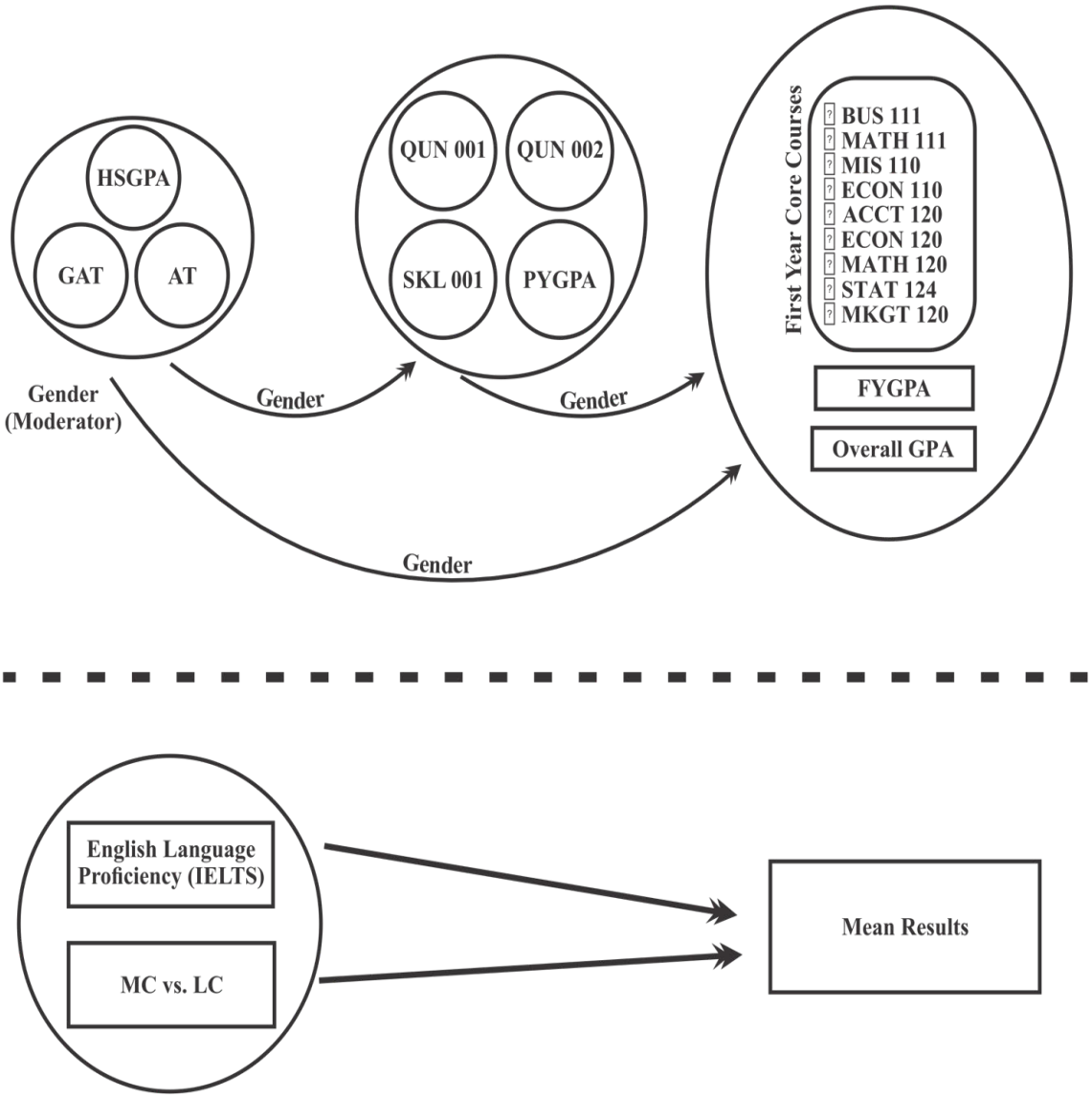

Figure 4.4: The conceptual framework. Refer to Section 5.8.1.2, 5.8.1.3 & 5.8.2.1 for variable names.

4.4 Hypothesis Development

For the purpose of answering the research questions, the independent variables are identified and hypotheses formulated using the Saudi Arabian higher education context, in particular the accounting program. It is the purpose of this section to outline the key predictions of this research, based on theoretical frameworks (see Sections 4.2 & 4.3) and the literature (see Chapter 3).

In the field of education, hypotheses are used to guide the investigation of the influence of prior knowledge, as measured by admission criteria such as HSGPA and CEE, on academic performance. This research analyses these criteria in terms of predicting accounting academic performance. More so, students in high school lack the skills and knowledge required in higher education (Lowe & Cook, 2003).This gap, also known as the 'preparation gap', is caused by a wide range of factors, among them a lack of challenging coursework in high school, inadequate academic support and advice, and a lack of emphasis on problem solving and critical thinking. Therefore, the PYP is crucial according to research (e.g., Ashley et al., 2017; Khoshaim, 2017; Lisciandro, 2022; Wang et al., 2023). This program is designed to help students transition from the high school education system to the university education system, introduce them to a variety of academic fields and prepare them for the university environment before they make a final decision regarding their academic interests (Khoshaim, 2017). Hence, this research analyses the impact of PYP provided by the business college on predicted academic performance in the accounting program.

In addition, a unique feature of the Saudi Arabia education system is that all students, teachers, workers and school leaders are from the same gender, and are employed by educational institutions tailored to their gender (male or female only) (Almulhim, 2021; Barry, 2019; Hamdan, 2005). It is therefore vital to consider gender academic differences in this research, consistent with Almulhim (2021) and Alnahdi and Schwab (2023) who demonstrated that it is important to examine gender differences in various evaluation studies, particularly those conducted in Saudi Arabia.

Further, there is a challenge in switching from Arabic to English as the language of instruction in Saudi Arabian higher education, particularly in business colleges. EFL students experience more linguistic and psychological issues in their studies, and

therefore more CL (Johnstone & Selepeng 2001; Yang & Farley, 2019). Thus, this research investigates the impact of English language ability on relative academic performance.

Based on the theoretical framework (PKT & CLT) and literature review, the following are the associated research hypotheses involving this research's explanatory variables.

4.4.1 HSGPA and CEE (GAT & AT) as Predictors of Accounting Academic Performance

Scholars have long debated the complex and multifaceted ways in which admission criteria predict academic success. Research from around the world has produced a range of findings that keep this discussion active and evolving. For instance, some studies (e.g., Alshumrani 2007; Al Alwan, 2009; Alnahdi, 2015; Bai et al., 2014; Betts & Morrell, 1999; Cohn et al., 2004; Crowther & Briant, 2021; Kobrin et al., 2008; Richter & Trede, 2008; Sawyer, 2013; Shaw et al., 2011; Takele, 2017; Vista & Alkhadim, 2022; Westrick et al., 2019; Zwick, 2023) found both HSGPA and CEE to be significant predictors of students' performance at university. Further research suggested that HSGPA is a stronger indicator of future academic success and more reliable than CEE or any other factor (Alhurishi et al., 2021; e.g., Alshammari, 2020; Cliffordson, 2008; Elert, 1992; Geiser & Santelices, 2007; Geiser & Studley, 2002; Hood, 1992; Molontay & Nagy, 2023; Nagy & Molontay, 2021; Niu & Tienda, 2010; Warren & Goins, 2019). while others found no significant relationship (Al Hazaa et al., 2021; Zubairu & Sakariyau, 2016). Other studies (e.g., Al-Hattami, 2012; Baik et al., 2019; Bettinger et al., 2013; Camara & Echternacht, 2000; Farley & Yang, 2020; Häkkinen, 2004; Price & Kim, 1976; Russell et al., 2021) showed that the accuracy of prediction for academic success improves when using results from CEE.

These studies have produced contradictory results regarding the potential influence of prior academic performance on accounting degree performance. This may be due to either the length of time between studies, or cultural and educational differences between countries. The results of most studies support the thesis that pre-university academic performance in general has a strong effect on student performance. To the best of the researcher's knowledge, no studies have examined the potential impact of student pre-

university performance on PYP, first-year accounting courses, FYGPA and overall GPA, particularly in the Saudi context. Thus, it is hypothesised that:

> **H1:** Each entrance criterion (HSGPA, GAT & AT) is a predictor of academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program.

> **H2:** Each entrance criterion predicts academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program above what is predicted by the other two entrance criteria.

4.4.2 PYP Courses and PYPGPA as Predictors of Accounting Academic Performance

For students seeking admission to business colleges in Saudi Arabia, the PYP has been required since 2010. The PYP offered through business colleges offer three courses: mathematics (QUN 001), statistics (QUN 002) and academic skills (SKL 001) (see Section 2.6.1). Studies based in Saudi Arabia have focussed on medicine (Alamoudi et al., 2021), engineering and computer science (Yushau & Omar, 2007) and multiple disciplines (Khoshaim et al., 2018). Alamoudi et al. (2021) found no correlation between PYPGPA specialised for medical students and academic performance in the basic science courses at KAU. Conversely, Yushau and Omar (2007) demonstrated that success in a Calculus I course at King Fahd University of Petroleum and Minerals was largely dependent on the two PYP mathematics courses as well as their interaction. Also, it was found that the English PYP course was a significant predictor of success in Calculus I. However, to the best of the researcher's knowledge, no study has explored the effect of the PYP provided by business colleges on accounting students' academic performance in first-year core courses, FYGPA and overall GPA in the Saudi context. Accordingly, it is hypothesised:

> **H3**: Each PYP business college variable (QUN 001, QUN 002, SKL 001 & PYPGPA) is a predictor of academic performance in first-year core courses, FYGPA and overall GPA in the accounting program.

H4: Each PYP business college variable predicts academic performance in first-year core courses, FYGPA and overall GPA in the accounting program above what is predicted by the other three PYP business college variables.

4.4.3 Academic Performance Differences between Males and Females

In Saudi Arabia, gender is a special issue because of religious and cultural influences (Almunajjed, 1997; Almulhim, 2021; Alnahdi & Schwab, 2023). The education system is a unique situation because all students, teachers, workers and school leaders in an educational institution are from the same gender. Saudi Arabia's education system has a number of unique features when compared with other Middle Eastern countries (Kanalan & Celep, 2011) and the world (Shavinina, 2009). However, Saudi Arabia's Vision 2030 aims to improve the situation for females in education, the work force and positions of authority. Further, the Saudi education and labour, and social development ministries strive to increase women's access to the labour market and involvement in the global economy (Saudi Arabia's Vision 2030). Tied to the above, high school grading has been criticised: for example, Mahmoud and Alaraj (2018) showed that teachers in high schools tend to provide special treatment for graduating male students by providing summaries of the curriculum to help them to obtain a high GPA. In contrast, the CEE (GAT & AT) administered by the NCAHE—an independent national centre—provides objectivity above other accessible criteria, such as high school grades and structured interviews. Almulhim (2021) and Alnahdi and Schwab (2023) encouraged future researchers to evaluate gender differences in evaluations various contexts, particularly those conducted in Saudi Arabia. Therefore, in Saudi's special situation, it is crucial to test if gender alters the relationship between predictors of academic performance and academic performance. Therefore, it is hypothesised:

H5: Gender moderates the relationship between HSGPA, GAT and AT and each of the PYP and first-year core courses, FYGPA and the overall GPA in the accounting program.

4.4.4 Impact of English language Proficiency Measured by IELTS on Relative Academic Performance

The impact of English language proficiency is an issue of interest for many countries around the world where English is not the primary language. Various studies have

focussed on assessing the impact of English language proficiency on performance of students from non-English speaking backgrounds. Each study has examined a variety of variables to determine if they have a correlation with academic achievement. When assessing the impact of English language proficiency on student performance, most research has relied on either the IELTS (e.g., Aizawa, 2023; Dang & Dang, 2023; Dooey & Oliver, 2002; Feast, 2002; Kerstjens & Nery, 2000 Neumann et al., 2019; Schoepp & Garinger, 2016; Yen & Kuzma, 2009) or TOEFL (e.g., Cho & Bridgeman, 2012; Ginther & Yan, 2018; Krausz et al., 2005; Wait & Gressel, 2009; Wongtrirat, 2010) and in some cases both (e.g., Arcuino, 2013; Hill et al., 1999; Johnson & Tweedie, 2021; Woodrow, 2006), reflecting the country context and methodology of each study. A challenge is presented in Saudi Arabian higher education, which involves the transition from Arabic to English as the instructional language. In regard to the Saudi Arabian context, to the best of the researcher's knowledge, only Dabaliz et al. (2017) has assessed English proficiency measured by IELTS and TOEFL as independent variables as predictors of the performance of undergraduate (medical) students in the Saudi context by measuring their overall GPA. Dabaliz et al. (2017) found that TOEFL significantly predicted pre-clinical year performance, while IELTS was not a significant predictor of pre-clinical GPA.

The accounting research literature reveals that EFL students are disadvantaged as a result of their lack of experience with the language and misunderstand various contexts in which English words are used in the academic context (King et al., 2021; Umar & Olowo, 2023; Yang & Farley, 2019). Hence, it is hypothesised:

> **H6**: Students with a higher level of English language proficiency as measured by IELTS score as the admission criterion perform relatively greater in MC courses than LC courses.

4.5 Summary

According to PKT, learners' existing knowledge influences their subsequent learning and performance. PKT suggests that students with high levels of prior knowledge as measured by previous performance in high school and admission entrance exams are likely to perform better in college courses than those who do not have such high prior performance.

It is therefore one of the objectives of this research to investigate the impact of variables such as HSGPA, GAT and AT (which are used as admission criteria) on Saudi students' academic performance in accounting. This research hypothesises that these variables reflect the prior knowledge students possess before entering college. Through an analysis of undergraduate accounting students at QU, this research examines the predictive validity of these criteria and their correlation with the performance of Saudi accounting students both in the PYP and the degree.

Additionally, CLT proposes that different accounting topics may produce different levels of intrinsic CL depending on their complexity and abstractness. Thus, English language proficiency, particularly in non-native English-speaking countries like Saudi Arabia, may significantly influence both intrinsic and extraneous CL for accounting students. English language proficiency, as measured by IELTS, indicates a student's ability to comprehend and communicate in English, which is the language of instruction and assessment in most accounting courses. Students with a low level of English proficiency may have difficulty understanding accounting concepts, terms and rules presented in English as well as expressing their ideas and arguments in writing and orally in English. These challenges could lead to increased CL and negatively impact learning outcomes. This research aims to examine the impact of English language proficiency, measured by IELTS, on the relative academic performance of Saudi accounting students in MC and LC courses. The analysis includes Saudi graduate accounting students at KSU who have completed the IELTS exam, providing insights into the impact of language proficiency impact on their academic achievements.

Chapter 5 will explain the empirical methods and approaches used in this research.

Chapter 5: Research Methodology

5.1 Introduction

This chapter presents the research methodology adopted for this research. It begins with the research paradigm and the research methods used to achieve the objectives of the study. Subsequent sections detail the research objectives and questions. The discussion then advances to research design and strategy. An overview of the institutions participating in this research is also provided. Further, the study population, research data collection process and preparation of the data are explained. Finally, the chapter explains the analysis procedures employed to test the hypotheses of this research.

5.2 Research Paradigm

A research methodology is fundamentally the methods and principles used in a study, along with their practical application in an academic context. As outlined by Bryman (2001), it offers a comprehensive orientation and establishes a structured framework that guides the overall conduct of research. This framework includes not only the methods used for data collection and analysis but also the theoretical foundations that inform and shape the research process.

The paradigm adopted in any research can be viewed as the primary vehicle that shapes the manner in which the research can be conducted (Bryman, 2012). Any social study, such as the one presented in this thesis, must take into consideration the philosophical dimensions of epistemology and ontology (Walliman, 2006). Epistemology considers what the best approach is to establish reality. In the social theory sense, Burrell and Morgan (1979) split the methods further, considering whether social reform or social order is a matter for research or a school of thought. Leedy and Ormrod (2005) defined theory as ‘verbal statements, visual models, or series of hypotheses offered to explain the phenomenon in question’ (p. 316). The methodology, therefore, is the functional product of these two principles, which takes into account the measures and methods used to perform a study (Creswell, 2013). These concepts reflect contrasting views about the nature of comprehension, the human–world relationship and ways of thinking (Walliman, 2006). As this research is motivated by positivist theory and determination of precise results, it is considered to involve a scientific method (Creswell & Creswell, 2018).

The positivist approach posits that natural phenomena occur separately from human experiences and are thus not affected by subjective interpretations (Sekaran & Bougie, 2016). The theory debates that a causal link between natural phenomena occurs in society when viewed from a holistic position, rather than at the individual level (Saunders et al., 2007). Further, the positivist theory argues that is not accurate that intuitive and introspective awareness can be felt; hence, studying natural phenomena and events should provide sufficient information to determine characteristics and interactions (Sekaran & Bougie, 2016). The aim of positivist research is to explore the existence of a specific phenomenon in a certain theoretical context, by modifying variables and analysing how the phenomenon changes (Rehman & Alharthi, 2016). From this perspective, positivism uses discovered empirical evidence from a researcher's experiments to determine how much the examined phenomenon has changed (Saunders et al., 2007).

In accounting education research, various methods of collecting information have been used; for example, surveys, quasi tests, secondary data and interviews (Apostolou et al., 2013). While some researchers have utilised a qualitative or mixed method, most seminal studies in accounting education have applied a quantitative approach (e.g., Alfan & Othman, 2005; Al-Twaijry, 2010; Duff, 2004; Eskew & Faley, 1988; Farley & Ramsay, 1988; Farley & Yang, 2020; Kho & Kho, 1999; King et al., 2021; Yang & Farley, 2019). A quantitative methodology seeks to establish a formal relationship between related variables and to make predictions based on that relationship. As outlined by Bryman (1988, p. 12), 'a genre which uses a special language which appears to exhibit some similarity the ways in which scientists talk about how they investigate the natural order-variables, control and measurement'.

Benke and Street (1992) encouraged accounting education research to apply various methods other than experiments, although Kennedy and Bush (1985) stated that most would agree that experimental research is the most rigorous technique for researchers when investigating educational problems. Thus, based on the literature survey and the phenomenon of this research, this study aims to adopt a quantitative method by collecting secondary data from the first target group; that is, accounting students in higher education institutions in Saudi Arabia. Secondary data design was defined by Creswell (2014, p. 145) as 'A quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population'. The quantitative methodology is the

most appropriate for this research because of its objective to analyse the predictive power of current admission criteria regarding the academic performance of accounting students.

5.3 The Research Objectives and Research Questions

The objective of this research is to analyse the appropriateness of Saudi Arabian university admission criteria for undergraduate and postgraduate accounting coursework programs. This investigation focusses solely on current criteria (HSGPA, GAT & AT) along with the PYP specialised for the business college at QU, considering gender (male & female) as a moderator. Further, this research evaluates how well English language proficiency as measured by the IELTS score as an admission criterion predicts relative performance in MC- versus LC-oriented accounting courses for postgraduates in the EMI context at KSU. This quantitative research aims to answer the following key research questions:

RQ1: Does the HSGPA predict academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program?

RQ2: Does the GAT score predict academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program?

RQ3: Does the AT score predict academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program?

RQ4: How much explanatory power is lost in predicting academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program if a subset of the current admission criteria is used?

RQ5: Do individual courses in the PYP and the Preparatory Year Program Grade Point Average (PYPGPA) in the CBE predict performance in first-year core courses, the FYGPA and overall GPA in the accounting program?

RQ6: Do any individual courses in the PYP add to or out-perform the PYPGPA in predicting performance in first-year core courses, FYGPA and overall GPA in the accounting program?

RQ7: Does gender moderate the relationships between the HSGPA, GAT and AT and each of the PYP and first-year core courses, FYGPA and overall GPA in the accounting program?

RQ8: Does English language proficiency as measured by the IELTS score of Saudi students affect relative performance in two types of accounting course, more conceptually oriented courses versus less conceptually oriented courses, taught in English?

5.4 Research Design

The research design is the overall logic that links the data collection process and the conclusions drawn from the findings to the original research questions. Research designs typically address several fundamental issues: the selection of the research questions to be explored, the identification of relevant data, the specific data to be collected and the methods of data analysis. Based on this concept, Yin (2011) presented five critical components of a research design that are particularly crucial for the integrity of a study:

1. the formulation of the research questions
2. any hypotheses or propositions on which the study is based
3. the rationale that connects the data to these propositions
4. the specific unit or units of analysis in the study
5. the guidelines or standards used to interpret the research findings.

This chapter addresses the key questions that form the basis for this research, as they represent crucial components of its investigation. It explains the aims and objectives that provide the framework for the study, guiding its conception and defining its structure. According to Yin (2009), the formulation of these initial research questions is an essential component of a research strategy. Chapters 1 and 4 provide a detailed description of the hypotheses related to the research questions and objectives of this study. The objective of the research is to critically analyse current admission criteria to determine whether they are effective in predicting academic performance among accounting students, and to compare their relative effectiveness. Detailed explanations of the methodology employed to link the collected data to these research questions are provided in subsequent sections, underlining the systematic nature of the study. Additionally, the analysis or interpretation

of the results is based on a specific methodology. This research uses a quantitative approach to analyse the data and draw conclusions. Methodologically, this approach ensures a structured and objective analysis of the data, facilitating a clear understanding of how admission criteria predict students' academic performance.

Yin (2009) emphasised the importance of explicitly defining the theoretical framework guiding the research in addition to the five fundamental components. An important component of this phase is the explanation of the theoretical perspectives and approaches used to develop the research design. The theoretical framework is the backbone of the research process and emerges from a thorough literature review. For this research, following a comprehensive literature review, PKT and CLT were selected because of their relevance to the research questions and hypotheses. The selection of these theories is strategic to ensure that the research is based on a solid conceptual framework. The connections between these theories and the variables under investigation in this research are meticulously discussed in Chapter 4 (see Sections 4.2 & 4.3). As a result of this detailed analysis, a comprehensive understanding of PKT and CLT is provided, allowing for a coherent and insightful framework for analysing the data collected.

5.5 Research Strategy

Blaikie (2000) stated that research strategies are comprised of a series of steps or structured approaches for addressing research questions. The research strategy outlines the planning and execution of the research, integrating one or a combination of methods or investigative techniques (McNeill, 2005). Data collection and analysis are conducted in a systematic manner, providing clarity and direction to the study.

First, the researcher conducted a comprehensive literature review focussing on education and accounting education, particularly in terms of predicting academic performance. As a result of this foundational review, a solid rationale for the study was established and specific research questions formulated. By conducting this review, it was possible to determine what is already known about the topic of interest, if any patterns or trends have already been identified and if any areas have not yet been explored or clarified. This methodical approach was pivotal in shaping the direction and scope of the research, ensuring a well-grounded understanding of the subject matter.

The overall research strategy was determined after completion of the literature review and formulation of the research questions. Using secondary data from student records to predict academic performance suits this research, although it has both advantages and challenges. As a first step, one of the main challenges is to identify data sources that are relevant to the specific research problem at hand. In addition, the researcher must ensure that they have access to and can retrieve data relevant to their work, especially in the current context, which is considered by the VU, QU, KSU ethics committees to involve high-risk data. It is also essential to assess data quality, where the researcher must rigorously determine whether the secondary data meet the strict requirements of the current investigation and adhere to the methodological standards of robust scientific inquiry as outlined by Hox and Boeije (2005). This ensures the data are relevant and reliable, thus forming a solid foundation for the research.

Utilising secondary data from student records to investigate the predictive power of academic performance has substantial benefits. Among these is access to historical data, which allows for analysis of long-term trends (Hattie, 2008). The reliability of these data is further enhanced by the standardised collection and maintenance methods adopted by educational institutions (Hox & Boeije, 2005; Kuh et al., 2006). By using this approach, it is possible to assess and analyse the predictive value of various variables; in this instance, the influence of variables used as admission criteria on future academic performance. Consequently, this methodological choice enhances the study's accuracy and reliability, thus providing a solid foundation for its conclusions. Numerous studies investigating academic performance in accounting education have similarly utilised secondary data (e.g., Baldwin & Howe, 1982; Duff, 2004; Eskew & Faley, 1988; Evans & Farley, 1998; Farley & Ramsay, 1988; Farley & Yang, 2020; Jackling & Anderson, 1998; Papageorgiou & Halabi, 2014; Rohde & Kavanagh, 1996; Uyar & Güngörmüş, 2011; Yang & Farley, 2019).

Before formulating research questions and hypotheses, it was vital to identify the target population and—more importantly—confirm data availability. Specifically, this research focusses on undergraduate and postgraduate accounting students in Saudi Arabia. The selection of the sample and universities was primarily based on data accessibility, which aligns with the research objectives. Further details of the selected universities and derived

sample can be found in the following section, which explains why these specific institutions were chosen for data collection.

5.6 Institutional Context

Saudi Arabia's higher education is primarily divided into universities and technical colleges. A university is primarily focussed on comprehensive education and research activities, while a technical college is more vocationally oriented and aligned with employment opportunities in the workplace (Al-Nassar et al., 2022). According to the Saudi qualification framework, educational offerings range from associate to doctoral degrees, including bachelor and master degrees. Additionally, diploma and postgraduate diploma programs, also called higher diplomas, are available to students. In the 13 administrative regions of the country, 29 public universities and 14 private universities offer a wide range of educational opportunities (see Section 2.6 for more details on Saudi Arabia's higher education system).

The objective of this research is to analyse current admission criteria in relation to academic performance of students enrolled in both undergraduate and graduate programs in accounting. Given the specific objectives of this research and the challenge of obtaining relevant data, the investigation focusses on data collected from two public universities in Saudi Arabia: QU and KSU. The following sections provide an overview of each university, including its admission requirements, which are crucial to understanding the context and scope of this research.

5.6.1 Overview of Qassim University

QU, one of Saudi Arabia's comprehensive public universities, was founded as a strategic move in the national plan to broaden higher education across the country. The establishment of QU in the 2003–04 academic year came under *Supreme Decree No. 7/B/22042* through the merging of branches of KSU and Imam Muhammad bin Saud Islamic University in the Qassim region. QU has significantly grown to include a current 38 colleges offering a diverse range of programs including 59 bachelor degrees, 62 master programs and 19 doctoral programs. These span various fields of study including Sharia, Arabic language, business, social sciences and specialisations in science, engineering and health disciplines. Since its inception, the university has witnessed remarkable growth,

not only in enrolments but also in the expansion of faculty and administrative staff. By the end of 2019, the number of students registered at QU had reached almost 70,513 students. Further, faculty members numbered 3,956, supported by a professional staff of 3,354.

Transitioning to a specific college in QU, the CBE was established with royal approval in 1981 as a branch of KSU in the Qassim region. The CBE began receiving students in 1982, seeing its first class graduate in 1986. Later that year, a female section of CBE was established, admitting its first students in the following year. Eventually, this branch became part of QU, recognised as one of its first-established colleges. The CBE is comprise of four academic departments: the Department of Management, Information Systems and Production Management; the Department of Accounting; the Department of Business Administration; and the Department of Economics and Finance. Within these departments, various programs are offered at three academic levels: bachelor, master and PhD. The comprehensive offerings and structured growth of QU and CBE underline their vital roles in the educational landscape of Saudi Arabia.

5.6.1.1 Admission Requirements at Qassim University

The CBE at QU requires that for students to be accepted into the PYP at undergraduate level in the college, they must provide their HSGPA, GAT and AT scores. To progress to the degree, they must pass the PYP. The admission requirements consist of HSGPA, GAT and AT scores, with each being weighted in the decision-making process. The maximum score for each of HSGPA, GAT and AT is 100. The HSGPA and GAT scores are each weighted at 30%, and the final 40% is attributed to the AT score. The admission office at QU recently indicated that in each year, they have different demands for the minimum weighted score because this depends on the capacity of the college and the level of class enrolments. The required minimum weighted score also differs between male and female candidates in any given year, as determined by the target capacity for each group. The PYP in the CBE is one semester in duration and students should pass three courses: mathematics (QUN 001), statistics (QUN 002) and academic skills (SKL 001) to be enrolled in the degree. Thus, this research collected HSGPA, GAT and AT to examine their predictive power for performance in the PYP, first-year core courses, FYGPA and overall GPA. The research aimed to test the predictive power of PYP courses (QUN 001,

QUN 002 & SKL 001) on performance in first-year core courses, FYGPA and overall GPA.

5.6.2 Overview of King Saud University

KSU is a public university located in Riyadh, Saudi Arabia. Established as Riyadh University in 1957, it was the first university in the country and was renamed KSU in 1982. Prince Fahd, who later became the Saudi king, assumed the office of the first Ministry of Education and was instrumental in the establishment of KSU. He announced:

> We will shortly establish the first Saudi University, this is a foregone conclusion. This university will be one of the most prominent houses of culture and sciences and will be worthy of our country where the light of Islamic faith and civilization has emanated (KSU, 2024; https://shorturl.at/pH5rU)

Subsequently, KSU was opened in Riyadh in 1957. Prince Fahd's commitment to higher education was evident in his statement:

> I am interested, before anything else, in supporting higher and vocational education in this country in order to add a new and illustrious chapter to our glorious history. Establishing a Saudi university with all its colleges, institutes, and laboratories, built according to the highest of standards, is my immediate concern. (KSU, 2024; https://shorturl.at/pH5rU)

In line with *Royal Decree No. 17* in 1957, the university was established to 'disseminate and promote knowledge in our Kingdom for widening the base of scientific and literary study, and for keeping abreast with other nations in the arts and sciences and for contributing with them discovery and invention', in addition to reviving Islamic civilisation and nurturing youth virtue.

The university's campus features 18 libraries, two university hospitals and a mosque. Tuition is free and scholarships are available for both Saudi and international students. All programs are taught in English and Arabic, and applicants from non-Arabic speaking countries are required to pass an Arabic examination.

KSU is comprised of four main colleges: science, health, humanities and community. Within these colleges, there are specialised departments for each subject. The CBA stands out as one of the pioneer colleges, established in 1959. Throughout its six decades, the

CBA has educated many business professionals, managers, entrepreneurs, leaders and political figures. It offers bachelor, master and PhD programs to top-calibre students with excellent academic preparations. Through these achievements and continued growth, KSU has solidified its role as a leading educational institution in Saudi Arabia, with a history marked by success and innovation.

5.6.2.1 Admission Requirements at King Saud University for Postgraduate Accounting

Students who apply for a master degree in accounting at CBA at KSU must have a bachelor degree in accounting with a minimum GPA 3.75 out of 5.0. In addition, students must obtain an IELTS score of at least 5.5 to qualify for admission. Thus, this research collected IETLS scores to examine their impact on the relative performance of accounting master students.

5.7 The Process of Collecting the Data

The data used in this research were obtained from two public universities located in Saudi Arabia. Given that the data collected for this research were considered highly sensitive by the institutions, the researcher was required to undertake particular processes to access the data. This section discusses the process of collecting data from the point of applying for ethics approval to the point of collecting the data. It should be noted that the process of data collection for this research was extensive and complex, requiring the researcher to devote approximately eight months to accessing and collecting the entire targeted data needed for this research.

5.7.1 Before Starting to Collect the Data

Given that this research aims to analyse current admission criteria and their predictive power for academic performance of students, the researcher targeted two public universities in Saudi Arabia (QU & KSU) to serve the objectives of this research. Because of the sensitive nature of the information pertaining to students, the Victoria University (VU) Human Research Ethics Committee and Saudi Arabian university administrators considered this information highly confidential and at risk of unauthorized access or misuse. It was thus imperative to obtain VU's ethics approval as a first step. This process, which involved a detailed application addressing ethics and integrity concerns—including data access, storage and protection measures, took over two months to

complete. To ensure compliance with ethical standards and protect the confidentiality of student data throughout the research, gaining ethics approval from VU was essential before proceeding to request similar permissions from Saudi universities.

Once VU had granted ethics approval, the researcher applied for approval from QU and KSU. During this phase, three key documents were required: the ethics approval from VU, the research proposal and a detailed description of the data needed. Both QU and KSU ethics approvals took more than one month to obtain, marking a crucial step towards conducting the research in accordance with their ethical guidelines.

Thus, the researcher spent approximately four months obtaining all necessary ethics approvals from VU, QU and KSU. This comprehensive process was vital before the data collection phase could be entered into, in accordance with the ethical standards required by these institutions (see Appendix C for copies of the ethics approvals from QU & KSU).

5.7.1.1 Ethical Considerations

It is important for a researcher to have a full understanding of ethics and integrity considerations related to their data collection and design. An understanding of ethical issues was crucial in this research, as some topics were deemed sensitive (e.g., the educators at the Saudi universities defined student grades very sensitive). The researcher therefore followed protocols to protect the data, and protection of confidentiality was also of utmost importance. Four key principles must always be adhered to in social research:

1. no risk to participants
2. informed consent must be given
3. privacy must not be intruded upon
4. no deception should be involved (Diener & Grandall, 1978, as cited in Bryman, 2001).

The researcher took into consideration all research ethics and integrity issues, especially the safety and confidentiality of student grades collected for this research. Ethics approval for this research was obtained and it was deemed by the VU Human Research Ethics Committee to meet the requirements of the National Health and Medical Research Council *National Statement on Ethical Conduct in Human Research* (2018).

5.8 The Sample of the Population and Statistical Approach

This section provides details of the sample population, focussing on undergraduate students from QU and postgraduate students from KSU.

5.8.1 Qassim University

This research sourced its data from the Deanship of Admission and Registration, the PYP and the CBE at QU. CBE offers five undergraduate majors: business administration; finance and economics; accounting; management of information systems; and project management. All these majors share a common first year of study.

The first objective of this research is to investigate and determine the predictive validity of the selected variables—HSGPA, GAT and AT—regarding the PYP in the business college, student performance in first-year core courses, FYGPA and overall GPA. This will determine which predictor, and by association which combination of DK and PK, accounts for the majority of the variance in performance and whether each has incremental predictive power above the others. Further, the study examines whether gender moderates the relationship between GPA, GAT and AT, and PYP, first-year core courses, FYGPA and overall GPA.

The research applies a quantitative methodology. According to Creswell (2014), quantitative research is an approach to analysing the relationship between variables and investigating questions or hypotheses. Therefore, this approach is adopted as the purpose of this investigation is to identify the validity of HSGPA and CEE as criteria in Saudi Arabian higher education business college admission processes. In addition, this research examines the impact of PYP in the business college on academic performance in the degree, as well as the predictive validity of HSGPA and CEEs (GAT & AT) as admission criteria along with gender moderation in performance.

The sample encompassed all students from four consecutive cohorts in the accounting program who enrolled during the academic years 2015–16 and 2016–17 ($N = 608$). Each of these years featured two enrolment semesters and comprehensive data from all four semesters were collected for analysis.

5.8.1.1 The Independent Variables

5.8.1.1.1 HSGPA

The average score of overall courses taken in Years 10–12 is referred to as HSGPA. Students in Saudi Arabia take final exams at the end of each semester in Years 10–12, each of which is worth 50 marks. Each level's course grading also includes 50 marks for semester activities, divided as follows: 30 marks for attendance, participation, homework and research/reports, and 20 marks for each of one or two mid-term exams, with the expectation that their GPA would account for a 30% university admission weighted score (see Section 2.4.1).

5.8.1.1.2 GAT

GAT measures analytical and deductive skills. It focusses on testing the general ability for learning regardless of any specific skill in a certain topic. The test is offered in Arabic, contains 150 multiple-choice items and is administered twice a year (Education & Training Evaluation Commission, 2021). GAT would account for a 30% university admission weighted score (see Section 2.5.2.1).

5.8.1.1.3 AT

AT measures students' achievement in a number of subjects during their study across the secondary stage of education and is presented in Arabic. High school graduates are requested to take the AT if they plan to join a college or university, including a business college. AT is divided into six sections: two for general aptitude questions and four for educational achievement questions (Education & Training Evaluation Commission, 2021). AT would account for a 40% university admission weighted score (see Section 2.5.2.2).

5.8.1.1.4 Gender (moderator)

According to psychological theories, a moderator—or third variable—can affect the relationship between two other variables (Baron & Kenny, 1986). This research uses gender (male *v.* female) as a moderator to analyse whether gender influences the relationships among variables as a result of the many unique features of the Saudi education system, which segregates the teaching of students by gender.

5.8.1.2 The Dependent Variables

This study includes four categories of dependent variables: Preparatory Year Program (PYP) course grades, First-Year core course grades (divided into first and second semesters), FYGPA, and Overall GPA. These academic indicators were used to evaluate students' academic performance and to explore their predictive relationships across various stages of the academic program.

- The PYP variables include three core courses-QUN 001 QUN 002, and SKL 001, as well as the PYPGPA, calculated based on these three courses.
- The First-Year courses include nine core courses across the first and second semesters. The FYGPA was calculated from the final marks of these ten courses.
- Overall GPA represents each student's cumulative GPA as recorded by the Admissions Office.

Note: Full courses descriptions and details on GPA calculations are provided in Appendix C.

Regarding the procedures for obtaining the sample from QU, the objectives and significance of the current research were clearly explained to the administrative staff at both the Deanship of Admission and Registration, the PYP Office and the CBE Admission Office. The researcher assured these entities that the data would be used solely for the purposes of this scientific study or related publications. No personal information, such as names or ages, was extracted from the database. Access to the data was restricted to the researcher and the research supervisors throughout the analysis phase of this research. The data were provided to the researcher from an official QU email account in the form of an Excel spreadsheet.

5.8.1.3 Data Preparation for Analysis

Data preparation is a vital phase in the data analysis process, particularly before data are employed in regression analyses. This stage involves a series of essential steps designed to ensure the data are clean, accurate and suitable for modelling. Initially, upon receiving an Excel sheet containing comprehensive data in the form of students' final marks in the PYP courses and the first nine core courses of their first year, as well as their overall GPA

at the end of the degree program—as well as their gender—from the Deanship of Admission and Registration, PYP Office and CBE Admission Office at QU, the researcher initiated a detailed analysis. To broaden the scope of the investigation and enhance the precision of the analysis, the researcher calculated both the PYPGPA and the FYGPA.

Consistent with the grading system of QU, which operates on a scale with a maximum of 5, a parallel method was adopted for GPA calculation. This involved converting each course's marks out of 100 into the university's grading scale. The conversion was as follows: a mark ≥95 equates to a 5; 90–94.99 to a 4.75; 85–89.99 to a 4.5; 80–84.99 to a 4; 75–79.99 to a 3.5; (70–74.99 to a 3; 65–69.99 to a 2.5; 60–64.99 to a 2; and <60 to a 1.

Subsequently, the researcher proceeded to calculate the average for each course in both the PYP and the nine core courses to derive the PYPGPA and FYGPA. This meticulous approach was crucial to ensure that the analysis adhered to QU's academic standards and provided reliable insights into students' academic performance. Gender was coded as male = 1 and female = 0 and moderator variables based on gender were created by calculating each of the explanatory variables*Gender.

5.8.1.4 Statistical Approach to Analysing the Data from Qassim University

Two separate regression analyses were conducted to explore the predictive validity of various variables for academic success. Initially, linear regression (univariate) analyses were performed individually for HSGPA, GAT and AT along with gender to assess their singular predictive capabilities for predicting student academic performance. Similarly, in the second model, the PYP courses (QUN 001, QUN 002 & SKL 001) and PYPGPA, along with gender, were examined as explanatory variables to evaluate their influence on academic performance. According to Maxwell et al. (2018), univariate linear regression is a key component of understanding the fundamental relationships among variables before proceeding to more complex models.

To gain insight into the collective predictive strength of these variables, multiple regression analyses were undertaken. The use of multiple regression expands this analysis by enabling the inclusion of two or more independent variables. This is essential in research contexts where multiple factors are expected to influence the outcome

simultaneously. As a result, confounding variables can be controlled, thereby providing a more accurate estimate of the relationship between the variables of interest. Cohen et al. (2003) demonstrated that multiple regression analysis is a powerful tool for analysing the effect of multiple predictors on a single outcome. Using multiple regression analysis, researchers can identify each predictor's unique contribution while holding the other predictors constant. In this research, these analyses included HSGPA, GAT and AT, together with gender. In addition, PYP courses and GPA (QUN 001, QUN 002, SKL 001 & PYPGPA) were evaluated alongside gender in the second model, serving as explanatory variables. This methodology was designed to investigate the extent to which these admission criteria and PYP, both individually and collectively, could predict student performance and academic success. The adoption of these models aligns with the related literature on predicting academic performance (see Sections 3.2.4 & 3.5.5 for more).

Tied to the above, this research adopted gender as a moderator. Moderation analysis aims to 'measure and test the differential effect of the independent variable on the dependent variable as a function of the moderator' (Baron & Kenny, 1986, p. 1174). A moderating variable is one that 'influences the nature (e.g., magnitude and/or direction) of the effect of an antecedent on an outcome' (Aguinis et al., 2017, p. 2). An analysis of a simple moderation effect can be conducted by creating a moderated regression model that explains whether a moderator modifies the strength or direction of an antecedent's relationship with an outcome (Andersson et al., 2014; Baron & Kenny, 1986).

In statistical terms, moderation is the way in which the relationship between an independent variable and a dependent variable changes as a result of the moderator variable's value (Dawson, 2014). Moderator effects are best detected (i.e., tests have a greater power) when the relationship between the predictor and outcome is strong (Chaplin, 1991; Jaccard et al., 1990). However, there are times when moderators are examined when there are unexpectedly weak relationships between a predictor and outcome (Baron & Kenny, 1986; Chaplin, 1991), which contributes to the low power of many tests of interactions. According to Jaccard and Wan (1995), one method of enhancing power is to include additional significant predictors of the outcome variable as covariates in the model.

Figure 5.1 shows a dependent variable (Y), independent variables (X) and a moderator (Gender). Moderating variables are connected to dependent and independent variables by

arrows that indicate the relationship between X and Y. However, the statistical visualisation differs from how it is conceptualised in the model because it includes an interaction term represented by X*Gender (Z).

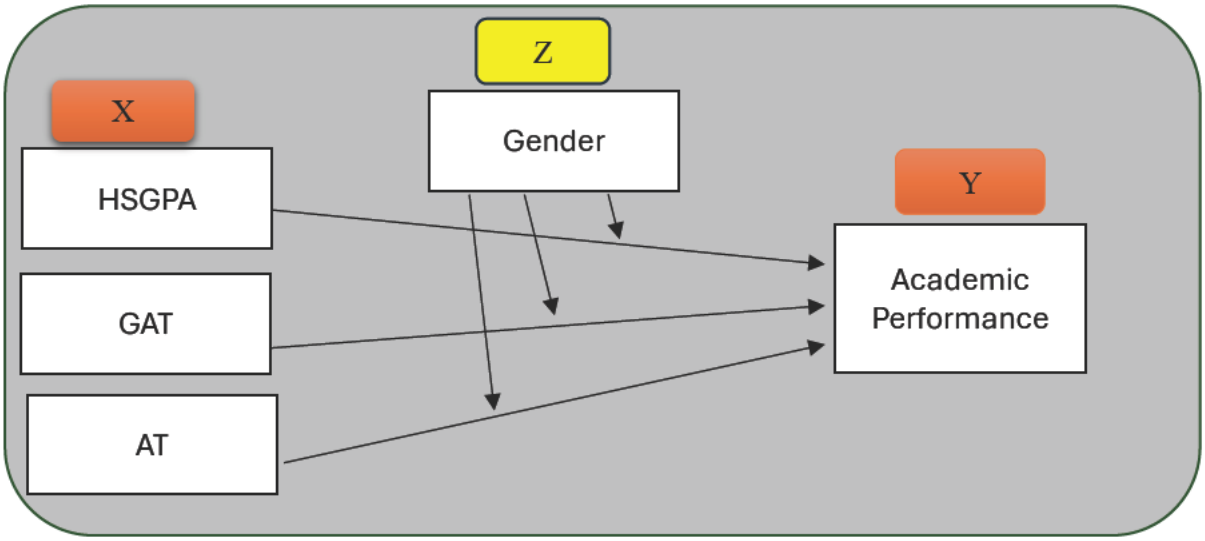

Figure 5.1: Moderator variable

5.8.1.4.1 The First Model

- Univariate Regression

In the first test as shown in Figure 4.4, the researcher seeks to determine if there is relationship between one of the predictor variables (HSGPA, GAT & AT) along with gender, and one dependent variable (PYP [courses & GPA], first-year core courses, FYGPA & overall GPA). Therefore, this research applies univariate linear regression (univariate in the sense that only one of HSGPA, GAT or AT appears in the model—the term is not used in its strict sense in that all 'univariate' models will also include gender and an appropriate cross-product variable) to investigate the relative predictive power of academic performance if each admission criterion was used in isolation.

The model equation is:

$$\boldsymbol{\Upsilon = \alpha + \beta_1 X + \beta_2 \text{Gender} + \beta_3 \text{X} * \text{Gender} + \varepsilon_i,}$$

where $\boldsymbol{\Upsilon}$ = the dependent variable (PYP courses & GPA, first-year core courses, FYGPA & overall GPA); α = the y-intercept (value of y when all other parameters are set to 0; β = slope (the

coefficient of the regression); X = the main explanatory variable (HSGPA, GAT & AT); and $\varepsilon_{i,}$ is the error (residual).

- Multiple Regression

In addition to the first model, the researcher seeks to determine if there are relationships between multiple predictor variables (GPA, GAT & AT) along with gender and one dependent variable (PYP courses & GPA, first-year core courses, FYGPA & overall GPA). Therefore, this research applies multiple regression to test if each variable has any explanatory power above and beyond the other variables, and if so how much.

The model equation is:

$$\boldsymbol{Y = \alpha + \beta_1 HSGPA + \beta_2 GAT + \beta_3 AT + \beta_4 Gender + \beta_5 Gender * HSGPA + \beta_6 Gender * GAT + \beta_7 Gender * AT + \varepsilon_{i,}}$$

where $\boldsymbol{Y}$ = the dependent variable (cumulative scores of PYP courses & GPA, first-year core courses, FYGPA & overall GPA); α = the y-intercept (value of y when all other parameters are set to 0); β_1 to β_7 = slope (the regression of the coefficient); HSGPA, GAT, AT and Gender are the main explanatory variables; and $\varepsilon_{i,}$ = the model error (residual).

5.8.1.4.2 The Second Model

- Univariate Regression

In the second test as shown in Figure 4.4, the researcher seeks to determine if there is a relationship between one of the predictor variables (QUN 001, QUN 002, SKL 001 & PYPGPA) along with gender, and one dependent variable (first-year core courses, FYGPA & overall GPA). Therefore, this research applies univariate linear regression (univariate in the sense that only one of QUN 001, QUN 002, SKL 001 or PYPGPA appears in the model) to investigate the relative predictive power of academic success if each of PYP courses and PYPGPA were used in isolation.

The model equation is:

$$\boldsymbol{Y = \alpha + \beta_1 X + \beta_2 Gender + \beta_3 X * Gender + \varepsilon_{i,}}$$

where $\boldsymbol{Y}$ = the dependent variable (first-year core courses, FYGPA & overall GPA); α = the y-intercept (value of y when all other parameters are set to 0); β = slope (the coefficient of the regression); X = the main explanatory variable (QUN 001, QUN 002, SKL 001 & PYPGPA); and $\varepsilon_{i,}$ = the error (residual).

- Multiple Regression

In the second model, the researcher in addition seeks to determine if there are relationships between multiple predictor variables (QUN 001, QUN 002, SKL 001 & PYPGPA) along with gender and one dependent variable (first-year core courses, FYGPA & overall GPA). Therefore, this research applies multiple regression to test if each variable has explanatory power above and beyond the other variables, and if so how much:

The model equation is:

$$\boldsymbol{Y = \alpha + \beta_1 QUN\ 001 + \beta_2 QUN\ 002 + \beta_3 SKL\ 001 + \beta_4 PYPGPA + \beta_4 Gender + \beta_5 Gender * QUN\ 001 + \beta_6 Gender * QUN\ 002 + \beta_7 Gender * SKL\ 001 + \beta_8 Gender * PYPGPA + \varepsilon_{i,}}$$

where $\boldsymbol{Y}$ = the dependent variable (cumulative scores of first-year core courses, FYGPA & overall GPA); α = the y-intercept (value of y when all other parameters are set to 0); $\beta_1\ to\ \beta_8$ = slope (the regression of the coefficient); QUN 001, QUN 002, SKL 001, PYPGPA and Gender are the main explanatory variables; and $\varepsilon_{i,}$ = the model error (residual).

5.8.2 IELTS's Impact on King Saud Accounting Students' Relative Performance

One of the objectives of this research is to quantify the impact of English language proficiency as measured by IELTS score as an admission criterion on relative performance in MC- versus LC-oriented accounting courses in contexts of EMI in the accounting discipline. The study follows the post-positivist approach, which allows a researcher to harness quantitative methods using secondary data analysis. This approach has been employed in previous accounting studies exploring similar phenomena (King et al., 2021; Yang & Farley, 2019).

Academic results were collected from the Department of Accounting in the CBA at KSU. The study tracks the same group of students from the Master of Accounting program instructed in English for Saudi students who are EFL learners. The sample for this study specifically included Saudi students (n = 44) who had submitted their IELTS scores as part of the enrolment process and had successfully completed all four accounting specialisation subjects in the period 2016–21 (i.e., five school years). The researcher follows Yang and Farley (2019) by categorising the courses into two groups: MC- and LC-oriented courses (see Section 1.6 for an explanation of MC *v*. LC). This criterion was essential to ensure that the sample consisted of students with adequate English language proficiency and academic performance in accounting, thus providing valuable insights for the study. Notably, the distribution of MC and LC courses in this study was consistent across academic years, which indicates that the study controlled for any potential improvement in English language proficiency between Year 1 and Year 2 because it used the LC courses as the control group for expected performance in MC.

5.8.2.1 Language Level and MC/LC (Independent Variables)

5.8.2.1.1 IELTS Score

The IELTS exam evaluates an individual's abilities in reading, listening, writing and speaking English (https://ielts.org). The test contains listening, reading and writing sections that must be completed in a single day (Arcuino, 2013). Although the speaking section can also be scheduled for the same day, some countries may allow up to seven days for this activity. The exam includes various question formats including short-answer and multiple-choice questions, diagram labelling, matching and classification questions. Scores for IELTS are determined on a band from 1 to 9, with each component of the test receiving a separate score. After averaging these scores, a band score is derived, which is presented in half-band increments (Arcuino, 2013; https://ielts.org).

5.8.2.1.2 Less Conceptual

1. Advanced Studies in Financial Reporting

   This course covers fundamental accounting principles, focussing on factors influencing financial reporting, earning management and off-balance-sheet financing. It also examines earning quality, comprehensive income and earning volatility.

2. Studies in Zakat and Tax

   This course covers the principles of *zakat* and tax accounting for business enterprises, as well as the reasons for the differences between accounting and *zakat* and tax income.

5.8.2.1.3 More Conceptual

3. Studies in Auditing and Professional Services

   This course covers some of the theory, practice, and procedures of auditing as they pertain to typical financial audits, special investigations and assurance services.

4. Research Project in Accounting

   This course covers a research project to be completed by the student, focussing on a recent accounting research topic and incorporating basic accounting research elements. During the course, the student learns the fundamentals of accounting research and selects an approach for the project's preparation under the supervision of a department faculty member.

Studies have examined the impact of EMI on MC versus LC for accounting students (King et al., 2021; Yang & Farley 2019). This research categorises language proficiency based on IELTS scores. Specifically, the data are categorised into three IELTS levels (5.5, 6.0 & 6.5). With this approach, it can be determined whether incremental differences of 0.5 in IELTS scores result in significant changes in academic performance or if larger differences are needed to produce notable results. This approach aims to determine whether academic outcomes are sensitive to small changes in English language proficiency as measured by the IELTS. Finally, the researcher categorises courses as LC or MC according to CLT studies (King et al., 2021; Yang & Farley 2019) indicating that students face difficulties when learning in a language that is not their first language, especially for MC subjects, which demand more reading and comprehension from the student.

5.8.2.2 Students' Mean Ranks and Marks (the Dependent Variable)

Following Yang and Farley (2019), the researcher collected marks and applied ranks as dependent variables. These mean results include rankings, providing an alternative approach like ranking students within each course (as used in this analysis with a rank of 1 given to the best-performing student). Yang and Farley (2019) argued that when

aggregating course results for research, grading variances should be considered. Therefore, to assess the impact of mark distributions in individual courses, the analysis here is also done using ranks, with reference to two independent variables language level (IELTS) & LC/MC.

Regarding the procedures for obtaining the sample from KSU, the objectives and significance of the current research were clearly communicated to the department director. The researcher also ensured that the data would be used exclusively for the purposes of this scientific study or related publications. No personal information, such as names or ages, was retrieved from the database. Access to the data was limited to the researcher and the research supervisors throughout the analysis phase of this study. The data were provided to the researcher via KSU's official email account in the form of an Excel spreadsheet.

5.8.2.3 Data Preparation for Analysis

For the master degree, the data received contained the IELTS score for each student and a final mark for each of the four courses. To prepare the data for analysis according to the objective of this research, the researcher categorised the courses as follows: Studies in Auditing and Professional Service, and Research Project in Accounting as MC; and Advanced Studies in Financial Reporting, and Studies in Zakat and Tax as LC. Then, the researcher calculated the mean result (final marks) of each MC versus LC course. Further, following Yang and Farley (2019), the researcher collected marks and applied ranks as dependent variables. This study employs the same approach as Yang and Farley (2019), in using the mean result with ranks which is rather some alternative such as rank in each course (as used in this analysis with a rank of 1 given to the best-performing student). To avoid any impact of mark distributions differing between individual courses, comparisons were made with ranks, with reference to two independent variables (language level & LC/MC).

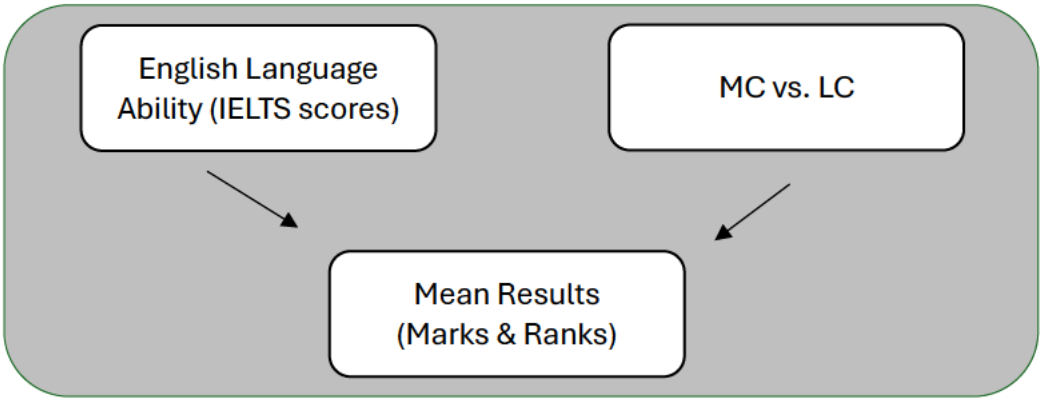

Figure 5.2: Data categories

5.8.2.4 Statistical Approach to Analysis of the Data from King Saud University

Two separate analyses were conducted to identify if a two-way interaction effect exists between language proficiency measured by IELTS (5.5, 6.0 & 6.5) and MC/LC (i.e., the two independent variables) in explaining the mean results of the students. Therefore, an ANOVA test was applied to support the main aim of this study. The assumptions of a two-way ANOVA model are as follows:

- The dependent variable is measured at a continuous level (mean ranks and marks).
- The two independent variables each consist of two categories and are independent groups (language level & MC/LC).

This research adopted a crossover design approach, aligning with the methodology used by Yang and Farley (2019) to address potential research limitations. They suggested using a crossover repeated measures design to account for variation in WM and academic skills, while excluding the effects of linguistic differences. This allows for a meaningful comparison of student performance in MC versus LC courses.

Moreover, a multiple pairwise compression (MPC) method, specifically Tukey's and Scheffé's methods of multiple comparisons for pairwise contrasts, was used. Games (1971) stated that Tukey's (1953) MPC is widely used to compare pairwise group means while the Scheffé (1953) method is a method for performing simultaneous, joint pairwise comparisons for all possible pairwise combinations of the mean of each group. MPC is employed when there is a statistically significant mean difference or a particular difference between groups (Lee & Lee, 2018).

The null hypothesis is rejected following ANOVA if we have three groups and do not know how one group differs from another. Lee and Lee (2018) stated that ANOVA alone does not provide sufficiently detailed information regarding differences among various combinations of groups. Thus, an additional analysis was conducted to clarify the differences between particular pairs of the groups. This research uses SPSS ver. 29 for data analysis and the options to run Tukey and Scheffé tests were adopted to achieve a more comprehensive outcome, as will be shown in Chapter 6.

5.8.2.5 Description of the Variables

5.8.2.5.1 Independent Variables

Three factors are applied (language & MC/LC):

- English language proficiency is measured by IELTS levels categorised as 5.5, 6.0 and 6.5
- Courses = MC/LC courses.

5.8.2.5.2 Dependent Variable

The mean results are based on students' marks and ranks. The model equation is:

$$\boldsymbol{Y_{ijl} = \mu + \alpha_i + \beta_j + (\delta)_{ij} + \epsilon_{ijl}}$$

where Y_{ijl} = mean results (marks & ranks) for student l, the dependent variable; $\mu =$ overall mean; α_i = changes in the mean due to the language level factor with j = 1–2; β_j = change in the mean due to the MC/LC factor with k = 1–2; $(\delta)_{ij}$ = changes in the mean due to the two-way interaction between language level and LC/MC with i = 1–2 and j = 1–2; $\alpha_i + \beta_j$ = the main effect of factors; $(\delta)_{ij}$ = the two-way interaction; and ϵ_{ijl} = the residuals.

Table 5.1: Summary of the variables involved in this research

	Variable	Description
Admission criteria for undergraduate (QU)		
	HSGPA	High School Grade Point Average as reported by the college (out of 100)
	GAT	General Aptitude Test (out of 100)
	AT	Achievement Test (out of 100)
	Gender	Male = 1 & Female = 0
PYP		Preparatory Year Program specialised for Business College Students
	QUN 001	Basic Mathematics course in PYP
	QUN 002	Basic Statistics course in PYP
	SKL 001	Academic Skills course in PYP
	PYPGPA	PYPGPA (out of 5)
First-year core courses in accounting		
	BUS 111	Principles of Management and Organisation
	MATH 111	Mathematics in Social Science I
	MIS 110	Introduction to Technology
	ECON 110	Principles of Microeconomics
	ACCT 120	Principles of Financial Accounting
	ECON 120	Principles of Macroeconomics
	MATH 122	Mathematics in Social Science II
	MKTG 120	Principles of Marketing
	STATA 124	Business Statistics 1
Students' first-year & overall GPA		
	FYGPA	First Year Grade Point Average of first-year core courses (out of 5)
	Overall GPA	Students' overall Grade Point Average at the end of the degree (out of 5)
Admission criteria for graduates in accounting (KSU)		
	IELTS	English language measurement (band 1–9)
Students' performance in MC *v*. LC courses		LC & MC refer to whether the result is for LC or MC courses, respectively

5.9 Summary

This chapter delved into the methodology used in this research, with a primary focus on examining how current admission criteria relate to the academic performance of accounting students in Saudi Arabia. It began by exploring the chosen research paradigm, design and strategy, which forms the basis for the research. Further, the chapter discussed in detail the variables used in this research. It also outlined the population from which secondary data were gathered, ensuring a robust basis for analysis. Finally, the statistical methods employed to test the research hypotheses were discussed, illustrating the comprehensive approach adopted in this research.

Chapter 6 will present a description and statistical analysis of the results.

Chapter 6: Empirical Results

6.1 Introduction

The objective of this research is to analyse how well current admission criteria predict the academic performance of accounting students in Saudi Arabia. The results of the data analysis outlined in Chapter 5 are presented in 28 tables in this chapter.

The findings for the research questions were derived from the database collected, as described in Chapter 5. Data were collected from 608 students enrolled in the BBA program at QU between 2015–16 and 2016–17, and from 44 students enrolled in the Master of Accounting program at KSU between 2016 and 2022. The research questions are as follows:

RQ1: Does the HSGPA predict academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program?

RQ2: Does the GAT score predict academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program?

RQ3: Does the AT score predict academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program?

RQ4: How much explanatory power is lost in predicting academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program if a subset of the current admission criteria is used?

RQ5: Do individual courses in the PYP and the Preparatory Year Program Grade Point Average (PYPGPA) in the CBE predict performance in first-year core courses, the FYGPA and overall GPA in the accounting program?

RQ6: Do any individual courses in the PYP add to or out-perform the PYPGPA in predicting performance in first-year core courses, FYGPA and overall GPA in the accounting program?

RQ7: Does gender moderate the relationships between the HSGPA, GAT and AT and each of the PYP and first-year core courses, FYGPA and overall GPA in the accounting program?

RQ8: Does English language proficiency as measured by the IELTS score of Saudi students affect relative performance in two types of accounting course, more conceptually oriented courses versus less conceptually oriented courses, taught in English?

This chapter is structured as follows. Section 6.2 reports descriptive statistics for the data collected from QU. Section 6.3 reports the results for the admission criteria with regard to predicting academic performance of the BBA students. Section 6.4 reports the analysis of results for the predictive validity of English language proficiency as measured by IELTS on the relative performance of the master of accounting students. Finally, Section 6.5 provides a summary of this chapter.

6.2 Descriptive Statistics

The dataset was analysed using IBM SPSS ver. 29 (IBM, 2013) to provide an overview of the sample, including the gender distribution, admission criteria scores (HSGPA, GAT & AT) and scores in the PYP. This analysis incorporated data from a total of 608 students, covering four cohorts across two academic years: 2015–16 and 2016–17. Each year was comprised of two enrolment periods.

Table 6.1 presents descriptive statistics for HSGPA, GAT and AT scores for 608 students: 324 females and 284 males. As can be seen, female students had a mean HSGPA of 94.1, slightly higher than their male peers' mean of 89.6. There was also a gender difference in GAT scores, with females achieving higher mean scores of 77.08 than males, who averaged 71.8. Additionally, females significantly outperformed males on AT, with a mean score of 74.3 compared to the average of 64.8 for males.

Table 6.1: Distribution of admission criterion scores by gender

Gender	Value of gender variable		HSGPA	GAT	AT
Female	0	Min	78.5	58	60
		Max	100	94	94
		Mean	94.1	77.1	74.3
		N	324	324	324
		Std	4.6	6.3	6.2
Male	1	Min	74.7	57	49
		Max	100	89	84
		Mean	89.6	71.8	64.8
		N	284	284	284
		Std	5.1	5.78	7.0
	Total	Min	74.7	57	49
		Max	100	94	94
		Mean	92.0	74.6	69.8
		N	608	608	608
		Std	5.3	6.6	8.1

Table 6.2a presents the distribution of scores in first-year courses by gender. The average scores for female students in first-year courses ranged between 75 and 84. In contrast, the average scores for male students ranged from 65 to 73. In every course, females outperformed males on average results. Students of both genders generally excelled in MATH 111 and MATH 122. However, in the case of the BUS 111 course, male students recorded lower average scores than in their other first-year courses. In contrast, the pattern of average scores for female students across first-year courses appears more consistent, indicating a stable performance level.

Table 6.2b outlines the variation in the PYP, FYGPA and overall GPA, segregated by gender. It presents PYP course scores (QUN 001, QUN 002 & SKL 001) alongside PYPGPA. The data reveal noticeable differences in mean scores across all PYP components between genders, with males and females scoring higher for SKL 001 than for QUN 001 and QUN 002. Again, females outscored males on average in all courses. This led to females exhibiting a higher PYPGPA than males: mean 3.7 out of 5 for females and 2.9 out of 5 for males. This indicates a significant difference in performance between genders in PYP courses and GPA. Moreover, FYGPA and overall GPA of females were higher than those for males generally. Notably, female students exhibited an increase in

their overall GPA compared to their FYGPA, whereas the pattern was reversed for male students, whose overall GPA was lower than their FYGPA. This trend suggests that female students' performance improved over time, in contrast to that of male students.

Table 6.2a: Distribution of first-year course scores by gender

Gender		BUS 111	MATH 111	MIS 110	ECON 110	ACCT 120	ECON 120	MATH 122	MKTG 120	STAT 124
	Min	60	60	60	60	32	47	48	60	30
	Max	97	100	100	100	99	99	100	97	100
Female	Mean	75.2	84.2	83.7	79.1	75.7	79.4	77.1	76.6	79.7
	N	301	304	303	298	297	298	298	296	299
	Std	9.9	11.3	9.3	10.0	11.8	10.4	12.0	9.8	12.1
	Min	12	18	10	17	4	28	15	17	14
	Max	92	97	96	95	95	100	98	95	100
Male	Mean	65	73	72	68	68	73	71	69	69
	N	221	216	226	225	197	197	188	206	198
	Std	10.6	12.3	10.6	12.4	15.4	11.0	12.5	12.6	15.8
	Mean	70.7	79.6	78.8	74.4	72.8	76.8	74.7	73.5	75.5
Total	*N*	522	520	529	523	494	495	486	502	497
	Std	11.5	12.9	11.4	12.4	13.8	11.1	12.6	11.6	14.7

Table 6.2b: Distribution of PYP, FYGPA and overall GPA by gender

Gender		QUN 001	QUN 002	SKL001	PYPGPA	FYGPA	Overall GPA
Female	Min	23.0	33.0	61.0	1.0	2.0	1.8
	Max	100.0	99.0	100.0	5.0	5.0	5.0
	Mean	77.8	76.5	91.7	3.7	3.7	3.9
	N	313	313	295	324	292	324
	Std	12.5	11.9	7.1	1.0	0.7	0.7
Male	Min	23	23	60	1.0	2.0	1.0
	Max	96	97	99	5.0	5.0	4.8
	Mean	67.4	66.2	83.6	2.9	3.1	2.6
	N	278	277	227	284	180	284
	Std	14.2	14.7	9.3	1.1	0.6	1.0
Total	Mean	72.9	71.6	88.2	3.4	3.5	3.3
	N	591	590	522	608	472	608
	Std	14.3	14.2	9.1	1.1	0.8	1.1

6.3 Analysing Admission Criteria and Academic Performance of Bachelor of Accounting Students

To analyse the admission criteria as outlined in Section 5.8.1, this research employs both univariate regression and multiple regression analyses to answer the research questions and test the study hypotheses (Sections 4.4.1, 4.4.2 & 4.4.3). Detailed results from the data analysis are presented in the following sections. RQ1, 2, 3, 4 and 7 are addressed by examining HSGPA, GAT, AT and gender. For each independent variable, a univariate regression analysis is performed separately, and for all variables together, a multiple regression analysis is conducted. To address RQ5, 6 and 7, the study examines the impact of PYP courses (QUN 001, QUN 002 & SKL 001) as well as PYPGPA. Similar to the methodological approach used to analyse the admission criteria, both univariate and multiple regression analyses are conducted to determine if PYP courses and PYPGPA predict the later-year academic performance of accounting students.

6.3.1 Univariate Regression of HSGPA, Gender and HSGPA*Gender

To provide evidence related to RQ1 and RQ7, a series of univariate regression analyses was conducted to test the related hypotheses (Sections 4.4.1 & 4.4.3). The dependent variable was results for either PYP courses, PYPGPA, first-year core courses, FYAGPA or overall GPA. The results of these models are shown in Tables 6.3a and 6.3b and are based on the following regression equation:

$$Y = \alpha + \beta_1 HSGPA + \beta_2 Gender + \beta_3\, HSGPA * Gender + \varepsilon_{i,} \qquad (1)$$

Table 6.3a shows that HSGPA was a significant predictor of first-year course performance is in every case. The significance of gender varied, with only five courses (BUS 111, MIS 110, ECON 120, MATH 122 & MKTG 120) showing significant gender-related differences. Gender was related to a significant difference in the slope of the relationship for all five, and to a significant difference in the intercept for four of the five courses (all but BUS 111). The R-squared ranged between 14% and 34% with an average of 25% in explaining the variance in results in first-year courses.

Table 6.3b confirms the results of the previous analysis; that is, HSGPA was a significant predictor of academic performance. Regarding gender, its significance varied, with only three variable (QUN 002, PYPGPA & FYGPA) showing significant gender-related

differences. For FYGPA, gender was related to a significant difference in the intercept, and in the slope for two variables (QUN 002 & PYPGPA). Moreover, as indicated by the R-squared values for PYP performance, these variables accounted for 23–30% with an average 26% of the variance in PYP results. For FYGPA and overall GPA, the explanatory power increased, with R-squared values ranging from 35% to 47% with an average 41%, indicating a stronger predictive ability of these models.

Table 6.3a: Univariate results for HSGPA, Gender and HSGPA*Gender for first-year courses

Dependent variables	BUS 111	MATH 111	MIS 110	ECON 110	ACCT 120	ECON 120	MATH 122	MKTG 120	STAT 124
Independent variables									
Constant	−16.9	−19.9	−1.00	−13.8	−15.0	−20.0	−23.3	−9.1	−32.5
	(−1.45)	(−1.52)	(−0.09)	(−1.09)	(−0.94)	(−1.64)	(−1.62)	(−0.70)	(−2.06)*
HSGPA	0.98	1.10	0.90	0.98	0.96	1.05	1.06	0.91	1.19
	(7.89)**	(7.95)**	(7.58)**	(7.31)**	(5.71)**	(8.14)**	(7.00)**	(6.58)**	(7.11)**
Gender	30.6	25.0	32.1	20.1	28.0	49.6	62.0	37.8	14.5
	(1.87)	(1.35)	(2.05)*	(1.13)	(1.22)	(2.81)**	(2.89)**	(2.05)*	(0.64)
HSGPA*Gender	−0.41	−0.35	−0.44	−0.30	−0.35	−0.58	−0.71	−0.46	−0.23
	(−2.33)*	(−1.75)	(−2.61)**	(−1.57)	(−1.40)	(−3.01)**	(−3.07)**	(−2.31)*	(−0.93)
R-squared	0.32	0.30	0.34	0.30	0.14	0.21	0.15	0.19	0.25
Adjusted R-squared	0.32	0.30	0.34	0.30	0.14	0.20	0.15	0.18	0.24
F statistic	81.5	74.2	89.7	75.3	27.5	42.8	29.2	38.8	54.3
No. of observations	522	520	529	523	494	495	486	502	497

*Represents coefficient significant at the 5% level. **Represents coefficient significant at the 1% level.

Table 6.3b: Univariate results for HSGPA, Gender and HSGPA*Gender for PYP, FYGPA and overall GPA

Dependent variables	QUN 001	QUN 002	SKL 001	PYPGPA	FYGPA	Overall GPA
Independent variables						
Constant	−29.9	−39.2	25.8	−6.1	−4.4	−3.4
	(−2.02)*	(−2.70)**	(2.69)**	(−5.50)**	(−5.80)**	(−3.73)**
HSGPA	1.14	1.23	0.70	0.10	0.09	0.08
	(7.30)**	(7.97)**	(6.90)**	(8.89)**	(10.66)**	(8.09)**
Gender	30.77	33.18	12.05	2.84	3.55	−1.04
	(1.56)	(1.71)	(0.92)	(1.89)	(3.06)**	(−0.86)
HSGPA*Gender	−0.402	−0.423	−0.191	−0.036	−0.043	0.001
	(−1.87)	(−2.01)*	(−1.35)	(−2.20)*	(−3.40)**	(0.10)
R-squared	0.23	0.25	0.30	0.27	0.35	0.47
Adjusted R-squared	0.23	0.25	0.30	0.27	0.35	0.46
F statistic	59.8	65.5	73.9	75.8	84.5	175.2
No. of observations	591	590	522	608	472	608

*Represents coefficient significant at the 5% level, **Represents coefficient significant at the 1% level.

6.3.2 Univariate Regression of GAT, Gender and GAT*Gender

To provide evidence related to RQ2 and RQ7, a series of univariate regression analyses was conducted to test the related hypotheses (Sections 4.4.1 & 4.4.3). The dependent variable was results for either PYP courses, PYPGPA, first-year core courses, FYAGPA or overall GPA. The results of these models are shown in Tables 6.4a and 6.4b and are based on the following regression equations:

$$Y = \alpha + \beta_1 GAT + \beta_2 Gender + \beta_3\ GAT * Gender + \varepsilon_{i,} \quad (2)$$

The results in Table 6.4a indicate that GAT scores significantly predicted performance for all first-year courses with the exception of MIS 110, where the prediction was not statistically significant. In addition, the results indicate that gender was not a significant factor. According to the R-squared values, the variation in first-year course performance explained by these variables ranged from 8% to 25% with an average of 16%.

Table 6.4a: Univariate results for GAT, Gender and GAT*Gender for first-year courses

Dependent variables	BUS 111	MATH 111	MIS 110	ECON 110	ACCT 120	ECON 120	MATH 122	MKTG 120	STAT 124
Independent variables									
Constant	43.7	67.3	80.9	61.4	45.5	51.4	49.2	51.1	51.7
	(6.21)**	(8.26)**	(11.67)**	(7.59)**	(4.79)**	(6.91)**	(5.66)**	(6.52)**	(5.42)**
GAT	0.41	0.22	0.04	0.23	0.39	0.36	0.36	0.33	0.36
	(4.48)**	(2.07)*	(0.40)	(2.19)*	(3.19)**	(3.76)**	(3.22)**	(3.25)**	(2.94)**
Gender	4.47	3.58	−3.62	−9.39	−8.84	8.33	13.48	−17.79	12.41
	(0.40)	(0.28)	(−0.33)	(−0.76)	(−0.58)	(0.70)	(0.97)	(−1.45)	(0.81)
GAT*Gender	−0.18	−0.19	−0.11	−0.01	0.04	−0.18	−0.25	0.16	−0.30
	(−1.23)	(−1.09)	(−0.73)	(−0.05)	(0.22)	(−1.14)	(−1.34)	(0.99)	(−1.43)
R-squared	0.25	0.19	0.25	0.21	0.10	0.11	0.08	0.15	0.14
Adjusted R-squared	0.24	0.18	0.25	0.20	0.09	0.11	0.08	0.14	0.14
F statistic	56.8	39.2	58.2	45.7	18.1	20.3	14.2	28.4	27.3
No. of observations	522	520	529	523	494	495	486	502	497

*Represents coefficient significant at the 5% level. **Represents coefficient significant at the 1% level.

Table 6.4b demonstrates that GAT scores were a significant predictor of academic performance across the majority of modules, with the exception of QUN 001, where the result was not statistically significant. Unlike the results presented in Table 6.4a, gender effects were variable, with statistical significance being observed for only QUN 001, QUN 002 and overall GPA. For these three variables, gender was related to a significant difference in the intercept of the relationship, and in the slope for two of the three variables (QUN 001 & QUN 002). In addition, as indicated by the R-squared values for PYP performance, these variables explained 16–23% of the variance, with an average of 19%, indicating moderate explanatory power. For FYGPA and overall GPA, the models exhibited enhanced predictive power, as evidenced by R-squared values ranging from 20% to 37% with average 28%.

Table 6.4b Univariate results for GAT, Gender and GAT*Gender for PYP, FYGPA and overall GPA

Dependent variables	QUN 001	QUN 002	SKL 001	PYPGPA	FYGPA	Overall GPA
Independent variables						
Constant	67.9	55.1	72.1	0.55	1.7	2.3
	(7.09)**	(5.85)**	(12.18)**	(0.79)	(3.55)**	(4.06)**
GAT	0.13	0.28	0.25	0.415	0.02	0.02
	(1.03)	(2.27)*	(3.32)**	(4.55)**	(3.82)**	(2.62)**
Gender	−40.05	−37.09	−9.98	−1.135	0.21	−2.77
	(−2.89)**	(−2.72)**	(−1.11)	(−1.09)	(0.25)	(−3.20)**
GAT*Gender	0.42	0.40	0.04	0.007	−0.01	0.02
	(2.28)*	(2.16)*	(0.35)	(0.52)	(−0.91)	(1.92)
R-squared	0.16	0.17	0.23	0.18	0.20	0.37
Adjusted R-squared	0.15	0.17	0.23	0.18	0.19	0.37
F statistic	35.9	40.3	52.06	47.06	37.8	119.6
No. of observations	591	590	522	608	472	608

*Represents coefficient significant at the 5% level. **Represents coefficient significant at the 1% level.

6.3.3 Univariate Regression of AT, Gender and AT*Gender

To provide evidence related to RQ3 and RQ7, a series of univariate regression analyses was conducted to test the related hypotheses (Sections 4.4.1 & 4.4.3). The dependent variable was results for either PYP courses, PYPGPA, first-year core courses, FYAGPA

or overall GPA. The results of these models are shown in Tables 6.5a and 6.5b and are based on the following regression equations:

$$Y = \alpha + \beta_1 AT + \beta_2 Gender + \beta_3\ AT * Gender + \varepsilon_{i,} \qquad (3)$$

In Table 6.5a, the results for the predictive power of AT for academic performance across first-year courses are similar to those observed for HSGPA, with statistical significance achieved across all variables considered. Regarding gender, its significance varied, with only five courses (BUS 111, ACT 120, ECON 120, MATH 122 & STAT 124) showing significant gender-related differences. Gender was related to a significant difference in the slope of the relationship for all five, and to a significant difference in the intercept for three of the five courses (BUS 111, ECON 120 & MATH 122). Further, the R-squared values, which indicate the models' explanatory power, ranged from 13% to 30%, averaging 22% when accounting for variance in first-year course performance.

In Table 6.5b, findings corroborate those from the preceding analyses, showing that AT outcomes were significant predictors of academic performance in the PYP, FYGPA and overall GPA. Regarding gender, its significance varied, with only two variables (FYGPA & overall GPA) showing significant gender-related differences. In both variables gender was related to a significant difference in the intercept of the relationship, and in the slope but only for FYGPA (not overall GPA). According to the R-squared values for PYP performance, these variables explained between 21% and 29% of the variance (average 26%). With regard to FYGPA and overall GPA, the models demonstrated greater explanatory power, as evidenced by R-squared values ranging from 29% to 41%, with an average of 35%.

Table 6.5a: Univariate results for AT, Gender and AT*Gender for first-year courses

Dependent variables	BUS 111	MATH 111	MIS 110	ECON 110	ACCT 120	ECON 120	MATH 122	MKTG 120	STAT 124
Independent variables									
Constant	25.03	32.7	64.4	42.6	28.2	30.3	13.1	38.2	18.04
	(3.79)**	(4.36)**	(9.72)**	(5.76)**	(3.15)**	(4.31)**	(1.66)	(5.15)**	(2.03)*
AT	0.67	0.69	0.26	0.49	0.64	0.66	0.86	0.51	0.83
	(7.62)**	(6.89)**	(2.92)**	(4.95)**	(5.32)**	(6.99)**	(8.15)**	(5.20)**	(6.95)**
Gender	19.8	6.2	−6.5	−10.9	22.9	39.4	43.6	6.9	22.9
	(2.19)*	(0.60)	(−0.72)	(−1.09)	(1.83)	(3.99)**	(3.90)**	(0.67)	(1.83)
AT*Gender	−0.38	−0.17	−0.04	0.06	−0.38	−0.61	−0.65	−0.15	−0.40
	(−2.93)**	(−1.17)	(−0.31)	(0.43)	(−2.12)*	(−4.35)**	(−4.07)**	(−1.05)	(−2.27)*
R-squared	0.30	0.28	0.27	0.27	0.13	0.16	0.18	0.17	0.22
Adjusted R-squared	0.30	0.27	0.26	0.27	0.12	0.16	0.17	0.16	0.22
F statistic	75.7	66.1	64.2	64.8	23.4	32.3	35.0	33.4	46.4
No. of observations	522	520	529	523	494	495	486	502	497

*Represents coefficient significant at the 5% level. **Represents coefficient significant at the 1% level.

Table 6.5b: Univariate results for AT, Gender and AT*Gender for PYP, FYGPA and overall GPA

Dependent variables	QUN 001	QUN 002	SKL 001	PYPGPA	FYGPA	Overall GPA
Independent variables						
Constant	35.18	23.70	56.17	−1.01	−0.05	1.28
	(4.02)**	(2.80)**	(10.53)**	(−1.69)	(−0.11)	(2.32)*
AT	0.57	0.71	0.48	0.07	0.05	0.04
	(4.88)**	(6.25)**	(6.69)**	(7.47)**	(8.44)**	(4.77)**
Gender	−13.39	−11.52	1.57	−0.91	1.51	−1.86
	(−1.19)	(−1.06)	(0.22)	(−0.11)	(2.39)*	(−2.59)**
AT*Gender	0.131	0.124	−0.084	−0.002	−0.026	0.014
	(0.82)	(0.80)	(−0.83)	(−0.17)	(−2.9)**	(1.40)
R-squared	0.21	0.25	0.29	0.27	0.29	0.41
Adjusted R-squared	0.21	0.25	0.29	0.26	0.28	0.40
F statistic	55.06	68.6	73.8	75.1	64.7	141.4
No. of observations	591	590	522	608	472	608

*Represents coefficient significant at the 5% level. **Represents coefficient significant at the 1% level.

6.3.4 Multivariate Regression of HSGPA, GAT, AT and Gender

To evaluate the incremental predictive power of the variables under consideration, multiple regression analyses were conducted. Using multiple regression analysis facilitates the examination of the impact of two or more independent variables at the same time. Using this approach is crucial in a research context where a variety of variables may simultaneously influence the outcome variable. Accordingly, this research conducted a multiple regression analysis using the variables HSGPA, GAT, AT outcomes, gender, and their interaction effects (HSGPA*Gender, GAT*Gender & AT*Gender) to predict academic performance. In accordance with the methodology employed in univariate analyses, this section examines whether relationships exist between multiple predictor variables (HSGPA, GAT & AT) and gender, as well as a single dependent variable. This includes performance in PYP courses, PYPGPA, first-year courses, FYGPA and overall GPA. The results from these models are shown in Tables 6.6a and 6.6b and are based on the following regression equation:

$$Y = \alpha + \beta_1 HSGPA + \beta_2 GAT + \beta_3 AT + \beta_4 Gender + \beta_5 HSGPA * Gender + \beta_6 GAT * Gender + \beta_7 AT * Gender + \varepsilon_{i,} \quad (4)$$

Table 6.6a presents the results for the incremental predictive power of HSGPA, GAT and AT on academic performance across first-year courses. As demonstrated in the findings, HSGPA and AT had significant incremental predictive power for academic performance in these courses, emphasising their importance as predictors of academic performance. However, GAT's incremental predictive power was generally not significant, except for BUS 111. The significance of gender varied, with only six courses (BUS 111, MATH 111, MIS 110, ACT 120, ECON 120 & MATH 122) showing significant gender-related differences. In these six courses, gender was related to a difference in the intercept of the relationship in five of six courses (significant for all but ACT 120). Regarding significant differences in slope, the factors varied among HSGPA, GAT and AT. For HSGPA, only MIS 110, ECON 120 and MATH 122 results showed a significant difference in slope. AT showed a significant difference in slope for only BUS 111, ACCT 120, ECON 120 and MATH 122. However, GAT was not significant in slope. Additionally, the R-squared values, which indicate the models' explanatory power, ranged from 19% to 39%, averaging 24% when accounting for variance in first-year course performance.

Table 6.6b presents the results for the incremental predictive power of HSGPA, GAT and AT on academic performance across PYP, FYGPA and overall GPA. As demonstrated in the findings, HSGPA and AT showed significant incremental predictive power for academic performance in these courses, emphasising their importance as predictors of academic performance. However, in line with earlier findings regarding first-year course performance in Table 6.6a, GAT remained largely insignificant. Gender's significance varied, with only five variables (QUN 001, QUN 002, PYPGPA, FYGPA & overall GPA) showing significant gender-related differences. Gender was related to a significant difference in the intercept of the relationship for two of these five variables (FYGPA & overall GPA), while regarding significant difference in the slope are varied among HSGPA, GAT and AT. For HSGPA, only QUN 001, QUN 002, PYPGPA and FYGPA indicated significant slope. In contrast, for AT, only FYGPA showed a significant slope. However, the slope for GAT was not significant. According to the R-squared values for PYP performance, these variables explained between 30% and 38% of the variance, on average 35%. With regard to FYGPA and overall GPA, the models demonstrated greater

explanatory power, as evidenced by R-squared values ranging from 43% to 52%, with an average of 48%.

Table 6.6a: Multivariate results for HSGPA, GAT, AT, Gender, HSGPA*Gender, GAT*Gender and AT*Gender for first-year courses

Dependent variables	BUS 111	MATH 111	MIS 110	ECON 110	ACCT 120	ECON 120	MATH 122	MKTG 120	STAT 124
Independent variables									
Constant	−54.07	−44.2	−3.7	−36.9	−50.1	−50.8	−62.9	−37.2	−67.8
	(−4.26)**	(−3.10)**	(−0.29)	(−2.57)*	(−2.83)**	(−3.81)**	(−4.02)**	(−2.58)*	(−3.95)**
HSGPA	0.81	0.94	0.86	0.89	0.81	0.89	0.85	0.79	0.98
	(6.75)**	(6.90)**	(7.11)**	(6.65)**	(4.82)**	(6.92)**	(5.76)**	(5.78)**	(5.96)**
GAT	0.22	−0.02	−0.06	0.10	0.20	0.15	0.09	0.18	0.08
	(2.48)*	(−0.15)	(−0.69)	(1.02)	(1.65)	(1.60)	(0.81)	(1.80)	(0.64)
AT	0.48	0.55	0.15	0.33	0.45	0.47	0.71	0.34	0.66
	(5.34)**	(5.39)**	(1.62)	(3.27)**	(3.64)**	(4.88)**	(6.42)**	(3.34)**	(5.36)**
Gender	49.7	42.3	37.6	22.3	29.4	67.9	93.5	29.6	42.4
	(2.69)**	(2.01)*	(2.02)*	(1.09)	(1.10)	(3.39)**	(3.94)**	(1.40)	(1.65)
HSGPA*Gender	−0.29	−0.31	−0.46	−0.31	−0.19	−0.38	−0.54	−0.39	−0.11
	(−1.71)	(−1.59)	(−2.68)**	(−1.66)	(−0.78)	(−2.01)*	(−2.42)*	(−1.95)	(−0.45)
GAT*Gender	−0.07	−0.20	−0.11	−0.11	0.23	0.09	−0.08	0.23	−0.19
	(−0.51)	(−1.20)	(−0.77)	(−0.70)	(1.09)	(0.56)	(−0.41)	(1.35)	(−0.91)
AT*Gender	−0.30	−0.04	0.08	0.15	−0.43	−0.58	−0.54	−0.18	−0.30
	(−2.26)*	(−0.23)	(0.61)	(1.05)	(−2.24)*	(−3.94)**	(−3.13)**	(−1.18)	(−1.62)
R-squared	0.39	0.37	0.35	0.35	0.19	0.27	0.24	0.25	0.31
Adjusted R-squared	0.38	0.36	0.34	0.34	0.18	0.25	0.23	0.24	0.30
F statistic	46.5	42.2	39.9	40.0	16.8	25.1	21.4	23.2	31.1
No. of observations	522	520	529	523	494	495	486	502	497

*Represents coefficient significant at the 5% level. **Represents coefficient significant at the 1% level.

Table 6.6b: Multivariate results for HSGPA, GAT, AT, Gender, HSGPA*Gender, GAT*Gender and AT*Gender for PYP, FYGPA and overall GPA

Dependent variables	QUN 001	QUN 002	SKL 001	PYPGPA	FYGPA	Overall GPA
Independent variables						
Constant	−50.5	−73.4	−1.3	−9.8	−6.9	−5.07
	(−2.99)**	(−4.54)**	(−0.12)	(−8.22)**	(−8.33)**	(−5.09)**
HSGPA	1.03	1.09	0.59	0.09	0.08	0.07
	(6.72)**	(7.43)**	(6.07)**	(8.12)**	(9.69)**	(7.57)**
GAT	−0.01	0.11	0.13	0.02	0.01	0.01
	(−0.10)	(0.94)	(1.84)	(2.81)**	(1.67)	(1.47)
AT	0.43	0.52	0.36	0.04	0.04	0.02
	(3.60)**	(4.57)**	(4.94)**	(4.87)**	(6.42)**	(2.82)**
Gender	10.7	18.2	13.9	2.7	4.8	−2.8
	(0.46)	(0.83)	(0.93)	(1.59)	(3.79)**	(−1.98)*
HSGPA*Gender	−0.42	−0.44	−0.15	−0.03	−0.04	0.002
	(−1.99)*	(−2.18)*	(−1.06)	(−2.04)*	(−3.01)**	(0.19)
GAT*Gender	0.26	0.20	0.032	0.0004	−0.005	0.018
	(1.39)	(1.12)	(0.27)	(0.03)	(−0.49)	(1.55)
AT*Gender	0.10	0.11	−0.08	0.00	−0.02	0.01
	(0.59)	(0.67)	(−0.71)	(0.30)	(−2.07)*	(0.86)
R-squared	0.30	0.35	0.38	0.38	0.43	0.52
Adjusted R-squared	0.29	0.34	0.37	0.37	0.43	0.51
F statistic	35.4	44.8	44.3	52.7	50.8	91.9
No. of observations	591	590	522	608	472	608

*Represents coefficient significant at the 5% level. **Represents coefficient significant at the 1% level.

The following sections provide evidence related to RQ4 about ranking of HSGPA, GAT and AT.

6.3.4.1 Comparison of R-Squared among the Variables

The R-squared values from the univariate analyses of the main explanatory variables (HSGPA, GAT & AT) in relation to academic performance were examined address RQ4. Table 6.7 presents the R-squared values for all dependent variables against these explanatory variables. As shown, HSGPA consistently had the highest explanatory power among other admission criteria if used as a single admission criterion, with the exception of MATH 122 where AT performed better. In all courses, GAT exhibited the least explanatory power of the three criteria if used alone, which shows its limited value in predicting academic performance. Based on this comparison, it is evident that each admission criterion differed in their ability to predict academic performance if used as the sole criterion.

Table 6.7: Comparison of R-squared values for univariate analysis of the main criteria

Independent variables	HSGPA	GAT	AT
Dependent variables			
BUS 111	0.32	0.25	0.30
MATH 111	0.30	0.19	0.28
MIS 110	0.34	0.25	0.27
ECON 110	0.30	0.21	0.27
ACCT 120	0.14	0.10	0.13
ECON 120	0.21	0.11	0.16
MATH 122	0.15	0.08	0.18
MSKTG 120	0.19	0.15	0.17
STAT 124	0.25	0.14	0.22
QUN 001	0.23	0.16	0.22
QUN 002	0.25	0.17	0.26
SKL 001	0.3	0.23	0.3
PYPGPA	0.27	0.18	0.27
FYGPA	0.35	0.20	0.29
Overall GPA	0.47	0.37	0.41

6.3.4.2 Incremental R-Squared among Main Variables in the Multivariate Regression

To address RQ4, a comparative analysis of incremental R-squared values in the multivariate analysis was conducted by sequentially excluding one among the main variables HSGPA, GAT and AT in separate regression analyses. This approach sheds light on each variable's unique incremental contribution to predicting academic performance, highlighting the differential impact of excluding a specific criterion. The analysis, therefore, elucidates the relative importance of HSGPA, GAT and AT in predicting academic performance when all criteria are considered for admission. Table 6.8 shows that excluding HSGPA resulted in the most significant loss in predictive accuracy, indicating its crucial importance among admission criteria. In contrast, removing GAT had negligible effects, suggesting its minimal contribution to the prediction model. Further, excluding AT had a moderate impact, underscoring its importance but to a lesser extent than HSGPA. This comprehensive examination increases our understanding of the incremental contribution of each admission criterion to academic performance prediction.

Table 6.8: Incremental R-squared among the main variables

Independent variables	HSGPA, GAT & AT	AT	GAT	HSGPA
Dependent variables				
BUS 111	0.39	0.04	0.01	0.08
MATH 111	0.37	0.06	0.01	0.09
MIS 110	0.35	0.01	0	0.08
ECON 110	0.35	0.04	0	0.08
ACCT 120	0.19	0.02	0.01	0.05
ECON 120	0.27	0.04	0.01	0.1
MATH 122	0.24	0.07	0	0.06
MSKTG 120	0.25	0.02	0.02	0.07
STAT 124	0.31	0.05	0	0.09
QUN 001	0.3	0.04	0.01	0.08
QUN 002	0.35	0.06	0.01	0.09
SKL 001	0.38	0.05	0.01	0.08
PYPGPA	0.38	0.05	0.01	0.1
FYGPA	0.43	0.06	0	0.13
Overall GPA	0.52	0.02	0.01	0.1
Average incremental R-squared		0.042	0.007	0.085

6.3.5 Univariate Regression of PYP, PYPGPA and Gender

To provide evidence related to RQ5 and RQ7, a series of univariate regression analyses was conducted to test the related hypotheses (Sections 4.4.2 & 4.4.3). The dependent variable was results for either first-year core courses, FYGPA or overall GPA.

*6.3.5.1 Univariate Regression of QUN 001, Gender and QUN 001*Gender*

The first course of the PYP is QNU 001. The results for this model are shown in Table 6.9 and are based on the following regression equation:

$$Y = \alpha + \beta_1 QUN\ 001 + \beta_2 Gender + \beta_3\ QUN\ 001 * Gender + \varepsilon_{i,} \qquad (5)$$

Table 6.9 presents an analysis of QUN 001's predictive power for academic performance across first-year courses, FYGPA and overall GPA. The findings reveal that QUN 001 was a significant predictor of academic performance across all these variables at the 1% significance level. This emphasises its important role in predicting academic performance. The significance of gender varied, with only four variables (BUS 111, MATH 122, STAT 124 & overall GPA) showing significant gender-related differences: gender was related to a significant difference in the slope of the relationship for all four variables, and to a significant difference in the intercept for two of the four variables (MATH 122 & overall GPA). The R-squared values, reflecting the model's ability to explain variation in academic performance, ranged from 19% to 41%, averaging 27% for first-year course performance. The models provided greater insight into FYGPA and overall GPA, with R-squared values ranging from 42% to 53% and average explanatory power of 46%.

*6.3.5.2 Univariate Regression of QUN 002, Gender and QUN 002*Gender*

The second course of the PYP is QNU 002. The results for this model are shown in Table 6.10 and are based on the following regression equation:

$$Y = \alpha + \beta_1 QUN\ 002 + \beta_2 Gender + \beta_3\ QUN\ 002 * Gender + \varepsilon_{i,} \quad (6)$$

Table 6.10 presents the analysis of QUN 002's predictive power for academic performance across first-year courses, FYGPA and overall GPA. Incorporating QUN 001's findings, Table 6.10 indicates that QUN 002 was a significant predictor of academic

performance across all these variables at the 1% significance level. This emphasises its important role in predicting academic performance. The significance of gender varied, with only six variables (BUS 111, ECON 120, MATH 122, STAT 124, FYGPA & overall GPA) showing significant gender-related differences. Gender was related to a significant difference in the slope of the relationship for all six variables, and to a significant difference in the intercept for four of the six (ECON 120, MATH 122, FYGPA & overall GPA). The R-squared values, reflecting the model's ability to explain variation in academic performance, ranged from 26% to 51%, averaging 35% for first-year course performance. However, the models provided greater insight into FYGPA and overall GPA, with R-squared values ranging from 55% to 61% and average explanatory power of 58%.

*6.3.5.3 Univariate Regression of SKL 001, Gender and SKL 001*Gender*

The third course of the PYP is SKL 001. The results for this model are shown in Table 6.11 and are based on the following regression equation:

$$Y = \alpha + \beta_1 \text{SKL } 001 + \beta_2 Gender + \beta_3 \text{ SKL } 001 * Gender + \varepsilon_{i,} \quad (7)$$

Table 6.11 presents the analysis of SKL 001's predictive power on academic performance across first-year courses, FYGPA and overall GPA. Incorporating the QUN 001 and QUN 002 findings, Table 6.11 indicates that SKL 001 was a significant predictor of academic performance across all variables at the 1% significance level. This underlines its significant role in predicting academic performance. All variables showed significant gender-related differences: gender was related to a significant difference in the slope of the relationship, and to a significant difference in the intercept, but only for BUS 111, MATH 111, ECON 120, MATH 122, STAT 124 and FYGPA. However, no significant gender-related differences were found for MKTG 120, either in the intercept or slope. The R-squared values, reflecting the model's ability to explain variation in academic performance, ranged from 15% to 35%, averaging 26% for first-year course performance. However, the models provided greater insight into FYGPA and overall GPA, with R-squared values ranging from 37% to 44% and average explanatory power of 40%.

*6.3.5.4 Univariate Regression of PYPGPA, Gender and PYPGPA*Gender*

PYPGPA is the last explanatory variable used to test the power of PYP to predict accounting academic performance. The results of this model are shown in Table 6.12 and are based on the following regression equations:

$$Y = \alpha + \beta_1 \text{PYPGPA} + \beta_2 Gender + \beta_3 \text{ PYPGPA} * Gender + \varepsilon_{i,} \quad (8)$$

Table 6.12 presents the analysis of PYPGPA's predictive power for academic performance across first-year courses, FYGPA and overall GPA. Incorporating findings for QUN 001, QUN 002 and SKL 001, Table 6.12 shows that PYPGPA was a significant predictor of academic performance across all these variables at the 1% significance level. This emphasises its significant role in predicting academic performance. In terms of gender, its significance varied, with only six variables (MATH 111, MIS 110, ECON 110, MATH 122, FYGPA & overall GPA) showing significant gender-related differences. Gender was found to have a significant impact on the slope of the relationship in only three of the six variables: MATH 122, FYGPA, and overall GPA. However, gender was related to a significant difference in the intercept for five of these six variables (all but FYGPA). The R-squared values, reflecting the model's ability to explain variation in academic performance, ranged from 19% to 40%, averaging 29% for first-year course performance. The models provided greater insight into FYGPA and overall GPA, with R-squared values ranging from 48% to 57% and average explanatory power of 49%.

Table 6.9: Univariate Regression of QUN 001, Gender, QUN 001*Gender for First Year Courses, FYGPA, and Overall GPA

Dependent variables	BUS 111	MATH 111	MIS 110	ECON 110	ACCT 120	ECON 120	MATH 122	MKTG 120	STAT 124	FYGPA	Overall GPA
Independent variables											
Constant	44.00	31.59	50.10	37.59	34.77	46.58	28.77	41.47	35.56	0.39	1.68
	(10.11)**	(7.06)**	(12.37)**	(8.37)**	(6.15)**	(10.26)**	(5.69)**	(8.83)**	(6.02)**	(1.48)	(6.30)**
QUN 001	0.39	0.66	0.42	0.52	0.52	0.41	0.61	0.44	0.56	0.04	0.03
	(7.20)**	(11.87)**	(8.38)**	(9.31)**	(7.30)**	(7.29)**	(9.63)**	(7.55)**	(7.57)**	(12.78)**	(8.48)**
Gender	9.22	−4.33	−4.84	−4.05	1.30	8.01	28.93	5.96	13.11	0.32	−1.67
	(1.28)	(−0.58)	(−0.73)	(−0.55)	(0.13)	(1.04)	(3.24)**	(0.75)	(1.29)	(0.69)	(−4.85)**
QUN 001*Gender	−0.24	−0.03	−0.05	−0.05	−0.07	−0.16	−0.43	−0.15	−0.28	−0.01	0.01
	(−2.48)*	(−0.33)	(−0.59)	(−0.48)	(−0.56)	(−1.59)	(−3.63)**	(−1.38)	(−2.06)*	(−1.48)	(2.21)*
R-squared	0.29	0.41	0.37	0.35	0.19	0.19	0.22	0.21	0.23	0.42	0.53
Adj R-squared	0.28	0.41	0.37	0.35	0.18	0.18	0.21	0.21	0.23	0.41	0.52
F	68.1	117.8	100.5	91.4	36.9	37.3	44.0	43.7	48.1	110.4	217.1
No. of observations	509	503	513	513	483	483	474	492	484	466	591

*Represents coefficient significant at the 5% level. **Represents coefficient significant at the 1% level.

Table 6.10: Univariate regression of QUN 002, Gender and QUN 002*Gender for first-year courses, FYGPA and overall GPA

Dependent variables	BUS 111	MATH 111	MIS 110	ECON 110	ACCT 120	ECON 120	MATH 122	MKTG 120	STAT 124	FYGPA	Overall GPA
Independent variables											
Constant	33.1	23.7	43.7	30.6	28.3	35.2	18.3	30.0	24.2	−0.4	1.1
	(7.96)**	(5.72)**	(11.06)**	(7.29)**	(5.17)**	(8.03)**	(3.74)**	(6.80)**	(4.25)**	(−1.87)	(4.47)**
QUN002	0.54	0.78	0.51	0.62	0.61	0.57	0.75	0.60	0.71	0.05	0.04
	(10.16)**	(14.76)**	(10.23)**	(11.64)**	(8.73)**	(10.16)**	(12.11)**	(10.63)**	(9.84)**	(17.9)**	(11.18)**
Gender	7.85	−6.15	−1.53	−11.59	−7.67	15.85	36.60	2.19	16.18	0.86	−1.48
	(1.21)	(−0.94)	(−0.25)	(−1.78)	(−0.87)	(2.23)*	(4.47)**	(0.31)	(1.73)	(2.19)*	(−4.68)**
QUN002*Gender	−0.21	−0.01	−0.09	0.06	0.05	−0.27	−0.54	−0.09	−0.32	−0.02	0.01
	(−2.43)*	(−0.06)	(−1.15)	(0.71)	(0.43)	(−2.82)**	(−4.92)**	(−0.94)	(−2.57)*	(−3.18)**	(2.00)*
R-squared	0.37	0.51	0.42	0.45	0.26	0.27	0.29	0.32	0.30	0.55	0.61
Adj R-squared	0.36	0.51	0.42	0.44	0.26	0.26	0.29	0.32	0.29	0.55	0.60
F statistic	97.6	174.4	121.9	137.3	56.2	58.1	63.9	77.3	67.2	186.8	299.7
No. of observations	508	502	512	512	482	482	473	491	483	465	590

*Represents coefficient significant at the 5% level. **Represents coefficient significant at the 1% level.

Table 6.11: Univariate regression of SKL 001, Gender and SKL 001*Gender for first-year courses, FYGPA and overall GPA

Dependent variables	BUS 111	MATH 111	MIS 110	ECON 110	ACCT 120	ECON 120	MATH 122	MKTG 120	STAT 124	FYGPA	Overall GPA
Independent variables											
Constant	12.4	12.7	33.9	15.5	16.6	22.1	8.4	22.6	6.4	−1.6	−0.99
	(1.77)	(1.57)	(4.82)**	(2.02)*	(1.70)	(2.89)**	(0.96)	(2.84)**	(0.65)	(−3.39)**	(−1.84)
SKL001	0.7	0.8	0.5	0.7	0.6	0.6	0.7	0.6	0.8	0.1	0.1
	(8.95)**	(8.84)**	(7.11)**	(8.30)**	(6.06)**	(7.50)**	(7.82)**	(6.79)**	(7.39)**	(11.49)**	(9.20)**
Gender	23	25.5	15.9	15.8	21.9	30.5	50.4	15.8	34.6	2.8	1.1
	(2.55)*	(2.43)*	(1.76)	(1.61)	(1.70)	(3.00)**	(4.26)**	(1.52)	(2.64)**	(4.48)**	(1.54)
SKL001*Gender	−0.34	−0.37	−0.28	−0.25	−0.29	−0.38	−0.61	−0.22	−0.47	−0.04	−0.02
	(−3.30)**	(−3.08)**	(−2.71)**	(−2.29)*	(−1.99)*	(−3.35)**	(−4.55)**	(−1.91)	(−3.16)**	(−5.05)**	(−2.55)*
R-squared	0.35	0.32	0.34	0.33	0.15	0.19	0.17	0.21	0.23	0.37	0.44
Adj R-squared	0.34	0.32	0.34	0.33	0.15	0.19	0.16	0.21	0.23	0.37	0.43
F Statistic	90.5	80.6	88.1	85.8	29.5	38.3	32.3	43.8	49.2	91.4	133.7
No. of observations	514	509	519	518	487	486	477	496	487	468	522

*Represents coefficient significant at the 5% level. **Represents coefficient significant at the 1% level.

Table 6.12: Univariate regression of PYPGPA, Gender, PYPGPA*Gender for first-year courses, FYGPA and overall GPA

Dependent variables	BUS 111	MATH 111	MIS 110	ECON 110	ACCT 120	ECON 120	MATH 122	MKTG 120	STAT 124	FYGPA	Overall GPA
Independent variables											
Constant	56.4	55.3	64.0	52.1	51.7	57.7	49.5	52.1	51.9	1.2	2.6
	(21.05)**	(20.77)**	(26.03)**	(17.73)**	(14.42)**	(20.61)**	(15.60)**	(17.66)**	(15.11)**	(6.94)**	(17.48)**
PYPGPA	4.8	7.4	5.03	6.8	6.1	5.5	7.03	6.2	7.1	0.63	0.35
	(7.19)**	(11.09)**	(8.18)**	(9.39)**	(6.84)**	(7.91)**	(8.88)**	(8.49)**	(8.31)**	(14.89)**	(9.22)**
Gender	-5.6	-9.3	-7.9	-9.4	-6.2	3.9	13.4	-3.8	0.4	0.4	-1.7
	(-1.35)	(-2.22)*	(-2.09)*	(-2.18)*	(-1.10)	(0.87)	(2.60)**	(-0.83)	(0.08)	(1.57)	(-8.70)**
PYPGPA*Gender	-0.72	0.66	-0.21	0.73	0.63	-2.18	-4.73	-0.12	-2.22	-0.20	0.24
	(-0.64)	(0.57)	(-0.20)	(0.62)	(0.41)	(-1.80)	(-3.39)**	(-0.10)	(-1.42)	(-2.83)**	(4.37)**
R-squared	0.31	0.40	0.37	0.38	0.19	0.20	0.20	0.26	0.25	0.48	0.57
Adj R-squared	0.30	0.40	0.37	0.38	0.19	0.20	0.19	0.26	0.25	0.47	0.57
F statistic	77.1	116.9	102.4	107.03	38.9	41.3	39.8	59.8	55.7	141.2	264.6
No. of observations	522	520	529	523	494	495	486	502	497	472	608

*Represents coefficient significant at the 5% level. **Represents coefficient significant at the 1% level.

To provide evidence related to whether any individual courses in the PYP add to or outperform the explanatory power of PYPGPA in predicting academic performance, Sections 6.3.5.5 and 6.3.5.6 address RQ6 along with RQ7, as discussed in the following sections.

6.3.5.5 Comparison of R-squared among the Variables

To answer the first part of RQ6 about the performance of PYP variables, a comparative analysis of R-squared values for PYP courses (QUN 001, QUN 002 & SKL 001) and PYPGPA is presented in Table 6.13, emphasising the differences in predictive power among these variables. A consistent high R-squared value for QUN 002 demonstrates that it was the best predictor of academic performance across multiple dependent variables. This is followed by PYPGPA, which, while strong in most courses and noteworthy as a predictor of FYGPA and overall GPA, slightly trailed behind QUN 002. It is noteworthy that QUN 001 performed particularly well in MATH 111, maintaining high average R-squared values in spite of not surpassing QUN 002 or PYPGPA in terms of overall performance. SKL 001 demonstrated the least predictive capacity, with the lowest R-squared values among these variables.

Table 6.13: Comparison of R-squared values in univariate analyses among PYP courses and PYPGPA

Independent variables Dependent variables	QUN 001	QUN 002	SKL 001	PYPGPA
BUS 111	0.29	0.37	0.35	0.31
MATH 111	0.41	0.51	0.32	0.40
MIS 110	0.37	0.42	0.34	0.37
ECON 110	0.35	0.45	0.33	0.38
ACCT 120	0.19	0.26	0.15	0.19
ECON 120	0.19	0.27	0.19	0.20
MATH 122	0.22	0.29	0.17	0.20
MSKTG 120	0.21	0.32	0.21	0.26
STAT 124	0.23	0.30	0.23	0.25
FYGPA	0.42	0.55	0.37	0.48
Overall GPA	0.53	0.61	0.44	0.57

The results of the comparison indicate that each variable in the PYP had a varying impact on predicting academic performance, with QUN 002 being the most important predictor and SKL 001 being the least important predictor if used alone.

*6.3.5.6 Multivariate Regression of QUN 001, QUN 002, SKL 001, PYPGPA, Gender, QUN 001*Gender, QUN 002*Gender, SKL 001*Gender and PYPGPA*Gender*

For the purpose of evaluating the predictive power of the variables under consideration and helping address RQ6 and RQ7, multiple regression analyses were conducted. Multiple regression analysis allows for the comprehensive examination of the effects of several independent variables on an outcome variable. It is particularly useful in research contexts where multiple variables may affect the dependent variable simultaneously. Accordingly, this research conducted a multiple regression analysis using the variables QUN 001, QUN 002, SKL 001 and PYPGPA outcomes, gender and its interaction effects (QUN 001*Gender, QUN 002*Gender, SKL 001*Gender & PYPGPA*Gender) to predict academic performance. Based on the methodology employed in univariate analyses, this section examines whether relationships exist between multiple predictor variables (QUN 001, QUN 002, SKL 001 & PYPGPA) and gender, as well as a single dependent variable. This includes performance for first-year courses, FYGPA and overall GPA. The results of these models are shown in Table 6.14 and are based on the following regression equation:

$$Y = \alpha + \beta_1 \text{ QUN } 001 + \beta_2 \text{ QUN } 002 + \beta_3 \, SKL \, 001 + \beta_4 \, PYPGPA + \beta_5 \, Gender + \beta_6 QUN \, 001 * Gender + \beta_7 \, QUN \, 002 * Gender + \beta_8 \, SKL \, 001 * Gender + \beta_9 \, PYPGPA * Gender + \varepsilon_{i,} \qquad (9)$$

.

Table 6.14: Multivariate regression of QUN 001, QUN 002, SKL 001, PYPGPA, Gender, QUN 001*Gender, QUN 002*Gender, SKL 001*Gender and PYPGPA*Gender

Dependent variables	BUS 111	MATH 111	MIS 110	ECON 110	ACCT 120	ECON 120	MATH 122	MKTG 120	STAT 124	FYGPA	Overall GPA
Independent variables											
Constant	0.55	45.6	29.3	16.7	−8.4	29.4	20.1	27.4	34.6	−0.36	0.17
	(0.03)	(2.64)**	(1.76)	(0.95)	(−0.36)	(1.55)	(0.94)	(1.44)	(1.41)	(−0.36)	(0.14)
QUN001	0.045	−0.193	0.085	0.064	0.313	−0.139	−0.076	−0.106	−0.270	−0.011	−0.004
	(0.27)	(−1.15)	(0.53)	(0.38)	(1.37)	(−0.76)	(−0.37)	(−0.58)	(−1.14)	(−1.19)	(−0.34)
QUN002	0.52	0.16	0.36	0.34	0.57	0.41	0.42	0.47	0.25	0.03	0.01
	(3.12)**	(0.94)	(2.24)*	(1.98)*	(2.47)*	(2.21)*	(2.03)*	(2.55)*	(1.04)	(2.84)**	(1.23)
SKL001	0.47	−0.11	0.21	0.24	0.42	0.18	0.08	0.11	0.06	0.01	0.01
	(2.81)**	(−0.66)	(1.30)	(1.42)	(1.85)	(0.98)	(0.39)	(0.61)	(0.26)	(0.98)	(0.89)
PYPGPA	−3.15	12.94	0.02	2.19	−5.83	3.25	5.80	2.68	10.45	0.50	0.51
	(−0.63)	(2.59)**	(0.00)	(0.43)	(−0.85)	(0.59)	(0.94)	(0.49)	(1.48)	(1.77)	(1.47)
Gender	35.83	−50.20	26.55	−40.77	−33.33	15.66	23.71	−4.81	14.00	−1.26	0.46
	(1.21)	(−1.67)	(0.93)	(−1.36)	(−0.81)	(0.47)	(0.61)	(−0.15)	(0.32)	(−0.69)	(0.23)
QUN001*Gender	−0.27	0.35	−0.18	0.12	0.05	0.15	0.15	−0.06	0.06	0.03	−0.03
	(−0.99)	(1.27)	(−0.69)	(0.44)	(0.12)	(0.48)	(0.40)	(−0.21)	(0.15)	(1.76)	(−1.36)
QUN002*Gender	−0.26	0.58	−0.28	0.56	0.54	−0.25	−0.19	0.03	−0.16	0.01	0.02
	(−0.94)	(2.06)*	(−1.07)	(2.01)*	(1.39)	(−0.80)	(−0.53)	(0.11)	(−0.38)	(0.49)	(0.88)
SKL001*Gender	−0.24	0.37	−0.27	0.26	0.21	−0.05	0.05	0.13	0.02	0.01	−0.01
	(−0.92)	(1.39)	(−1.06)	(0.99)	(0.59)	(−0.18)	(0.14)	(0.46)	(0.05)	(0.76)	(−0.43)

Dependent variables	BUS 111	MATH 111	MIS 110	ECON 110	ACCT 120	ECON 120	MATH 122	MKTG 120	STAT 124	FYGPA	Overall GPA
PYPGPA*Gender	5.13	−15.59	6.65	−10.48	−8.49	−1.74	−7.33	−2.18	−4.05	−0.80	0.09
	(0.65)	(−1.94)	(0.87)	(−1.30)	(−0.77)	(−0.20)	(−0.70)	(−0.25)	(−0.35)	(−1.65)	(0.16)
R-squared	0.41	0.54	0.44	0.48	0.28	0.29	0.30	0.35	0.32	0.58	0.58
Adj R-squared	0.40	0.53	0.43	0.47	0.27	0.27	0.29	0.33	0.31	0.57	0.57
F statistic	38.97	63.7	42.97	50.98	20.6	21.2	22.3	28.3	25.04	70.7	77.7
No. of observations	508	502	512	512	482	482	473	491	483	465	515

*Represents coefficient significant at the 5% level. **Represents coefficient significant at the 1% level.

Table 6.14 presents the results for the incremental predictive power of QUN 001, QUN 002, SKL 001 and PYPGPA for academic performance across first-year courses, FYGPA and overall GPA. According to the findings, only QUN 002 significantly predicted academic performance in these variables beyond the other explanatory variables, emphasising its importance as a predictor of academic performance. In contrast, the other variables (QUN 001, SKL 001 & PYPGPA) did not generally possess significant incremental predictive power. Gender showed no statistically significant differences. Two courses (MATH 111 & ECON 110) had a significant difference in slope in relation to QUN 002. The R-squared values, indicative of the model's explanatory capacity, spanned from 28% to 54% for first-year course performance, with an average of 38%. In terms of FYGPA and overall GPA, the model's explanatory power was more pronounced, with R-squared values reaching 58% for both and an average explanatory power of 58%.

6.4 Analysing the Impact of English Language Proficiency Measured by IELTS on Predicting Relative Performance for the Master of Accounting Students

To analyse the impact of English language ability as measured by IELTS as an admission criterion in the Master of Accounting at KSU as outlined in Section 5.8.2, this research applied a repeated-measures ANOVA test to answer RQ8 (Does English language proficiency as measured by the IELTS score of Saudi students affect relative performance in two types of accounting course, more conceptually oriented courses versus less conceptually oriented courses, taught in English?) and test the hypotheses stated in Section 4.4.4. Detailed results of the data analysis are presented in the following sections. RQ8 is addressed by examining variables such as IELTS and the mean results for MC versus LC courses based on student marks and ranks. Two separate analyses were conducted to seek to determine if a two-way interaction effect exists between language comprehension levels.

Table 6.15: Summary of English Language Groups Based on IELTS Bands Involved in This Analyses

Groups based on IELTS band	Number of students
5.5	13
6.0	17
6.5	14
Total	44

Table 6.15 summarises the number of students in each group based on their IELTS band. The next sections report the raw average marks and ranks for MC versus LC courses across the three IELTS band groups (5.5, 6.0 & 6.5). Statistical analyses were conducted using IBM SPSS ver. 29 (IBM, 2013).

6.4.1 Comparison of Raw Average Marks for MC versus LC across Language Group Based on Student IELTS Band

Table 6.16a summarises between-subject effects for the mean marks, illustrating how different variables contribute to the results. It shows that the model was statistically significant ($p = 0.002$), explaining approximately 21% of the variance in the mean results. There was a significant intercept, indicating that the expected mean result may differ significantly from zero if all predictors are at zero ($p = 0.001$). In terms of individual predictors, IELTS scores were not significantly related to the mean results ($p = 0.87$). Accordingly, the IELTS score alone did not have a significant direct effect on the mean results. However, the MC and LC predictor was significant ($p = 0.001$), indicating that this single predictor explained a substantial amount of variance with the mean results. Further, there was no significant interaction between IELTS and MC/LC ($p = 0.68$), suggesting that the impact of MC/LC did not vary significantly across the various IELTS scores.

Table 6.16a: Test of between-subject effects for mean marks

Dependent variable: Mean results (marks)					
Source	Sum of squares	df	Mean square	F	*p*-value
Corrected model	629.267a	5	125.8	4.2	0.002
Intercept	712405.2	1	712405.2	24031.6	0.001**
IELTS	8.2	2	4.1	0.14	0.87
MCLC	568.8	1	568.8	19.1	0.001**
IELTS * MCLC	22.4	2	11.2	0.37	0.68
Error	2430.8	82	29.6		
Total	724435.7	88			
Corrected total	3060.1	87			
R-squared	0.21				
Adjusted R-squared	0.16				

**Represents coefficient significant at the 1% level.

Table 6.16b shows that comparison of IELTS scores 5.5 and 6.0 revealed a mean difference of 0.45, which indicates that students with an IELTS score of 6.0 scored, on average, 0.45 marks higher than those with an IELTS score of 5.5. However, this difference was not significant ($p = 0.75$). Further, the mean difference between IELTS scores 5.5 and 6.5 was 0.78, which indicates that students with an IELTS score of 6.5 scored, on average, 0.78 marks higher than those with an IELTS score of 5.5. This difference also was not statistically significant ($p = 0.60$). For bands 6.0 and 6.5 of the IELTS, the mean difference of 0.34 indicates that students with an IELTS score of 6.5 scored 0.34 marks higher than those with an IELTS score of 6.0 but this was not statistically significant ($p = 0.81$).

Table 6.16c shows a significant mean difference between LC and MC of −5.117, which indicates that students scored, on average, 5.117 marks lower in LC than in MC courses. This difference was statistically significant ($p = 0.001$).

Table 6.16b: Pairwise comparison of mean marks between IELTS scores

Dependent variable	Mean results (marks)					
(I) IELTS	(J) IELTS	Mean difference (I − J)	Std. error	*p*-value	95% Confidence interval	
					Lower bound	Upper bound
5.5	6.0	0.45	1.42	0.75	−2.4	3.3
5.5	6.5	0.78	1.48	0.6	−2.2	3.7
6.0	6.5	0.34	1.39	0.81	−2.4	3.1

Based on estimated marginal means; [a] adjusted for multiple comparisons; least significant difference (equivalent to no adjustment).

Table 6.16c: Pairwise comparison of mean marks between LC and MC

Dependent variable	Mean results (marks)					
(I) MC/LC	(J) MC/LC	Mean difference (I −J)	Std. error	*p*-value	95% Confidence interval for difference b	
					Lower bound	Upper bound
LC	MC	−5.117*	1.17	0.001**	−7.4	−2.8

*Represents coefficient significant at the 5% level. **Represents coefficient significant at the 1% level.

Table 6.16d: Pairwise comparison of mean marks holding MC/LC constant

Dependent variable		Mean results (marks)			
MC/LC	IELTS (I)	IELTS (J)	Mean difference (I − J)	Std. error	*p*-value
LC	5.5	6.0	−1.65	2.01	0.42
	5.5	6.5	−1.72	2.1	0.41
	6.0	6.5	−0.08	1.97	0.97
MC	5.5	6.0	−0.75	2.01	0.71
	5.5	6.5	−0.16	2.1	0.94
	6.0	6.5	−0.6	1.97	0.76

Table 6.16d presents results for the pairwise comparison of mean marks conducted holding LC and MC constant and varying the IELTS score to test if there were statistically significant changes. The mean result for LC increased by 1.6 points when moving from

IELTS scores of 5.5 to 6.0, and by 1.7 points when moving from IELTS scores 5.5 and 6.5. However, neither of these increases was statistically significant (p = 0.42 & 0.41, respectively). Similarly, the mean result for LC increased by 0.08 when moving from IELTS scores of 6.0 to 6.5; also not significant (p = 0.97).

For MC courses, the mean result increased by 0.75 points when moving from IELTS scores of 5.5 to 6.0, and by 0.16 points when moving from IELTS scores of 5.5 to 6.5. However, neither of these increases was statistically significant (p = 0.71 & 0.94, respectively). Similarly, the mean result for MC increased by 0.6 when moving from IELTS scores of 6.0 to 6.5; also not significant (p = 0.76).

Table 6.16e, the pairwise comparison for the mean marks was conducted where holding the IELTS score constant and varying LC and MC to test if there are statistically significant changes. The mean result for IELTS scores 5.5 increased by 3.6 points when moving from LC to MC, but this difference did not reach statistical significance (p= 0.08). In contrast, the mean result for IELTS scores 6.0 increased by 6.08 points when moving from LC to MC, and it reveals statistically significant (p= 0,002). Similarly, the mean result for IELTS scores 6.5 increased by 5.57 points when moving from LC to MC, and it shows statistically significant (p= 0,008).

Table 6.16e Pairwise comparison of mean marks holding IELTS score constant

Dependent variable	Mean results (marks)		
IELTS Group band	Mean difference LC − MC	Std. error	*p*-value
5.5	-3.69	2.14	0.08
6.0	-6.08	1.87	0.002**
6.5	-5.57	2.06	0.008**

**Represents coefficient significant at the 1% level.

6.4.2 Comparison of Raw Average Ranks for MC versus LC across Language Group Based on the Student's IELTS Band

Table 6.17a summarises between-subject effects for the mean ranks, demonstrating how different variables contributed to the results. It illustrates that the model was not

statistically significant (p = 0.87), explaining approximately 2.1% of the variance in the mean results. There was a significant intercept, indicating that the expected mean result may differ significantly from zero if all predictors are at zero (p = 0.001). In terms of individual predictors, IELTS scores were not significantly related to mean ranks (p = 0.95). Accordingly, the IELTS score alone did not have a significant direct effect on the mean results. Likewise, the MC and LC predictor was not significant (p = 0.95), indicating that this single predictor explained a substantial amount of variance in the mean results. Further, there was no significant interaction between IELTS and MC/LC (p = 0.44), suggesting that the impact of MC/LC did not vary significantly across the various IELTS scores.

In Table 6.17b, the comparison of IELTS scores 5.5 and 6.0 revealed a mean difference of 0.029, which indicates that students with an IELTS score of 6.0 scored, on average, 0.029 ranks higher than those with an IELTS score of 5.5. However, this difference was not significant (p = 0.99). Further, the mean difference between IELTS scores 5.5 and 6.5 was −0.77, which indicates that students with an IELTS score of 5.5 scored, on average, 0.77 ranks higher than those with an IELTS score of 6.5. This difference was not statistically significant (p = 0.79). For bands 6.0 and 6.5 of the IELTS, a mean difference of −0.80, which indicates that students with an IELTS score of 6.0 scored 0.80 ranks higher than those with an IELTS score of 6.5. However, this difference also was not statistically significant (p = 0.77).

Table 6.17c reveals that LC and MC showed a mean difference of 0.14, which indicates that students scored, on average, 0.14 ranks lower on MC compared to LC. This difference is not statistically significant (p = 0.95).

Table 6.17a: Test of between-subject effects for mean rank

Dependent variable	Mean results (ranks)				
Source	Sum of squares	df	Mean square	F	*p*-value
Corrected model	207.009[a]	5	41.4	0.35	0.87
Intercept	50563.59	1	50563.5	433.2	0.001**
IELTS	12.03	2	6.02	0.05	0.95
MCLC	0.43	1	0.43	0.004	0.95
IELTS*MCLC	193.2	2	96.6	0.82	0.44
Error	9570.4	82	116.71		
Total	60934.5	88			
Corrected total	9777.4	87			
R-squared	0.021				
Adj R-squared	−0.039				

**Represents coefficient significant at the 1% level.

Table 6.17b: Pairwise comparison of mean ranks between IELTS scores

Dependent variable	Mean result (ranks)					
(I) IELTS	(J) IELTS	Mean difference (I − J)	Std. error	*p*-value	95% Confidence interval for difference[a]	
					Lower bound	Upper bound
5.5	6.0	0.029	2.815	0.992	−5.57	5.628
5.5	6.5	−0.777	2.942	0.792	−6.63	5.076
6.0	6.5	−0.806	2.757	0.771	−6.291	4.678

Based on estimated marginal means; [a] adjusted for multiple comparisons; least significant difference (equivalent to no adjustment).

Table 6.17c: Pairwise comparison of mean ranks between LC and MC

Dependent variable	Mean results (ranks)					
(I) MC/LC	(J) MC/LC	Mean difference (I − J)	Std. error	*p*-value	95% Confidence interval for difference[a]	
					Lower bound	Upper bound
LC	MC	0.14	2.318	0.952	−4.471	4.751

Table 6.17d: Pairwise comparison of mean ranks holding MC/LC constant

Dependent variable	Mean results (ranks)				
MC/LC	IELTS (I)	IELTS (J)	Mean difference (I − J)	Std. error	*p*-value
LC	5.5	6.0	−2.3	3.9	0.55
	5.5	6.5	−4.5	4.1	0.28
	6.0	6.5	−2.1	3.8	0.57
MC	5.5	6.0	−2.4	3.9	0.54
	5.5	6.5	−2.9	4.1	0.47
	6.0	6.5	−56	3.8	0.88

Table 6.17d presents results for the pairwise comparison of mean ranks holding LC and MC constant and varying the IELTS score to test if there are statistically significant changes. The mean result for LC decreased by 2.3 points when moving from IELTS scores of 5.5 to 6.0, and by 4.5 points when moving from IELTS scores of 5.5 to 6.5. Further to this, the mean result for the LC decreased by 2.1 points when moving from IELTS scores of 6.0 to 6.5. However, none of these shifts was statistically significant (p = 0.55, 0.28 & 0.57, respectively).

Similarly, for MC, the mean result decreased by 2.4 points when moving from IELTS scores of 5.5 to 6.0, and by 2.9 points when moving from IELTS scores of 5.5 to 6.5. Moreover, the mean result for MC decreased by 0.56 points when moving from IELTS scores of 6.0 to 6.5. However, none of these shifts was statistically significant (p = 0.54, 0.47 & 0.88, respectively).

Table 6.17e: Pairwise comparison of mean ranks holding IELTS scores constant

Dependent variable	Mean results (ranks)		
IELTS Group band	Mean difference LC − MC	Std. error	*p*-value
5.5	−3.9	4.2	0.35
6.0	0.8	3.7	0.82
6.5	3.5	4.08	0.38

Table 6.17e presents a pairwise comparison of mean ranks holding the IELTS score constant and varying LC and MC to test if there are statistically significant changes. The mean result for IELTS scores 5.5 increased by 3.9 points when moving from LC to MC, but this difference did not reach statistical significance ($p = 0.35$). The mean result for an IELTS score of 6.0 decreased by 0.8 points when moving from LC to MC but this was not statistically significant ($p = 0.82$). Similarly, the mean result for an IELTS score of 6.5 decreased by 3.5 points when moving from LC to MC, but this was not statistically significant ($p = 0.38$).

6.5 Summary

This chapter detailed the descriptive findings related to the predictive power of admission criteria for academic performance of accounting students in the Saudi Arabian context. There were notable differences between the criteria. Specifically, in the BBA degree, the results showed statistically significant positive correlations between the explanatory variables (HSGPA, GAT & AT) and dependent variables (PYP, first-year core courses, FYGPA and overall GPA) in predicting academic performance. The findings of multiple regressions indicated that HSGPA emerged as the strongest predictor of academic performance, while GAT was identified as the weakest, with most cases showing no significant predictive capability. Additionally, the results consistently implied that the individual courses and GPA of the PYP in the business college had predictive value for subsequent academic performance. However, when running multiple regressions, only QUN 002 was statistically significant; the other predictor variables in the PYP were not. Further, gender, when used as a moderating variable, presented mixed results, with significance in some instances and not in others. However, the pattern of interaction effects was significant, indicating that gender did modify the relationship between

variables. The pattern of the impact of English language proficiency, as measured by IELTS, on relative academic performance was found to be not significant.

Chapter 7 will present a detailed discussion of these results providing theoretical connections and comparing the results of this research with the literature in both a Saudi Arabian and a global context.

Chapter 7: Discussion and Conclusions

7.1 Introduction

This research was motivated by the critical role that effective admission criteria play in predicting academic performance, particularly in the context of Saudi Arabian tertiary education. As Saudi Arabia continues to invest heavily in its education system to realise its Vision 2030, there is an increasing emphasis on identifying and utilising the most reliable predictors of student performance. This thesis fills this gap for accounting education research by addressing five research objectives.

RO1 is to evaluate the predictive validity of the HSGPA and CEEs (GAT & AT) regarding student performance in the PYP focussing on mathematics, statistics and academic skills. RO2 is to evaluate the predictive validity of the HSGPA and CEEs (GAT & AT) regarding student performance in first-year core courses, FYGPA and overall GPA in the accounting program. RO3 is to evaluate how the business college preparatory year predicts performance in first-year core courses, FYGPA and overall GPA in the accounting program. RO4 is to examine whether gender acts as a moderator of the relationships between admission criteria, the PYP and academic performance measured by first-year core course results, FYGPA and overall GPA in the accounting program. Last, RO5 is to evaluate the validity of English language proficiency, as measured by IELTS score, as an admission criterion that predicts relative performance of Saudi Arabian accounting students in MC- versus LC-oriented accounting courses.

This chapter wil review the results presented in Chapter 6 in light of the hypotheses developed in Chapter 4. These hypotheses will then be discussed in the context of the literature reviewed in Chapter 3 and theoretical framework proposed in Chapter 4.

The remainder of this chapter is structured as follows. Section 7.2 discusses the success of HSGPA and CEE (GAT & AT) in predicting accounting academic performance. Section 7.3 examines the influence of the PYP on accounting performance. Section 7.4 explores the role of gender as a moderator in academic performance, while Section 7.5 evaluates the effectiveness of IELTS in predicting relative academic performance among accounting students. Section 7.6 outlines the research contributions and implications.

Section 7.7 addresses the limitations of the study and offers directions for future research. Finally, Section 7.8 concludes the chapter.

7.2 Predictive Power of Admission Criteria for Accounting Academic Performance

RO1 and RO2 aimed to investigate the predictive validity of the admission criteria HSGPA and CEE (GAT & AT) for the academic performance of Saudi accounting students in the bachelor degree. To address these objectives, this study posed the following research questions:

> **RQ1**: Does the HSGPA predict academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program?
>
> **RQ2**: Does the GAT score predict academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program?
>
> **RQ3**: Does the AT score predict academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program?
>
> **RQ4**: How much explanatory power is lost in predicting academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program if a subset of the current admission criteria is used?

7.2.1 Predictive Power of Admission Criteria (HSGPA, GAT & AT) for Performance in PYP, First-year Core Courses, FYGPA and Overall GPA

To answer RQ1–4, this research tested the following two hypotheses:

> **H1:** Each entrance criterion (HSGPA, GAT & AT) is a predictor of academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program.
>
> **H2:** Each entrance criterion predicts academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program above what is predicted by the other two entrance criteria.

In-depth discussion of the results in Tables 6.3a, 6.3b, 6.4a, 6.4b, 6.5a and 6.5b is provided below.

Results in Tables 6.3a and 6.3b indicated that HSGPA was statistically significant in predicting the academic performance in each of the PYP, first-year core courses, FYGPA and overall GPA. The R-squared values for PYP performance accounted for 23–30% (average 26%) of the variance in PYP results. The R-squared vales ranged from 14% to 34% with an average of 25% in relation to explaining the variance in results in first-year courses. For FYGPA and overall GPA, the explanatory power increased, with R-squared values ranging from 35% to 47% (average 41%).

Tables 6.4a and 6.4b show that GAT was statistically significant in predicting academic performance in the PYP, first-year core courses, FYGPA and overall GPA, with the exception of QUN 001 (mathematics in PYP) and MIS 110 (introduction to technology), where the prediction was not statistically significant. The R-squared values for PYP performance accounted for 16–23% (average 19%) of the variance in PYP results, while the R-squared values ranged between 8% and 25% (average 16%) in explaining the variance in results for first-year courses. For FYGPA and overall GPA, the explanatory power increased, with R-squared values ranging from 20% to 37%, with an average 28%.

Tables 6.5a and 6.5b show that AT was statistically significant in predicting academic performance in the PYP, first-year core courses, FYGPA and overall GPA. The R-squared values for PYP performance accounted for 21–29% with an average of 26% in terms of explaining the variance in academic performance in the PYP, wile the R-squared ranged from 13% to 30% (average 22%) in terms of explaining the variance of results in first-year courses. For FYGPA and overall GPA, the explanatory power increased, with R-squared values ranging from 29% to 41% (average 35%).

The above results led to acceptance of H1.

With regard to RQ4, the results in Table 6.7 suggest that HSGPA and AT were almost equivalent in explanatory power. They explained approximately 26% of the variance in PYP course performance and PYPGPA. However, the results show that HSGPA was the most effective predictor of first-year courses, FYGPA and overall GPA while GAT was the least effective predictor in terms of explaining of the variance when used alone.

Therefore, the results in Table 6.7 indicate HSGPA had the most predictive ability across a broad range of academic performance.

Tables 6.6a and 6.6b present the incremental predictive power of these predictors (HSGPA, GAT & AT) on academic performance in the PYP, first-year core courses, FYGPA and overall GPA. The results indicate that both HSGPA and AT showed significant incremental predictive power for academic performance in the PYP, first-year core courses, FYGPA and overall GPA, while GAT remained largely insignificant.

Additionally, this research compared the incremental R-squared values in multivariate analyses by sequentially excluding one among the main variables (HSGPA, GAT or AT) in separate regression analyses. The results in Table 6.8 reveal that excluding HSGPA led to the most significant loss in predictive accuracy, indicating its crucial importance among admission criteria, with an average incremental R-squared of 0.085. The results also show that excluding AT had a moderate impact, underscoring its importance but to a lesser extent than HSGPA with an average incremental R-squared of 0.042. In contrast, removing GAT had negligible effects with an average incremental R-squared of 0.007, suggesting its minimal contribution to the prediction model.

These findings support the argument presented in H2 that HSGPA or AT alone will predict academic performance above what is predicted by the other two entrance criteria; however, they do not support GAT's predictive power above what is predicted by the other two criteria. This leads to H2 being partially supported (see Table 7.1 for a summary of the hypothesis results).

7.2.2 Predictive Power of HSGPA, GAT and AT for Academic Performance in Combined PYP, First-year courses, FYGPA and Overall GPA

Overall, the results show that HSGPA generally was the best predictor by far of academic performance in the PYP, first-year courses, FYGPA and overall GPA. These findings are consistent with those of numerous studies in a variety of countries that have found HSGPA—or its equivalents such as the ATAR—to be the strongest predictor of academic performance. For example, in the USA, Geiser and Santelices (2007) found that HSGPA not only predicted first-year GPA but became more predictive in later years, outperforming CEE scores like the SAT. Similar results reported by Elert (1992), Hood (1992), Geiser and Studley (2002), Niu and Tienda (2010) and Warren and Goins (2019)

who support the conclusion that HSGPA is a stronger predictor of future academic performance than CEEs. In Australia, studies such as McKenzie and Schweitzer (2001), Norton (2016), Anderton (2017) and Russell et al. (2021) confirmed the reliability of the ATAR as a predictor of university performance, with Anderton (2017) showing that ATAR and gender were key predictors of FYGPA. Comparable results have also been reported for Sweden, where Cliffordson (2008) demonstrated that HSGPA had stronger predictive validity than SweSAT, while in Hungary (Molontay & Nagy, 2023; Nagy & Molontay, 2021) found that HSGPA was more reliable than CEE scores. Likewise, Al Hazaa et al. (2021) in Qatar indicated that that higher HSGPA scores were associated with a significantly reduced likelihood of receiving D, F or withdrawal grades.

In addition, in the context of Saudi Arabia, these findings are consistent with those of previous similar studies that identified HSGPA as the most significant predictor of academic performance (e.g., Al-Alwan et al., 2013; Alhurishi et al., 2021; Alnahdi, 2015; Alshammari, 2020). For example, Alhurishi et al. (2021) found that HSGPA outperformed GAT and AT in predicting GPA for students in allied health programs. Alshammari (2020) and Alnahdi (2015) reached comparable conclusions, confirming HSGPA's dominant role across disciplines. However, some researchers have reported that HSGPA is not a strong indicator of university performance or has a weak relationship with university performance (e.g., Abdelfattah et al., 2022; Althewini & Alkushi, 2020; Al Rukban et al., 2010; El-Moussa et al., 2021). For instance, Abdelfattah et al. (2022) found that while HSGPA predicted PYP outcomes, it did not significantly correlate with GPA across the full academic program. Similarly, El-Moussa et al. (2021) reported no predictive power for HSGPA or GAT in a Saudi university adopting USA curriculum.

This study also found that AT was significantly correlated with academic performance in the PYP and the degree, but at a lower level than HSGPA. These findings are consistent with studies in other countries on the predictive power of admission criteria that are similar to AT, such as the Gaokao in China (Farley & Yang, 2020; Yang, 2014). Specifically, Yang (2014) found that Gaokao subject scores, particularly in mathematics and Chinese, were significantly associated with undergraduate GPA, although the strength of these associations varied by subject track. Likewise, in South Korea, studies such as Bae (2007), Han and Bae (2015), and Chung et al. (2024) have demonstrated the

value of the College Scholastic Ability Test (CSAT), especially in STEM-related disciplines, as a key admission indicator linked to student academic performance.

The current findings about the predictive power of AT are consistent with some studies based in Saudi Arabia (e.g., Al Alwan, 2009; Al-Alwan et al., 2013; Alnahdi, 2015; Alshammari, 2020; Qahmash et al., 2023; Vista & Alkhadim, 2022). However, they differ from those of Vista and Alkhadim (2022) and Qahmash et al. (2023) who reported that AT was the best predictor. The findings are also contradictory to those in some studies (e.g., Abdelfattah et al., 2022; Alamoudi et al., 2021; Al-Asali et al., 2018; Hassan & Al-Razgan, 2016) that the AT did not predict academic performance. The differing findings of this study compared with these other Saudi-based studies might be due to the research design, including the type of data collection and study period. For instance, Al-Asali et al. (2018) examined student performance in engineering colleges, focussing on overall GPA at the PYP level. Abdelfattah et al. (2022) also studied engineering students but tracked overall GPA from the PYP through to graduation. Hassan and Al-Razgan (2016) specifically analysed the overall GPA of female students in the College of Computer Science and Alamoudi et al. (2021) concentrated on basic science courses in health science colleges at the PYP level. These differing focusses show how findings related to the predictive validity of admission criteria can be affected by differences in study variables and disciplines.

This study found that GAT had limited predictive power, explaining only a small portion of the variance, and in most cases, it was not significant in predicting university academic performance. This is inconsistent with studies showing that the GAT or its equivalent in other countries, such as the SAT in USA, generally serves as an effective predictor of undergraduate students' academic performance (e.g., Bettinger et al., 2013; Camara & Echternacht, 2000; Häkkinen, 2004; Price & Kim, 1976; Shaw et al., 2011; Westrick et al., 2019; Zwick, 2023). For example, Shaw et al. (2011) indicated that SAT scores had strong predictive validity in STEM fields and enhanced the explanatory power of HSGPA across all disciplines. Yet, researchers such as Zwick (2023) have acknowledged that the standalone predictive power of aptitude tests like the SAT may be lower than that of HSGPA, suggesting that the added value comes primarily through composite use. This has also been reported in the context of Saudi Arabia (e.g., Al Alwan, 2009; Al-Alwan et al., 2013; Alnahdi, 2015; Alhurishi et al., 2021; Alshammari, 2020; Qahmash et al., 2023;

Vista & Alkhadim, 2022). Specifically, Al-Alwan et al. (2013) reported that GAT, alongside HSGPA and AT, significantly predicted cumulative GPA over three years, though HSGPA remained the strongest. Alnahdi (2015) similarly found that GAT contributed to predicting graduation outcomes, though it was not the leading predictor for GPA. More recently, Vista and Alkhadim (2022) confirmed GAT's contribution to models predicting both PYPGPA and graduation likelihood across multiple institutions. However, the current findings align more closely with a substantial body of Saudi research that questions GAT's predictive validity. For instance, Abdelfattah et al. (2022) observed that while GAT correlated with PYPGPA, it did not significantly predict overall GPA across the degree. Alghamdi and Al-Hattami (2014) also reported that GAT failed to predict GPA in a large, mixed-gender sample, whereas HSGPA and AT were statistically significant. Similarly, Alhadlaq et al. (2015) found that while HSGPA and AT were associated with student success in the PYP and SYGPA, GAT did not contribute meaningfully to the prediction. Murshid (2013) and Al-Qahtani and Alanzi (2018) likewise concluded that GAT had limited or no explanatory power, particularly in non-health disciplines.

This research adds to the body of evidence by indicating that the combination of HSGPA and AT is the most reliable and sufficient predictor of academic performance in the CBE in the accounting program at QU, in the Saudi Arabia context. These findings are consistent with the Saudi literature (e.g., Al-Alwan et al., 2013; Alnahdi, 2015; Alshammari, 2020).

Both univariate and multivariate analyses revealed that HSGPA and AT were positively correlated with academic performance. These admission methods, which incorporate more procedural knowledge components (i.e., integration & application of knowledge), were strongly associated with the academic performance of accounting students. In contrast, GAT, representing more declarative knowledge components (i.e., knowledge of meaning), showed a weaker correlation in univariate analysis, and no significant correlation in multivariate analysis. This implies that while declarative knowledge may contribute to academic performance, procedural knowledge has a greater impact. The results of this study are consistent with those of previous research identifying the superiority of procedural knowledge in predicting academic performance across various disciplines, such as mathematics (Alreshidi, 2023; Hailikari et al., 2007; Rach & Ufer,

2020), pharmacy (Hailikari et al., 2008) and chemistry (Hailikari & Nevgi, 2010). However, these findings contrast with research by Binder et al. (2019a) that found declarative knowledge to be a reliable indicator of first-year biology students' academic performance. This inconsistency illustrates that prior knowledge type is discipline relevant in predicting academic performance, as demonstrated by Binder et al. (2019a).

The findings about HSGPA in this study do not support the criticism that Saudi HSGPA is less reliable than CEEs such as GAT or AT stemming from perceived variation in grading standards across schools (Al Alwan, 2009; Althewini & Alkushi, 2020). In Saudi Arabia, HSGPA is calculated based on performance across various courses over a period of three years (see Section 2.4.1.2). It reflects both the depth of learning and the consistency of academic performance. This is different from GAT or AT, which is typically determined by just one or two test administrations. The findings suggest HSGPA is a better measure of procedural knowledge.

In this study AT had a significant moderating effect on academic performance in accounting. It was evident from the comparison of incremental R-squared values (see Table 6.8) that AT played a significant incremental role in predicting academic performance, indicating it was a valuable predictor beyond HSGPA alone. One possible explanation for this is that although AT assesses prior knowledge from high school curricula in such subjects as biology, chemistry, physics and mathematics, the significant result reveals that it provided additional insight into a student's ability beyond HSGPA. Therefore, AT contains additional information relative to HSGPA about students' academic potential that contributes to their success in college.

Table 6.7 highlights an interesting pattern: GAT, which assesses more declarative knowledge, had some R-squared values comparable to those for AT for courses such as MIS 110 and MKTG 120. Compared with the R-squared values for HSGPA and AT, that for GAT demonstrated weaker explanatory power in courses requiring greater integration and application of knowledge, such as MATH 122. The relatively low predictive power of GAT could be caused by the type of prior knowledge it assesses, in line with the argument proposed by Alnahdi (2015). The findings validate the conclusion of the Review of National Policies of Education in Saudi Arabia (2020) that most questions of the GAT can be answered through memorisation (see Section 2.5.2.1), which focusses on rote learning rather than application of higher-order thinking skills.

The findings of this study indicate that students with greater HSGPA and AT results performed better in the accounting program in both the short term (PYP & first year) and long term (overall GPA). The findings suggest that students must attain a level of procedural knowledge to excel in accounting studies. This may be because, although accounting is generally regarded as an applied discipline (Biglan, 1973), it encompasses both hard and soft dimensions of the subject (Biglan, 1973; Neumann et al., 2002; Yang & Farley, 2019). According to Neumann et al. (2002, pp. 408-413), the hard dimension advocates for the acquisition of mastery of techniques through a linear process based on factual understanding, whereas the soft dimension is concerned with the accumulation of knowledge through an ongoing process governed by expertise and theoretically derived notions. Yang and Farley (2019, p. 15) explained that with the hard dimension, there is a strong emphasis on practical skills and the ability to apply theoretical ideas to professional contexts, while in the soft dimension, students are required to apply a more open-ended approach to solve problems using oral and written communication. The fact that accounting relies on a higher level of procedural knowledge than declarative knowledge may explain the conclusions of this research.

The emphasis on procedural knowledge in accounting suggests that it is critical for students to develop the ability to integrate and apply their types of prior knowledge effectively in the domain of accounting studies. The findings of this study support studies showing that the procedural prior knowledge type is crucial to succeed in accounting study (e.g., Duff, 2004; Farley & Ramsay, 1988; Rankin et al., 2003).

To summarise, despite some previous studies criticising HSGPA inflation—for example, in the USA (Finefter-Rosenbluh, 2024; Hurwitz & Lee, 2018), Sweden (Wikström & Wikström, 2005) and Saudi Arabia (Mahmoud & Alaraj, 2018)—the findings of this research provide timely evidence that the Saudi HSGPA remains the best predictor of students' academic performance in the accounting program. These findings have significant policy implications that will be discussed in a later section.

7.3 Predictive Power of PYP for Academic Performance in the Accounting Program

RO3 aimed at evaluating how well the business college PYP predicts performance in first-year core courses, FYGPA and overall GPA in the accounting program. To address this objective, the study asked the following research questions:

> **RQ5**: Do individual courses in the PYP and the Preparatory Year Program Grade Point Average (PYPGPA) in the CBE predict performance in first-year core courses, the FYGPA and overall GPA in the accounting program?
>
> **RQ6**: Do any individual courses in the PYP add to or out-perform the PYPGPA in predicting performance in first-year core courses, FYGPA and overall GPA in the accounting program?

The following hypotheses were tested to address these research questions:

> **H3**: Each PYP business college variable (QUN 001, QUN 002, SKL 001 & PYPGPA) is a predictor of academic performance in first-year core courses, FYGPA and overall GPA in the accounting program.
>
> **H4**: Each PYP business college variable predicts academic performance in first-year core courses, FYGPA and overall GPA in the accounting program above what is predicted by the other three PYP business college variables.

The findings in Tables 6.9, 6.10, 6.11 and 6.12 indicate that each of QUN 001, QUN 002, SKL 001 and PYPGP on its own was statistically significant in predicting first-year core courses, FYGPA and overall GPA at the 1% level. The explanatory power of the variables, measured by the average total variance explained for the first-year courses, and for both (FYGPA & overall GPA), respectively is as follows: QUN 001 explained for 27% and 46%, QUN 002 explained for 35% and 58%, SKL 001 explained 26% and 40%, and PYPGPA explained for 29% and 49%. This underscores the important role of PYP variables in predicting academic performance in the accounting program. Based on its consistent significance across these outcomes, it appears that students who performed well in the PYP were more likely to achieve higher academic performance in the accounting program at QU. This supports H3 that QUN 001, QUN 002, SKL 001 &

PYPGPA predict performance for first-year core courses, FYGPA and overall GPA in the accounting program.

The results in Tables 6.13 and 6.14 help address RQ6. First, the R-squared of each univariate is compared for individual PYP courses and PYPGPA in Table 6.13, revealing a consistent high R-squared value for QUN 002, which demonstrates it was the best predictor of academic performance across multiple dependent variables. PYPGPA, while strong in most courses and noteworthy as a predictor of FYGPA and overall GPA, slightly trailed behind QUN 002. It is noteworthy also that QUN 001 predicted the performance particularly well in MATH 111, maintaining high average R-squared values in spite of not surpassing QUN 002 or PYPGPA in terms of overall performance. SKL 001, conversely, demonstrated the worst predictive capacity, with the lowest R-squared values among these variables.

Second, the research assessed the incremental predictive power of QUN 001, QUN 002, SKL 001 and PYPGPA. The findings in Table 6.14 indicate that only QUN 002 significantly incrementally predicted academic performance in these variables, emphasising its importance as a predictor of academic achievement. The other variables (QUN 001, SKL 001 & PYPGPA) did not generally possess significant incremental predictive power. The incremental predictive power of the four variables (QUN 001, QUN 002, SKL 001 & PYPGPA) explained, on average, around 38% of the total variance in first-year courses and 58% for FYGPA and overall GPA. These results support only the part of H4 that states that QUN 002 in the PYP predicts performance in first-year core courses, FYGPA and overall GPA in the accounting program above what is predicted by the other three PYP variables. The part of H4 that claims that QUN 001, SKL 001 or PYPGPA predict performance above other variables is rejected, as they showed non-significant results (see Table 7.1 for a summary of the hypothesis results).

As explained in Chapters 2 and 5, QUN 001 focusses on mathematics and QUN 002 focusses on statistics skills (see Sections 2.6.1 & 5.8.1.3). The findings of this study are consistent with those of previous studies (e.g., Derr et al., 2018; Evans & Farley, 1998; Farley & Ramsay, 1988; Gist et al., 1996; Joynt & de Villiers, 2019; Kho & Kho, 1998; Marcal & Roberts, 2001; Opstad, 2023; Wong et al., 2019) in that discipline-specific prior knowledge in quantitative knowledge and skills, such as mathematics and statistics, were statistically significant in predicting university accounting performance. For instance,

Evans and Farley (1998) and Gist et al. (1996) showed that school final-year advanced mathematics positively related to university accounting subjects. Also, Marcal and Roberts (2001) found that completion of a statistics prerequisite positively impacted performance in a finance course. However, the current findings are inconsistent with studies reporting no significant relationship (e.g., Alcock et al., 2008; Benligiray & Ahmet, 2017; Ely & Hittle, 1990; Keef, 1988; Nasser, 2012; Opstad, 2018).

In the context of Saudi Arabia, the current results support Khoshaim et al. (2018) who reported an association between performance in mathematics in the PYP and college courses. Likewise, Al-Twaijry (2010) demonstrated that student prior performance in mathematics correlated significantly with accounting performance. However, the results are inconsistent with Al-Rabia et al. (2021) who found that students reported that the PYP did not help them to improve although it did help them to adapt in the new environment of higher education studies.

The positive relationship between quantitative courses in the PYP, such as mathematics and statistics, and academic performance in accounting degrees can be attributed to the fact that accounting practice demands quantitative skills, which enhance cognitive abilities (Babalola & Abiola, 2013; Wong et al., 2019). From a CLT (cognitive load theory) perspective (Sweller, 2023), discipline-specific prior knowledge, such as mathematics and statistics can be viewed as a learner's established schema of biologically secondary knowledge. This schema will lower the CL (cognitive load) imposed on a learner's WM (working memory) when they acquire new accounting knowledge and skills. This reduction in CL is primarily due to the lowered level of element interactivity. When learners already possess schemas, their WM can handle new accounting concepts more efficiently, without having to process each element individually.

SKL 001 focusses on improving students' academic knowledge (see Sections 2.6.1 & 5.8.1.3). The positive association between academic skills and performance in academic accounting at university aligns with previous findings (e.g., Jansen & Suhre, 2010; Joynt & de Villiers, 2019; Sablan & Tierney, 2016; Venegas-Muggli, 2019; Venegas-Muggli et al., 2021). For example, Jansen and Suhre (2010) in the Netherlands found that pre-university study skills preparation, particularly in time management and learning skills, positively influenced first-year students' motivation, study behaviour and academic achievement. Sablan and Tierney (2016) claimed that academic skills training in summer

bridge programs evolved students' college knowledge. This illustrates that taking courses that are designed to develop student academic skills help facilitate the student transition from high school to college. It was demonstrated previously that SKL 001 is capable of enhancing students' academic knowledge and skills, thus enabling a smooth transition (Brooman & Darwent, 2014; Byrne & Flood, 2005), as supported by the results of this research.

It is clear from the high R-squared values in both the univariate and multivariate tests that all PYP variables explained a significant portion of the variance in academic performance individually, although most of the variables were not statistically significant in the multivariate test. In other words, with the exception of QUN 002, which had significant results in all first-year courses but not overall GPA, and QUN 001, which demonstrated significant results only in the MATH 111 course and in SKL 001 for BUS 111 in the first semester, the result of the multivariate test indicates that PYP facilitated students' transition and predicted their performance in the first year. However, this predictive power appeared to decline over time as evidenced by the overall GPA in Table 6.14. These findings support those of previous research (Farley et al., 2020; Greefrath et al., 2017) that concluded that university entrance criteria such as pathway programs or measures similar to PYP are more strongly correlated with first-year degree performance than with performance in the later degree. This also supports Farley et al.'s (2020) argument that this is due to the general nature of first-year subjects. Therefore, this study confirms that the PYP provided by CBE at QU contributes to prediction of academic performance in the accounting program, although it requires some attention and improvement in its course design according to some scholars (Alenaizy, 2015; Alghamdi, 2015; Khoshaim et al., 2018) who have claimed that the PYP contributes to student readiness in Saudi Arabian universities.

7.4 Impact of Gender as a Moderator

RO4 aimed to examine whether gender, as a moderator of the relationships between admission criteria (HSGPA, GAT & AT) and PYP, affects academic performance in the accounting program. To address this objective, this study investigated the following research question:

RQ7: Does gender moderate the relationships between the HSGPA, GAT and AT and each of the PYP and first-year core courses, FYGPA and overall GPA in the accounting program?

To answer the RQ7, this research tested H5 as follows:

H5: Gender moderates the relationship between HSGPA, GAT and AT and each of the PYP and first-year core courses, FYGPA and the overall GPA in the accounting program.

Results in Tables 6.3a, 6.3b, 6.5a and 6.5b suggest that gender moderated the relationships between HSGPA or AT and PYP and the first-year core courses, FYGPA and overall GPA in the degree program. However, Tables 6.4a and 6.4b show that GAT and gender had no significant impact on performance.

For the multivariate test, similar to the univariate results, results in Tables 6.6a and 6.6b reveal that gender moderated the relationships between HSGPA or AT and PYP, first-year courses, FYGPA and overall GPA. Again, gender did not influence the relationships between GAT and PYP, first-year courses, FYGPA and overall GPA.

Thus, the pattern of interaction effects was significant, indicating that gender did modify the relationship between variables, especially for HSGPA and AT.

The impact of PYP variables (QUN 001, QUN 002, SKL 001 & PYPGPA) as sole criteria and in conjunction with gender in predicting academic performance in the accounting degree based on gender was tested. The univariate test results in Tables 6.9, 6.10, 6.11 and 6.12 show that gender generally moderated the relationships between the PYP variables, first-year core courses, FYGPA and overall GPA in the accounting program. However multivariate regression results in Table 6.14 suggest that gender did not modify the relationships among variables.

Thus, the pattern of the overall results indicated that gender moderates the relationships between many of the explanatory variables and predicted variables in the accounting program. Therefore, H5 is accepted.

These research findings add to the literature showing that females continue to outperform males in accounting programs. Using gender as a moderator among explanatory variables

in this study, the patterns show that gender modified the relationships between explanatory variables and predicted variables in the Saudi context, which aligns with studies showing that, after controlling for prior academic performance, females outperform males (e.g., Gammie et al., 2003; Tan & Laswad, 2008; Tyson, 1989). However, these results are inconsistent with those of studies showing that, after controlling for entry scores, males generally outperform females (e.g., Bielinska-Kwapisz et al., 2012; Koh & Koh, 1999). Other studies found no significant differences in university accounting programs (e.g., Buckless et al., 1991; Keef & Roush, 1997; Papageorgiou, & Halabi, 2014; Tho, 1994).

The findings of this research lend support to the argument that female students have been more successful in higher education in recent decades than their male counterparts worldwide (Verbree et al., 2023). These findings may be explained by several factors.

First, research indicates that females often outperform males in higher education because of personal traits (Verbree et al., 2023) and the different learning environment of higher education relative to secondary education (Wrigley-Asante et al., 2023). A number of studies have found that women are more conscientious than men (e.g., Mac Giolla & Kajonius, 2019; Nguyen et al., 2005; Verbree et al., 2023), which may partially explain the association between gender and academic performance where females consistently outperform males. It appears at this higher level that female students are more conscientious than their male counterparts, as argued by Furnham and Moutafi (2012) and DiPrete and Jennings (2012), in the sense that they are more disciplined and committed to their studies. Since higher education operates as an independent environment, personal traits become crucial. Even if both genders have similar entry scores, as this research shows, female students may outperform their peers in higher education due to their conscientiousness. In other words, personal traits are strongly associated with academic success. This argument supports that of Verbree et al. (2023) who found that conscientiousness was a significant mediator of the gender gap in achievement, even after controlling for high school prior achievement.

Second, high unemployment rates and uncertainty in the job market have surfaced as a major factor affecting males' academic performance, particularly through their impact on time management (Wrigley-Asante et al., 2023). Wrigley-Asante et al. (2023) claimed that female students typically allocate their time more effectively toward their studies

whereas male students are inclined to engage in extracurricular activities such as pursuing economic ventures and exploring job-related opportunities. This pattern aligns with the findings of Jha and Kelleher (2006), who emphasised that males' underperformance in school is often because of their involvement in socioeconomic and occupational practices that reduce the time available for study. In addition, Pryer et al. (2009) asserted that females tend to dedicate more hours to studying than males and in a study by Crage and Fairchild (2007), although male students acknowledged that their economic activities negatively affected their academic performance, they justified these activities as necessary to support themselves financially and cover expenses related to their education. Thus, involvement in economic activities might impact males' academic performance.

Third, there are significant differences in learning styles and level of motivation between the two genders (Syukur, 2021). Miglietti (2021) found that female students asked questions when they had difficulty understanding an accounting topic. These approaches encourage students to explore topics deeply, pose critical questions, analyse problems, and develop their own knowledge. This argument supports those of Pryer et al. (2009) and Wrigley-Asante et al. (2023). For instance, Pryer et al. (2009) implied that female students tend to outperform male students in the arts and sciences at the higher education level. They observed that females were more likely to ask questions in class and seek feedback on assignments than their male peers. This increased engagement allowed them to express themselves more effectively, leading to a positive impact on their overall academic performance at the university.

Thus, personal traits and the different learning environment of higher education relative to secondary education, economic factors, and learning style and motivation are all possible explanations for gender differences in academic performance at university. However, this phenomenon requires additional investigations in the future, specifically why in the context of Saudi Arabia females perform better than males even if they possess similar entry scores.

7.5 Impact of English Language Proficiency Measured by IELTS on Relative Postgraduate Accounting Performance

RO5 aimed to evaluate the validity of English language proficiency as measured by IELTS score as an admission criterion predicting relative performance of Saudi Arabian

accounting students in MC- versus LC-oriented accounting courses (see Section 1.6 for the definition of MC and LC). To address this objective, the research investigated the following question:

> **RQ8**: Does English language proficiency as measured by the IELTS score of Saudi students affect relative performance in two types of accounting course, more conceptually oriented courses versus less conceptually oriented courses, taught in English?

To answer this question, the research tested H6 as follows:

> **H6**: Students with a higher level of English language proficiency as measured by IELTS score as the admission criterion perform relatively greater in MC courses than LC courses.

The findings as shown in Sections 6.4.1 and 6.4.2 indicate that the IELTS score alone did not have a significant direct effect on mean marks and ranks in MC and LC courses. Similarly, there was no significant interaction between IELTS and academic performance in MC and LC courses. Hence, H6 is rejected. This finding is inconsistent with accounting studies (King et al., 2021; Yang & Farley, 2019) that found significant differences between English language proficiency and relative academic performance in MC versus LC courses in Australian university accounting programs. These different findings might be due to the measure of English language proficiency used. This research used scores from three close bands of IELTS (5.5, 6.0 & 6.5), where the largest difference is only 1 point. In contrast, Yang and Farley (2019) and King et al. (2021) adopted a language user group approach based on ENL, ESL and EFL to represent English language proficiency. This approach used broader distinctions, such as comparing ENL with EFL which is a represents a significantly larger difference than that used in this research. It is possible that the minimal variation in IELTS scores in this research did not allow for a finding of a significant impact of English language proficiency measured by IELTS.

Moreover, the results for MC versus LC indicate a significant difference in marks, but not in ranks, as shown in Sections 6.4.1 and 6.4.2. This difference occurred because ranks are influenced by the overall distribution of grades. When the grade distributions across courses are similar, ranks tend to remain stable, even if individual marks vary significantly. In other words, ranks indicate students' standing relative to their peers in a

cohort and are less sensitive to mark variation that may arise from different assessment task difficulties across courses.

Further, in regard to IELTS and its impact on the academic performance of EFL students, the findings of this research align with those of previous studies in English-language-speaking countries (e.g., Dooey & Oliver, 2002; Farley et al., 2020; Johnson & Tweedie, 2021; Oliver et al., 2012) and in non-English-language-speaking countries (e.g., Aizawa, 2023; Dev & Qiqieh, 2016) that found no significant impact. Dev and Qiqieh (2016), for instance, concluded that IELTS scores had no direct impact on Abu Dhabi University students' academic performance in the UAE. However, these results are not consistent with findings that IELTS has a significant impact on academic performance (e.g., Al-Malki, 2014; Maleki & Zangani, 2007; Schoepp & Garinger, 2016). One reason for this may be that most studies discussed above measured overall academic performance rather than relative performance. These studies often combined average results of several courses in a program. This presents an issue because it ignores differences in grade distributions among courses, as well as differences in the complexity of course materials; thus, results may be misleading or incomplete (Yang & Farley, 2019).

The current findings on the lack of impact of IELTS on relative academic performance of Saudi students in MC and LC accounting courses may be explained by the following factors. First, most of the postgraduate students in this study had attained a BBA. They had acquired prior knowledge of both MC and LC accounting courses in their undergraduate study and built a schema of accounting knowledge and skills in their long-term memory (Sweller et al., 2011). This prior knowledge would reduce the level of element interactivity in learning postgraduate accounting and the reduced intrinsic CL would offset the extraneous CL posed by EMI (English medium instruction), consistent with the argument of Yang and Farley (2019). The finding of this research is also consistent with Fernandez and Peters (2009), who found that EFL postgraduate students had the advantage of being able to draw upon their prior knowledge acquired in their native language in the discipline to acquire new knowledge in EMI programs.

Second, master students are expected to be academically competent because only high-achieving students choose to go on to study for a master degree. To be accepted for the Master of Accounting at KSU, students are required to have a minimum GPA of 3.75 out of 5 in their undergraduate program. This is consistent with the relatively small sample

size of this cohort even though the data covered five years. This means that even if their English language proficiency (measured by IELTS) is weak, their solid prior knowledge of accounting (established schema) could offset the CL caused by their poor English language proficiency and they would still have adequate germane resources/WM to process new accounting knowledge at the master level. As Yang and Farley (2019) argued, 'students who have already displayed greater academic ability have the advantage of both greater working memory and established schema' (p. 21).

Another possible explanation is that the instructors in the master program are bilingual or multilingual with the majority of instructors speaking Arabic as their native language. The instructors could use Arabic in addition to English in classroom instruction. This would lower the extraneous CL caused by the stress of Saudi students due to EMI. This argument is supported by previous studies (e.g., Cummins, 2005, 2007; van der Walt, 2013) arguing that integrating bilingual or multilingual instruction enhances the learning experience of EFL students. The use of students' native language and translation in EMI classrooms has been demonstrated in applied linguistics research to be beneficial (Cook, 2010; Palfreyman & van der Walt, 2017). Cummins (2005) claimed that bilingual instruction is often more effective than monolingual instruction because of the reduced CL and lower demands on WM (Cummins, 2007; Kern, 1994). It has been suggested that students with cognitive academic language proficiency in their first language are able to transfer these skills to their second language (Cummins, 1992). In higher education, recent developments in multilingual instruction have demonstrated that native languages can be used to enhance the retention of new knowledge in long-term memory (Palfreyman & van der Walt, 2017; van der Walt, 2013).

Thus, the academic brilliance of the postgraduates in this study, their prior accounting knowledge, bilingual instruction and, more importantly, the minimal variation in IELTS scores, might all contribute to why language proficiency had a minimal impact on postgraduate students' relative academic performance in the current research.

Table 7.1: Summary of research findings

Hypothesis		Variable	Outcome
H1	Each entrance criterion (HSGPA, GAT & AT) is a predictor of academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program.	HSGPA	Accepted
		GAT	Accepted
		AT	Accepted
H2	Each entrance criterion predicts academic performance in the PYP, first-year core courses, FYGPA and overall GPA in the accounting program above what is predicted by the other two entrance criteria.	HSGPA	Accepted
		GAT	Rejected
		AT	Accepted
H3	Each PYP business college variable (QUN 001, QUN 002, SKL 001 & PYPGPA) is a predictor of academic performance in first-year core courses, FYGPA and overall GPA in the accounting program.	QUN 001	Accepted
		QUN 002	Accepted
		SKL 001	Accepted
		PYPGPA	Accepted
H4	Each PYP business college variable predicts academic performance in first-year core courses, FYGPA and overall GPA in the accounting program above what is predicted by the other three PYP business college variables.	QUN 001	Rejected
		QUN 002	Accepted
		SKL 001	Rejected
		PYPGPA	Rejected
H5	Gender moderates the relationship between HSGPA, GAT and AT and each of the PYP and first-year core courses, FYGPA and the overall GPA in the accounting program.		Accepted
H6	Students with a higher level of English language proficiency as measured by IELTS score as the admission criterion perform relatively greater in MC courses than LC courses.		Rejected

7.6 Key Contributions and Implications of this Research

7.6.1 Key Contributions

This research makes several empirical, theoretical and practical contributions. Empirically, this study fills the gap in the literature on the relevance of admission criteria such as HSGPA and CEEs (GAT & AT) to academic performance in Saudi Arabia, with particular reference to the accounting discipline. This research responds to calls for Saudi research on more disciplines because each has unique challenges and student characteristics (Alghamdi & Al-Hattami 2014; Abdulfatah et al., 2021; Alnahdi, 2015; Alshammari, 2020). Therefore, a key contribution of this research is its investigation of a range of measures of academic ability of the same cohort of students as alternative selection criteria for university accounting programs.

This research is unique in its longitudinal approach and extensive data collection. It examined the impact of HSGPA, GAT and AT on predicting various academic performance measures including three PYP courses, PYPGPA, nine first-year core courses, FYGPA and overall GPA at the end of the degree, with gender as a moderator. It is also unique in that it examined both the absolute and incremental impact of each factor (see Figure 4.4).

Notably, to the best of the researcher's knowledge only a small number of studies have considered gender when investigating the impact of admission criteria on predicted academic performance in Saudi context (Abdelfattah et al., 2022; Alghamdi & Al-Hattami, 2014; Alshammari, 2020; El-Moussa et al., 2021) and none of these investigated the interaction effect of gender on relationships among the variables. The study responds to calls in several studies in the context of this research (e.g., Alnahdi, 2015; Alnahdi & Schwab, 2023; Almulhim, 2021; Vista & Alkhadim, 2022) for future research to examine gender differences in various evaluation studies. This research enriches the findings of previous studies and adds to the literature by expanding the investigation to include gender as a moderator and by providing evidence in a longitudinal study.

In terms of theory, this research innovatively integrates PKT (prior knowledge theory) and CLT cognitive load theory) to assess the predictive power of various admission criteria in Saudi undergraduate and postgraduate programs. Through the integration of these theories, new insights were gained into how they contribute to the prediction of academic performance. This study contributes to the literature by applying PKT and CLT to explain the relationship between admission criteria and academic performance. This approach not only clarifies the applicability of these theories in educational settings but also emphasises their relevance to the improvement of the admissions process and predicting academic performance.

The research provides timely evidence of the effectiveness of different tertiary admission criteria in Saudi Arabia and allows assessment of which type of prior knowledge (DK or PK) is the most appropriate for university selection. It promotes debate on the appropriateness of tertiary admission criteria in selecting accounting students. Therefore, the present research contributes to theoretical knowledge by exploring the applicability of PKT to analyse in depth how different types of prior knowledge (DK & PK)—in this case admission criteria (HSGPA, GAT & AT)—predict academic performance of

accounting students. The review of the literature revealed an absence of research based on a theoretical framework (see Chapters 3 & 4). Thus, this research sheds new light by adopting PKT and investigating to what extent prior knowledge in the form of HSGPA, GAT and AT predicts accounting students' performance. The body of knowledge specifically in the context of Saudi Arabia suffers from a lack of a theoretical development as most of the research is descriptive, especially regarding the phenomenon under investigation (see Section 3.5). Thus, the present research contributes to the literature by conducting a study based on PKT. This understanding has important implications for admissions policies, educational practices and development of interventions aimed at improving student outcomes.

This research complements previous studies by examining the predictive power of different types of prior knowledge, measured by HSGPA, AT, GAT and PYP, and the academic performance of Saudi students in an undergraduate accounting program. The findings of this study revealed that PK, which involves higher-level cognitive skills, was the best predictor of academic performance and was highly correlated with previous academic achievement. Therefore, students with high HSGPA and AT are more likely to succeed in the accounting program, whereas excelling in GAT (DK) alone does not guarantee success in the accounting program.

The research also extends the use of CLT to understand language-related learning difficulties among EFL accounting students. To the best of the author's knowledge, this study exploring the relationship between English proficiency (measured by IELTS) and relative performance in MC- versus LC-oriented accounting courses for postgraduate accounting students in Saudi Arabia represents an important contribution to the literature. The research provides insight into language-related learning challenges and contributes to the relatively underserved field of accounting education research in Saudi Arabia. Despite the small sample size, the methodology and theoretical framework will encourage future studies with larger datasets at different academic levels. Following Yang and Farley (2019), the use of ranks, in addition to marks, in MC and LC subjects addresses limitations in the literature regarding grade distribution differences. These results quantify the effects of language background on academic performance and highlight language-related challenges facing accounting students in an EMI program.

High school students often lack the skills and knowledge required for success in higher education (Lowe & Cook, 2003). This 'preparation gap' may result from numerous factors, including a lack of challenging coursework in high school, inadequate academic advising and support and a lack of emphasis on problem solving in the classroom. This research demonstrated differences between, for instance, a PYP based on science disciplines such as engineering and technology (see Section 2.6.1) and one provided by a business college in regard to requirements, the curriculum and duration. In the specific context of this study, numerous studies have examined the PYP, focussing on the perceptions and challenges of teachers and students, and only in science disciplines (Alamoudi et al., 2021; Al-Amri & Awaji, 2023; Aldarmahi et al., 2022; AlHarbi, 2012; Khoshaim & Ali, 2015a; Khoshaim et al., 2018; Memon et al., 2023). To the author's best knowledge, few studies have investigated the impact of PYP on academic performance of accounting students (see Section 3.5.4). In other words, it was not known to what extent the PYP contributes to students' performance and facilitates the transition from high school to university. The present research focusses on an accounting program that is part of a business college and contributes to address this gap by providing new evidence reflecting the effectiveness of PYP courses and PYPGPA in predicting accounting students' performance measured by first-year courses, FYGPA and overall GPA, with gender acting as a moderator in the context of Saudi Arabia.

According to Saudi's Vision 2030, key to enhancing educational outcomes is the transition from Arabic to English as the medium of instruction. This transition represents a significant challenge, particularly in higher education business colleges, which are included in Vision 2030 for the transition. Evans (2010) pointed out that there is an increase in demand for professionals to be able to communicate in English in non-English speaking countries. However, studies indicate limited English proficiency among Saudi citizens (Alrashidi & Phan, 2015; Bunaiyan, 2019; Elyas & Picard, 2013; Habbash, 2011; Rugh, 2002a, b). This has created considerable obstacles to their competitiveness in the global labour market. Also, many researchers have emphasised the limited capabilities of accountants in Saudi Arabia, with one important area of deficiency being English skills (Alhawsawi, 2014; Al Mallak, 2018; Srdar, 2017). Therefore, this research aimed to evaluate the impact of IELTS scores on the relative performance of Saudi postgraduate accounting students, addressing calls for more studies in EMI universities (Alqarni et al., 2024; El-Moussa et al., 2021; Yang & Farley, 2019). Further, according to Alqarni et al.

(2024), a recent systematic review revealed that no studies had been undertaken in the field of business and management, particularly languages. This indicates a potential gap in research coverage, as social sciences play a crucial role in understanding various aspects of human behaviour and communication. Researchers have called for future research to address this gap. Therefore, building and extending on the literature, this study focusses on EFL students in Saudi Arabia, using IELTS scores to measure English proficiency in relation to predicting the relative performance of accounting students in Saudi Arabia.

Further, the review of literature in Chapter 3 identified a gap in knowledge of the impact of English language proficiency, as measured by IELTS or its equivalent, on relative academic performance in MC and LC accounting courses. Hence, this research sought to add to the accounting education literature by investigate the impact of IELTS on relative academic performance in the accounting program. In other words, this study extends Yang and Farley's (2019) study by investigating whether English language proficiency impacts relative academic performance in two types of accounting course: MC versus. LC. Unlike Yang and Farley (2019), this study compared the relative performance of EFL and measured academic ability using IELTS scores. It found that English language proficiency measured by IELTS alone did not have a significant direct effect on the relative academic performance of Saudi accounting students.

7.6.2 Implications of the Research

The research findings have numerous implications for stakeholders and policymakers in terms of improving admission requirements and policies to improve the accuracy of predicting the success of students. This section highlights the implications of this research for high school, which is relevant to the Ministry of Education in Saudi Arabia regarding the extent to which high schools prepare students for higher education; the NCAHE in regard to GAT and AT and how these tests contribute to the prediction of academic performance; and admission policymakers at QU for the bachelor accounting program in regard to how the PYP contributes in predicting academic performance. Further, a discussion of the role of gender in modifying the relationship between admission criteria and academic performance of accounting students is provided, along with potential implications for universities regarding admission criteria for evaluating academic

performance of accounting students based on gender. Finally, this research sheds new light for admission policymakers at KSU for the master EMI accounting program.

First, the findings of this research provide convincing evidence regarding the validity of the selection tools. This underscores the need to reassess the national weight currently assigned to the three criteria. Having knowledge of the predictive validity of selection tools facilitates the development of evidence-based selection strategies. By validating the efficacy of HSGPA, GAT and AT in predicting academic performance in Saudi Arabia, this research illustrates the importance of maintaining and possibly enhancing these criteria in the Saudi educational context in particular accounting programs. The results indicate that both HSGPA and AT have significant correlations with academic performance in the accounting program, as demonstrated by both univariate and multivariate analyses across multiple predicted variables. Thus, the outcomes of the research illustrate that HSGPA provides a fairer, more equitable and ultimately more meaningful basis for admissions decisions, despite its reputation for unreliability. It thus remains the best available indicator for predicting accounting students' performance. CEEs—in particular GAT—have lower predictive ability, particularly when analysing multivariate data. In parallel with previous research findings (Al-Qahtani & Alanzi, 2018; Qahmash et al., 2023), this research sheds light on the importance of revising the weighting score criteria in business colleges to place more emphasis on HSGPA, followed by AT and less on GAT. Further, given that GAT is designed to measure students' potential abilities, which are rarely measured in high school tests, the use of GAT as a predictor of academic performance is generally questionable. Thus, the NCAHE should work towards improving the predictive validity of the GAT, so that it can match or exceed the predictive ability of the HSGPA and AT, or at least increase its predictive ability. Another option would be to eliminate the GAT completely. This change could save both financial resources and students' time, as it would eliminate the costs associated with administering the test and the amount of time students spend preparing for it and sitting it.

Second, regarding the effectiveness of the PYP, it is imperative for educational policymakers and program designers at QU to take into account QUN 002's apparent strengths and explore what elements make it a strong predictive factor. Additionally, the effectiveness of the PYP could be further enhanced by integrating these elements into

QUN 001 and SKL 001. Hence, based on the findings of the research, students' performance in the degree program in accounting is closely related to their performance in subjects such as mathematics (QUN 001) and statistics (QUN 002) during the PYP. This implies that students' level of understanding, as demonstrated by their results in these subjects, and particularly in statistics, will significantly contribute to their success in the accounting programs. In light of this, efforts may be made during the PYP to assist students in statistics (QUN 002), which has a significant impact on their performance at the accounting program. However, it is vital to assess the mathematics course within the PYP (QUN 001) to enhance its effectiveness in preparing students for the accounting program. This assessment should ensure that QUN 001 can match or exceed the predictive ability of QUN 002.

Third, this research found that for the same entry level, females outperform males academically in all aspects, hence it is better to apply admission criteria that differ between males and females, as is currently the practice at QU. The findings of this research support this procedure. In addition, as Alshammari (2020) emphasised, it is imperative to study Saudi women more comprehensively in Saudi society to identify their needs for future development and provide necessary educational opportunities based on their abilities and academic achievements. This research, therefore, offers an opportunity to understand better the predictors of future success for women, particularly in accounting programs. A deeper understanding of this issue is key to fostering an environment in Saudi Arabia that will allow women to thrive both academically and professionally.

Fourth, this research advances the literature by producing some of the first findings on the relative strength of the IELTS score in predicting student relative performance in EMI accounting programs offered at KSU. Based on the findings and the recognised limitations of the data, IELTS has weak predictive validity. The results indicate that, if entry requirements are to be implemented (as occurs in most institutions), a set proficiency level may not be adequate to ensure success in university courses, especially at postgraduate level. While some pathways are more conducive to success than others, it is evident that some are more successful than others. It is therefore imperative that entry requirements be carefully considered, reviewed at regular intervals, and, if necessary, modified. It is also critical to (continue to) monitor the academic progress of Saudi Arabian students and collect comprehensive data related to the nature of the evidence of

English language proficiency accepted by the university. Maintaining such data provides valuable information that enables researchers to evaluate the effectiveness of minimum requirements set by administrators and policymakers and, more importantly, to guide a university's decision-making processes.

Thus, despite the complexity of collecting this research's target data, considered high risk by universities in both Australia and Saudi Arabia because of the potential involvement of personal information, the research successfully acquired the necessary data. This accomplishment was achieved over an eight-month period through continuous effort by an individual PhD student with advice from research supervisors. However, the extensive time and effort required for this process limited the ability to expand the research to a larger dataset and include more universities. Nonetheless, the researcher is fortunate to have acquired these unique data and make a significant contribution to the scholarship in accounting education, particularly in the Saudi context.

7.7 Limitations and Directions for Future Research

The findings of this research make several significant contributions and implications, as discussed in Sections 7.6.1 and 7.6.2. Nonetheless, this research has several limitations that can be addressed through future research.

First, the findings are limited to admission data for undergraduate accounting students during 2015–17 at QU. In spite of this, the implications of the findings may be relevant to other institutions using similar selection criteria and assessments. However, the relationships among the variables studied may differ in accounting programs in other universities and other disciplines. Therefore, future research could analyse how current admission criteria predict academic performance of accounting students at other universities to increase the generalisability of these findings.

Second, this research focussed only on existing cognitive selection criteria as predictors of performance. Despite acknowledging that academic performance is influenced by a variety of factors, including non-cognitive factors such as sociodemographic background, personality, motivation, self-efficacy and interpersonal skills, these factors are not included in the conceptual framework at this stage. Given that non-cognitive criteria and factors are beyond the scope of this research, future research might investigate these

factors as predictors of accounting students' academic performance. Further, it is crucial to examine how gender influences these factors in predicting academic performance. Enhancing understanding of factors that most significantly influence academic performance for each gender can provide deeper insights and lead to more effective and tailored educational strategies.

Third, the present research investigated the impact of IELTS scores on relative performance of accounting students. The data used in this research were obtained from a single Saudi Arabian university, specifically the Master of Accounting at KSU. In view of this, readers should be cautious when generalising the findings. Future studies could expand on this research by investigating larger datasets with a wider spread of IELTS scores across multiple universities. Further, it would be appealing to replicate the methodology and theory (CLT) of this research focussing on undergraduate students who lack accounting prior knowledge and experience to solve the limitation of this research that having prior knowledge and experience facilitates study and reduces the CL for postgraduate students.

A final limitation of the current research is its inability to explore the viewpoint of students and instructors, which falls outside the scope of this research methodology. Thus, it would be beneficial to conduct a qualitative follow-up study to understand how students dealt with language-related problems in their study courses as well as instructors' points of view about students' performance, especially in MC-oriented courses. Such a study may employ interview or survey questions to examine students' perceptions of their performance in MC-oriented accounting courses as opposed to application courses, and the ways in which language may impact that performance. Such as study would provide a better understanding of the language problems experienced by Saudi Arabian students in the EMI environment and improve the design of language instruction for these students.

Despite the limitations outlined above, the findings of this research provide valuable insights into the subject matter. These results offer sufficient illumination to enhance our understanding and pave the way for future studies in this area—in particular the accounting education literature.

7.8 Concluding Remarks

The central objective of this research was to investigate the appropriateness of current Saudi Arabian university admission criteria for undergraduate and postgraduate accounting programs. First, the research investigated the predictive power of the main admission criteria (HSGPA, GAT & AT) for academic performance in PYP, first-year core courses, FYGPA and overall GPA, adopting PKT. In the beginning, the aim of requiring CEEs (GAT & AT) was to assist admissions officers in identifying candidates who would be able to succeed in college. As a result, they are widely viewed as a more reliable, methodologically rigorous and accurate indicator than HSGPA, despite differences in grading standards between schools for this purpose. However, the reality differs greatly from the perception that HSGPA in college-preparatory subjects is a reliable predictor of student success. As shown in this research, the evidence applies not only to PYP, first-year college grades and FYGPA, but also to long-term college outcomes (overall GPA). It appears that the predictive weight associated with HSGPA increases after the first year, accounting for a greater proportion of variation in overall GPA in the fourth year than in the first. There is consistent evidence that HSGPA is a superior predictor of short- and long-term college outcomes, at least in the accounting discipline as found in this research. In spite of its reputation as 'unreliable', HSGPA remains the best available indicator of student success in college and, therefore, provides a more fair, more equitable and ultimately more meaningful basis for admissions decision-making.

HSGPA is undoubtedly an important admissions criterion, but advocates of CEEs argue that when used in addition to HSGPA, these tests provide additional information that assists admissions officers in making more informed decisions, as well as avoiding the alleged issue of HSGPA inflation. While HSGPA may be a significant predictor of college performance, it has been argued that test scores contribute significantly to it, so combining test scores with HSGPA provides a more accurate prediction than either factor by itself (Burton & Ramist, 2001; Camara & Echternacht, 2000). Unfortunately, even when HSGPA and CEE results are combined, they provide relatively poor prediction of academic performance. As an example, the R-squared of the overall GPA for HSGPA was 47% whereas that of the criteria combined was 52%. Further, this research expanded the analysis by comparing the incremental R-squared values among variables (see Table

6.8). This demonstrated that excluding HSGPA resulted in the most significant loss in predictive accuracy, indicating its crucial importance in the admission criteria. In contrast, removing GAT had a negligible effect, suggesting its minimal contribution to the prediction model. Further, excluding AT had a moderate impact, underscoring its importance but to a lesser extent than HSGPA. Thus, given the importance of CEE in addition to HSGPA, this research concludes that having only HSGPA and AT as the main criteria instead of all three is well justified.

Second, this research examined the effectiveness of the PYP courses and PYPGPA offered by CBE at QU in predicting academic performance as measured by first-year core courses, FYGPA and overall GPA in the accounting program. The study aimed to determine whether this program facilitates the transition from high school to university, a fundamental purpose of the program. The R-squared in both the univariate and multivariate tests explained approximately 38% and 58% of the total variance in first-year courses, FYGPA and overall GPA, respectively. These high values are evident that all PYP variables explained a significant proportion of the variance in academic performance, even though most variables were not statistically significant in the multivariate test. Thus, while the CBE's PYP contributes to academic performance predictions in the accounting program, additional improvements may be necessary for QUN 001 and SKL 001 to optimise predictive power, specifically to match QUN 002, which emerged as the strongest predictor among the PYP variables. As this research is among the first of its kind in Saudi Arabia, it adds to the literature by examining the ability of the PYP involving three courses and the GPA to predict academic performance in the accounting program, as measured by nine first-year core course final marks, FYGPA and overall GPA.

Third, this research investigated whether gender moderates the relationships between HSGPA, GAT and AT and PYP and all first-year core courses, FYGPA and overall GPA in the accounting program. The results revealed that gender does moderate the relationships between admission criteria, PYP and academic performance, significantly so in the vast majority of cases. The pattern generally showed that for the same entry level, females outperform males in all predicated variables in the PYP, first year and overall GPA. Hence, the results support the finding in may studies that female students have been more successful in higher education in recent decades than their male

counterparts worldwide. This research adds to existing literature by including gender as a moderator.

The last objective of this research was to evaluate the validity of English language proficiency as measured by IELTS score as an admission criterion predicting relative performance of Saudi Arabian accounting students in MC- versus LC-oriented accounting courses in the master degree. The conclusion was drawn that English language proficiency measured by IELTS alone does not have a significant direct effect on the relative academic performance of EFL Saudi accounting students. One main reason for this result is that this research only used scores from three close levels of IELTS (5.5, 6.0 & 6.5), where the largest difference was only 1 point. English as a language of instruction does not play a relevant role in academic performance, at least for the Master of Accounting degree in Saudi Arabia, provided that students possess an adequate level of knowledge in the language for which they intend to receive instruction, thus experiencing less CL. Future research should include a larger sample size from multiple universities with a focus on undergraduate students and a wider spread of IELTS scores to enhance the depth and accuracy of the results. The application of this approach will help to address the limitations of the current research and facilitate the development of more comprehensive results.

In conclusion, accounting education needs more scholarly attention in the Saudi Arabia context. Many phenomena need to be investigated to improve accounting education outcomes and the quality of accounting education in regard to factors that predict academic performance, and to identify common issues students face that might prevent them from succeeding academically (see Section 7.7). This research adds to the accounting education literature and highlights potential directions for future research. Scholars are encouraged to replicate, critique and improve on this methodology to contribute to the prediction of accounting academic performance. Such efforts will not only advance the understanding of academic performance predictions but also improve the quality of accounting education.

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Appendices

Appendix A: General Aptitude Test Example Questions

1- Mouth: Food

A: Carrot: Tree C: Palm tree: Trunk

B: Brain: Head D: Eye: Sight

2- Study: Graduation

A: Walking: Arrival C: Former: Later

B: Travel: Crossing D: Goal: Purpose

3- Solid: Liquid

A: Cloud: Water C: Rope: Tying

B: Ice: Oil D: Window: Air

4- Disease: Infection

A: Coldness: Heat C: Recovery: Medicine

B: Fear: Dread D: Sadness: Crying

5- Airplane: Car

A: Bicycle: Rocket C: Venus: Earth

B: Courage: Bravery D: Train: Carriage

6- I advise you not to take knowledge from ... even if you are confident in your mind, always keep it with you to consult, but receive it from ...

A: Books - Pen C: Computer - Teacher

B: Sources - Your intelligence D: Books – Teacher

7- You cannot prevent the birds of .... from flying over your head, but you can prevent them from nesting in ….. your head.

A: Worry - Stop them C: Falcon - Give them

B: Joy - Hinder them D: Success - Work them

8- A number that leaves a remainder of 1 when divided by 2, a remainder of 2 when divided by 3, and a remainder of 3 when divided by 4. What is that number?

A: 9 C: 10

B: 8 D: 11

9- A number, when divided by 7, gives a quotient of 113 and a remainder of 1. What is the number?

A: 593 C: 792

B: 984 D: 542

10- Find the result of (5×3+7) +2

A: 35 C: 40

B: 44 D: 24

11- A number that is not divisible by 7 but is divisible by 11 without a remainder

A: 209 C: 199

B: 324 D: 225

12- If today is Thursday, how many times will Saturday occur in the next 73 days?

A: 10 C: 11

B: 12 D: 13

13- A fuel tank is one-eighth full. When 63 liters are added, it becomes completely full. What is its capacity?

A: 72 C: 75

B: 78 D: 90

14- Brothers are filling a tank. The first fills one-third of the tank, the second fills half of it, and the third fills 8. What is the capacity of the tank?

A: 44 C: 66

B: 56 D: 48

15- If a biscuit weighs half a gram, how many biscuits weigh 40 grams?

A: 40 C: 60

B: 80 D: 150

16- A farm produces 600 litters of milk. If a quarter of the quantity is packed in 1 litter containers, half of the quantity is packed in 0.5 litter containers, and the remaining quantity is packed in 2 litters containers, how many containers are used?

A: 200 C: 825

B: 800 D: 400

17- Two cars are traveling in opposite directions, the first at a speed of 27 m/min and the second at a speed of 33 m/min. How much time did they take to cover a distance of 480 meters?

A: 80 min C: 8 min

B: 60 min D: 6 min

18- A rectangular prism has dimensions of 30 cm, 9 cm, and 12 cm. What is the maximum number of cubes it can contain, given that the side length of each cube is 3 cm?

A: 120 C: 150

B: 100 D: 110

19- The average grade of students in the first school is 84, and in the second school is 90. If the number of students in the second school is twice that of the first school, what is the average grade of students in both schools combined?

A: 88 C: 86

B: 90 D: 92

20- A study was conducted in a sports club on 50 people. It was found that 30 of them practice walking, 14 practice swimming, and 6 do not practice either sport. Find the number of people who practice both sports?

A: Zero C: 3

B: 4 D: 5

Appendix B: Achievement Test Example Questions

1- A massless particle that carries an amount of energy:

A: Theory C: Scientific Law

B: Hypothesis D: Definition

2- Find all the complex solutions for X5−625x=0X5−625x=0:

A: 5±,05±,0 C: 0,±5,±5i0,±5,±5i

B: 0,±25,±25i0,±25,±25i D: ±25,±25i±25,±25i

3- Convert the following equation to a polar equation: y=9

A: 3 csc C: 9 sec

B: 9 csc D: 3 cos

4- Which generator provides the highest electrical current connection? Given that the band gap value for these materials in e.v is?

A: 1 C: 0.5

B: 5 D: Zero

5- The rate of change of velocity with respect to time is:

A: Instantaneous velocity C: Distance

B: Acceleration D: Average velocity

6- The amount of heat required to convert a substance from a liquid to a gas is:

A: Latent heat of freezing C: Latent heat of condensation

B: Latent heat of vaporization D: Latent heat of fusion

7- The step that comes after the hypothesis is:

A: Experiment or hypothesis verification C: Conclusion

B: Observation D: Measurement

8- Which of the following represents a transistor?

A: pnp C: ppn

B: nnp D: nen

9- The overall reaction order for the rate law

R=k[A]2[B]2R=k[A]2[B]2

A: 2 C: 3

B: 5 D: 4

10- Which of the following suggestions would you choose to combat African sleeping sickness?

A: Mosquito control C: Tsetse fly control

B: Termite eradication D: Washing vegetables thoroughly

11- A part of the immune system that functions to activate a specific type of lymphocytes:

A: White blood cells C: Thymus gland

B: Spleen D: Pituitary gland

12- The exchange of genetic material in prokaryotes occurs through:

A: Capsule C: Plasma membrane

B: Pili D: Chromosomes

13- A biologist studied the genetic engineering of certain plants and their potential resistance to insects and diseases. This researcher is working on:

A: Disease research C: Agricultural improvement

B: Environmental protection D: Species study

14- Chemical analysis of DNA showed that 21% of the nitrogenous bases are adenine. What is the percentage of cytosine in this sample?

A: 51% C: 29%

B: 71%. D: 31%

15- A body has 360 ATP. How many glucose molecules does it need?

A: 1 C: 5

B: 7 D: 10

16- It can be said that an object is accelerating if...

A: Its speed and direction remain constant. C: Only the direction of its motion changes

B: Only its speed changes D: Only its velocity changes

17- If a ball falls from a certain height on the surface of the moon, its final velocity compared to its fall from the same height on the surface of the Earth is:

A: Zero C: Smaller

B: Larger D: Equal

18- When the stricker heads the ball towards the goal and the goalkeeper blocks it with his hand, the force exerted by the goalkeeper on the ball is equal to the force that...

A: The ball exerts on the goalkeeper's hand C: The ball exerts on the stricker’s head

B: The stricker’s head exerts on the ball D: The goalkeeper exerts on the stricker’s head

19- Ahmed climbed the stairs to the second floor in the morning in 20 seconds. When he climbed the same stairs to the second floor in the evening, it took him 22 seconds. Which of the following statements correctly describes what happened?

A: The power is the same, but the work is different

B: The power is different, but the work remains the same

C: The power and work in the morning are equal to the power and work in the evening

D: The power and work in the morning are different from the power and work in the evening

20- What is the frequency in hertz at the second resonance of a closed-end tube with a length of 15 cm, given that the speed of sound is 343 m/s?

A: 2287 C: 1715

B: 1143 D: 572

(Please note that the GAT and AT were originally provided in Arabic. The researcher has translated these tests into English to improve clarity and enable a better understanding of the tests for the readers. Further, the researcher selected random practice questions from the Internet that have been used by students to prepare for their tests).

Appendix C: The Dependent Variables

Preparatory Year Program Courses

1. Quantitative Analysis Principals I (QUN 001)
   This course introduces foundational mathematics for business and economics students, covering real numbers, sets, exponents, roots, polynomials, factoring, equations, inequalities, and graphing of linear and quadratic equations.
2. Quantitative Analysis Principals II (QUN 002)
   This course teaches students to collect, analyse and interpret business data, covering variable and sample types, data collection and organisation, central tendency and dispersion measures, skewness, kurtosis, correlations and simple linear regression.
3. University Skills (SKL 001)
   This course offers knowledge to improve university-level skills, focussing on both academic and personal development among students, and how to apply these skills throughout their university tenure.
4. PYPGPA
   After collecting the students' final marks in QUN 001, QUN 002 and SKL 001, the researcher calculated the PYPGPA for each student (see Section 5.8.1.4 for an explanation of how the PYPGPA was calculated).

Note that in the first test of the study, the PYP courses and PYPGPA are treated as dependent variables, while in the second test they are treated as independent variables. The analysis begins by examining the predictive power of the admission criteria variables—HSGPA, GAT, AT and gender—for PYP outcomes. A second analysis investigates how the PYP contributes to preparing students for success in their degree programs; in particular how well it predicts student performance. Given that successful completion of the PYP is a prerequisite for enrolment in their chosen degree program, the PYP is pivotal in the admission process, thus acting as an independent variable in this context. In Figure 4.4, this dual approach is visually represented in the conceptual framework.

First Semester of the First-year Course

1. Mathematics in Social Science I (MATH 111)

   This course provides basic linear algebra, including solutions to linear systems, matrices, determinants, vectors, linear transformations and graphical solutions for linear inequalities. It applies these concepts to economic and administrative contexts and introduces computer solutions for related problems.
2. Principles of Management and Organisation (BUS 111)

   This course introduces fundamental management principles, differentiating managerial from organisational functions. It covers management theories, effective leadership traits and theories of leadership and motivation.
3. Principles of Microeconomics (ECON 110)

   This course provides an in-depth examination of macroeconomic fundamentals, including Gross Domestic Product (GDP) and income equilibrium, investment and money's role in the economy, alongside classical monetary theories. It addresses key issues like inflation, unemployment and stagnation, and examines fiscal and monetary policies. The course concludes with an introduction to economic growth and development concepts.
4. Introduction to Technology (MIS 110)

   This course introduces computer science fundamentals, detailing hardware, software, computer history, system units, peripherals, storage and software basics. It covers networking, Internet use, selecting personal computers, cybersecurity, flow maps and numerical systems.

Second Semester of the First-year Course

1. Principles of Financial Accounting (ACCT 120)

   This course covers financial accounting basics aligned with IFRS, covering the accounting equation, accounting cycle, accrual and cash bases, financial statement preparation, and the measurement, presentation and disclosure of financial statement elements.
2. Principles of Macroeconomics (ECON 120)

   This course explores macroeconomics, focussing on GDP, sector income equilibrium, investment, money economic role and classical monetary theories. It

addresses inflation, unemployment, stagnation, fiscal and monetary policies, and introduces economic growth and development principles.

3. Business Statistics 1 (STAT 124)

   This course covers probability fundamentals, sampling distribution and statistical inference, focussing on estimating and testing population parameters. It includes practical applications in business administration using R software or MS Excel.

4. Principles of Marketing (MKTG 120)

   This course provides an overview of modern marketing basics, importance for organisations and marketing practice objectives. It addresses critical topics like the marketing process, environment, consumer behaviour, market segmentation, targeting and marketing mix decisions and challenges.

5. Mathematics in Social Science II (MATH 122)

   This course introduces single-variable calculus, focussing on function relationships, graphical representation, limits, derivatives, optimisation and integration, including their applications in economics and management. It also covers multivariable functions and partial derivatives and features computer-assisted applications.

6. FYGPA

   After collecting the students' final marks for all the above core courses, the researcher calculated the FYGPA for each student (see Section 5.8.1.4 for an explanation of how the FYGPA was calculated).

7. Overall GPA

   The overall GPA of the students was collected from the Admissions Office, indicating the overall GPA of each student at the end of their degree, regardless of whether the student had graduated. The data collection occurred in August 2022 and the cohorts started between 2015 and 2017, which suggests that the students had either graduated or were at the end of their studies.

Appendix D: Copies of the Ethics Approval Letters from Qassim University and King Saud University

Ethics Approval from QU

Kingdom of Saudia Arabia
Ministry of Education
Qassim University
Deanship of Scientific Research

جامعة القصيم
Qassim University

المملكة العربية السعودية
وزارة التعليم
جامعة القصيم
عمادة البحث العلمي
(٤٠)

الرقم : ٦٧٧٦٦ التاريخ : ١ / ١١ / ١٤٤٣هـ

المرفقات :

الموضوع :

سعادة عميد كلية الاقتصاد والإدارة حفظه الله

السلام عليكم ورحمة الله وبركاته

نفيد سعادتكم أن باحث الدكتوراه/ يزيد بن محمد البطي من جامعة فيكتوريا في استراليا يقوم بإعداد دراسة بحثية بعنوان:

(Analysing Existing Saudi Arabian University Admission Criteria for Accounting Programs).

وتتطلب الدراسة جمع البيانات التالية:

١. درجات الطلاب في القبول (معدل المرحلة الثانوية – درجات القياس والتحصيلي).

٢. درجات الطلاب في السنة التحضيرية ودرجات التخصص في السنة الأولى في الكلية.

نأمل من سعادتكم تسهيل مهمته بجمع البيانات من قسم المحاسبة في كليتكم، علماً أن أداة الدراسة تمت الموافقة عليها من اللجنة الدائمة لأخلاقيات البحث العلمي بجامعة القصيم.

وتقبلوا خالص تحياتي.

ع العمري

د.الرقيعي

عميد عمادة البحث العلمي

د/منصور بن صالح الشريدة

The University is accredited BY EEC-HES
(Education Evaluation Commission - Higher Education Sector)
May 1, 2013 - April 30,2020

الجامعة معتمدة أكاديمياً من
هيئة تقويم التعليم - قطاع التعليم العالي
١ - مايو ٢٠١٣ - ٣٠ - أبريل ٢٠٢٠

P.O.BOX: 6640 -

Scanned with CamScanner

Kingdom of Saudi Arabia
Ministry of Education
Qassim University
Deanship of Scientific Research
(040)

Qassim University

No. 67766 Date: 31/05/2022
Encl. Sub.

His Honour Dean of the Faculty of Economics and Management

Greetings,

We inform you that the PhD Researcher / **Yazeed Mohammad Alboty** from Victoria University in Australia is preparing a research study entitled:

(Analyzing Existing Saudi Arabian University Admission Criteria for Accounting Programs).

The study requires collecting the following data:

1. Students' grades in admission (High School GPA, General Aptitude and Achievement Scores).
2. Students' grades in the preparatory year and first year core courses at the college.

We hope that you will facilitate his task to collect data from the accounting department in your college, knowing that the study tool has been approved by the Standing Committee for the Ethics of Scientific Research at Qassim University.

With Best Regards,,,

Dean of the Deanship of Scientific Research

Dr. Mansour bin Saleh Al Shraideh (s/d)

The University is accredited BY EEC-HES
(Education Evaluation Commission – Higher Education Sector)
Mar 1, 2013- April 30,2020
PO BOX 6640 - Buraidah:51452 - Tel & Fax:(016) 3800882

Kingdom of Saudia Arabia
Ministry of Education
Qassim University
Deanship of Scientific Research

المملكة العربية السعودية
وزارة التعليم
جامعة القصيم
عمادة البحث العلمي
(٠٤٠)

Qassim University
جامعة القصيم

الرقم : ٦٧٦٠٦ التاريخ : ١ / ١١ / ١٤٣٢هـ

المرفقات : الموضوع :

سعادة عميد عمادة القبول والتسجيل **حفظه الله**

السّلام عليكم ورحمة الله وبركاته

نفيد سعادتكم أن باحث الدكتوراه/ يزيد بن محمد البطي من جامعة فيكتوريا في استراليا يقوم بإعداد دراسة بحثية بعنوان:

(Analysing Existing Saudi Arabian University Admission Criteria for Accounting Programs).

وتتطلب الدراسة جمع البيانات التالية:

١. درجات الطلاب في القبول (معدل المرحلة الثانوية – درجات القياس والتحصيلي).

٢. درجات الطلاب في السنة التحضيرية ودرجات التخصص في السنة الأولى في الكلية.

نأمل من سعادتكم تسهيل مهمة الباحث بجمع البيانات المطلوبة، علماً أن أداة الدراسة تمت الموافقة عليها من اللجنة الدائمة لأخلاقيات البحث العلمي بجامعة القصيم.

وتقبلوا خالص تحياتي.

ع الحربي
د.الرقيعي

عميد عمادة البحث العلمي
د/منصور بن صالح الشريدة

The University is accredited BY EEC-HES
(Education Evaluation Commission - Higher Education Sector)
May 1, 2013 - April 30,2020

الجامعة معتمدة أكاديمياً من
هيئة تقويم التعليم - قطاع التعليم العالي
١ - مايو ٢٠١٣ - ٣٠ - أبريل ٢٠٢٠

P.O.BOX: 6640 - Buraidah:51452 - Tel & Fax:(016) 3800882

ص.ب: ٦٦٤٠ - بريدة ٥١٤٥٢ - هاتف وفاكس ٣٨٠٠٨٨٢(٠١٦)

Kingdom of Saudi Arabia
Ministry of Education
Qassim University
Deanship of Scientific Research
(040)

Qassim University

No. 67606 Date: 31/05/2022
Encl. Sub.

His Honour Dean of the Deanship of Admission and Registration

Greetings,

We inform you that the PhD Researcher / **Yazeed Mohammad Alboty** from Victoria University in Australia is preparing a research study entitled:

(Analyzing Existing Saudi Arabian University Admission Criteria for Accounting Programs).

The study requires collecting the following data:

1. Students' grades in admission (high school GPA, General Aptitude and Achievement Scores).
2. Students' grades in the preparatory year and first year core courses at the college.

We hope that you will facilitate his task to collect data from Admission and Registration department, knowing that the study tool has been approved by the Standing Committee for the Ethics of Scientific Research at Qassim University.

With Best Regards,,,

Dean of the Deanship of Scientific Research

Dr. Mansour bin Saleh Al Shraideh (s/d)

The University is accredited BY EEC-HES
(Education Evaluation Commission – Higher Education Sector)
Mar 1, 2013- April 30,2020
PO BOX 6640 - Buraidah:51452 - Tel & Fax:(016) 3800882

القصيم-بريدة-طريق الملك عبدالعزيز (الخبيب) 0567922819

Ethics Approval from KSU

جامعة الملك سعود
King Saud University
عمادة البحث العلمي

المملكة العربية السعودية
ص.ب 2454 الرياض 11451
www.ksu.edu.sa

جامعة الملك سعود (034)
هاتف +966 11 4673355
فاكس +966 11 4678697

Ref No: KSU-HE-22-309

سعادة الباحث/ يزيد محمد عبدالله البطي **حفظه الله**

السلام عليكم ورحمة الله وبركاته

إشارة إلى توصية اللجنة الفرعية لأخلاقيات البحوث الإنسانية والاجتماعية في جلستها الثلاثين بتاريخ ١٤٤٣/٠٩/١٨هـ، الموافق ٢٠٢٢/٠٤/١٩م.

نفيد سعادتكم بموافقة اللجنة الدائمة لأخلاقيات البحث العلمي على إجراء البحث الموضح بالجدول الآتي:

م	الاسم	عنوان البحث	الأداة	الحالة
١	**يزيد محمد عبدالله البطي**	تحليل معايير القبول الحالية بالجامعات السعودية لبرامج المحاسبة	**بيانات ثانوية**	**الموافقة**

وعليه نأمل من الجهات المعنية بالجامعة تسهيل مهمة الباحث.

وتفضلوا بقبول وافر الاحترام

عميد البحث العلمي

نائب رئيس اللجنة الدائمة لأخلاقيات البحث العلمي

أ.د محمد بن إبراهيم الوابل

صورة إلى سكرتير اللجنة الدائمة لأخلاقيات البحث العلمي

٤/٦٧/٢٥٥٦٠١

١٤٤٣/١٠/١٠

التاريخ : / / ١٤هـ الموافق: / / ٢٠هـ

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Deanship of Research
REF. No.: KSU-HE-22-309

Dear Researcher/ **Yazeed Mohammed A. Alboty,**
May the Peace & Mercy of Allah be upon you

With Reference to the recommendation of Humanities & Social Sciences Research Ethics Sub-Committee in its thirtieth session on 18/09/1443 AH corresponding to 04/19/2022 AD, we would like to inform you that the Standing Committee on the Ethics of Scientific Research has agreed to conduct the research shown in the following table:

S#	Name	Search Title	Instrument	Status
1	**Yazeed Mohammed A. Alboty**	Analysing Existing Saudi Arabian University Admission Criteria for Accounting Programs	Secondary Data	Approved

Accordingly, we hope that the concerned authorities at the university will facilitate the researcher's task.

Regards,

Dean of Scientific Research
Vice Chairman of the Standing Committee for the Ethics of Scientific Research
//signature//
Prof. Dr. Mohammed bin Ibrahim Al-Wabel
CC: The Secretary of the Standing Committee for the Ethics of Scientific Research
106552/76/4
10/10/1443
//Seal of King Saud University - Standing Committee on the Ethics of Scientific Research//