

AN EXAMINATION OF LEARNING OUTCOMES BETWEEN LOCAL AND INTERNATIONAL CHINESE STUDENTS: EVIDENCE FROM AN AUSTRALIAN ACCOUNTING PROGRAM

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ABSTRACT

We investigate the impact of student origin on the academic performance of final year undergraduate accounting students at one of the largest universities in Australia. In particular, the effect of student origin is examined by comparing the performance of local Australian and international Chinese students. We develop a number of propositions to test whether there is any difference in the academic performance (where academic performance is measured by performance in the final exam) of local Australian and international Chinese students. An association was observed between student origin and accounting performance and results indicate that Australian students significantly outperform Chinese students. Moreover, the results indicate that a disparity exists between the academic performance of Australian students and international Chinese students, particularly when assessments are designed to test analytical and interpretation skills. The findings suggest that

international students need to be provided with appropriate academic support so that they are able to acculturate to their new learning environment and improve their academic performance.

Keywords: tertiary students, performance, national background, education

Data availability: Data and the research instrument can be obtained from the first author

INTRODUCTION

This study is motivated by inconsistent and inconclusive prior evidence on the determinants of the academic performance of local and international accounting students (see Ramburuth and Tani, 2009; Rankin et al., 2003). We investigate the impact of student origin on the academic performance of final year undergraduate accounting students at one of the largest universities in Australia. The effect of student origin is examined by comparing the performance of local Australian and international Chinese students. A number of propositions are developed to test whether there is any difference in the academic performance (where academic performance is measured by performance in the final exam) of local Australian and international Chinese students.

A number of studies have examined how international students from diverse backgrounds acculturate to their new learning environments and how they perform (see Ramburuth and Tani, 2009 for a review of these studies). As far as the academic performances of international Chinese students are concerned, the findings are somewhat mixed. For example, some researchers, including Phillips (1990), have pointed out that Asian education systems may be utilizing “surface” and non-critical approaches to learning while in Australian or Western education systems, more reflective and analytic approaches to learning and teaching are used. Biggs (1996) refuted such claims, however, labeling them as “stereotyping” and providing evidence of the high-academic achievements of Asian students in their home-countries and abroad. Others have argued that Chinese students are not surface learners, but are positioned on a continuum between deep and surface learning poles (Kember, 1996, 2000; Leung et al., 2008).

In the present paper, we provide a more thorough investigation of the performance of local and international accounting students. To provide a greater insight into the academic achievements of Australian and Chinese students, we assess their performance across four groups of exam questions (recall-based and application-based theory questions and recall-based and application-based practical questions). Answering recall-based questions requires students to mostly “recall” from their memory, whereas answering application-based questions entails a high level of conceptual and evaluation skill where principles and theories must be remembered and applied (Hwang et al., 2005, 2008). The results of this study are intended to determine whether Asian students are utilizing surface and non-critical approaches to learning, or more reflective and analytical approaches to learning to achieve better academic performance. A surface approach requires placing emphasis only on accounting procedure and technical skill, whereas a deep approach entails a high level of conceptual and evaluation skill (Wong and Chia, 1996). It is expected that the level of academic performance between the Australian and Chinese students may differ because of differences in cultural and educational backgrounds, learning approaches, and student language skills.

Prior studies suggest that the performance of local and international students may differ significantly as a result of many factors (Niles, 1995; Ramburuth, 2000). Differences in academic

performance between local and international students may be caused by the inability of international students to quickly adapt to a foreign environment (Gao, 2008). A number of prior studies have also found significant relationships between the type of approaches to learning adopted by students and their academic performance (Booth et al., 1999; Davidson, 2002; Eley, 1992). Most of these studies, including Eley (1992) and Booth et al. (1999), have found significant correlation between surface approaches to learning and lower academic grades, and between deep approaches to learning and higher academic grades. We argue that the pre-tertiary educational background of students, which incorporates the effects of national culture, learning approaches and language skills of the students, may have an impact on their academic performance.

Whilst the need to develop appropriate accounting skills has contributed to the internationalization of university education, accounting educators must ensure that students from different national backgrounds are able to develop their critical thinking, analytical and judgment skills. This is because international accounting standards contain broad principles, the function of which is to guide judgments made in practice. As the emphasis on judgment increases, one potential implication for accounting education is the need to develop the required judgment skills within the accounting education programme (Schipper, 2003. p. 61).

Although a number of prior studies have provided tentative evidence that Chinese students perform well in factual recollection questions and marginally in reasoning and analytical types of questions (cited in Chan, 1999), it is uncertain whether this difference still exists in their final year of tertiary education. It is expected that international Chinese students in their final year of study should have attained a level of familiarity with the Australian learning style: hence, their analytical and interpretation skills should be better developed. Prior studies have provided limited evidence on the performance of Chinese students in both recall-based and application-based theory and practical questions.

This paper provides valuable insights into the academic performances of international students, which is an important area of research as Western universities have a significant percentage of foreign students (IDP Education Australia, 2011; Ramburuth and Tani, 2009).¹ It is imperative for Australian educators to consider the teaching effectiveness and teaching efficiency issues in their respective accounting programs, so the learning outcomes of Chinese students, and those of students from other countries, can be improved.

An association was observed between student origin and accounting performance, and results indicate that Australian students significantly outperform Chinese students. Moreover, differences in final exam performance are greater in theory-based questions than in practical-based questions, and likewise in application-based questions than in recall-based questions. The results indicate that there is disparity between the academic performance of Australian and international Chinese students, particularly when assessments are designed to test analytical and interpretation skills. The findings suggest that international students need to be provided with appropriate academic support so that they are able to acculturate to their new learning environment and improve their academic performance.

The remainder of the paper is organized as follows. The second section discusses the relevant theoretical basis for the study and formulates the research hypotheses. Section three outlines the

¹For example, international students from non-English speaking backgrounds, such as China, are traveling to western Anglo-Saxon countries to access higher education (see IDP Education Australia, 2011).

research methods, followed by the results and discussion in section four. The final section covers the conclusion and implications of the study.

THEORY AND HYPOTHESES DEVELOPMENT

Background

It is well understood that both education and academic accomplishments are viewed as an essential “path to employment” and advancement (Gao, 2008; Hess et al., 1987. p. 180). Individuals with stronger academic performance have better job opportunities and higher bargaining power with respect to employment. This is because, amongst other things, employers often rely on an individual’s academic achievements when selecting and rewarding employees. Consequently, tertiary students have an incentive to perform to the best of their abilities whilst undertaking their university education. However, it is reasonable to expect differences in the levels of academic achievement among university students. Apart from factors such as effort, natural ability, subject interest and cultural background, the adoption of different learning approaches has been found to have a significant impact on the academic performance of students.

The two most recognized learning approaches are deep learning and surface learning. Students who adopt a deep learning approach seek out the inherent meaning of a subject because of genuine interest, as well as their intrinsic motivation for academic tasks. Such students better engage in the learning process by relating these tasks to their “own experience” (Gow et al., 1994; Kember, 1996. p. 342). They seldom memorize learning materials because the purpose of memorization is viewed as an “unintentional by-product” that mainly assists with learning and understanding concepts (Kember, 1996. p. 343).

Surface learners, on the other hand, tend to memorize without the intention of understanding, which is known as “rote memorization” (Marton et al., 2005). That is, they attempt to memorize concepts by material replication. Their strategy is to focus on learning materials from the syllabus because the “fear of failure in tests” and examinations is the major motivation to study (Gow et al., 1994. p. 118). Students consider obtaining “paper qualifications” as a demand to be met and thus have minimal personal attachment to academic tasks (Gow et al., 1994; Kember, 1996). The two learning approaches are widely divergent and are at opposite ends of a continuum. Overall, Ramburuth and Mladenovic (2004. p. 512) summarize the generalizations that have emerged from students’ approaches to learning as follows: (a) “the outcomes of a deep approach to learning are more consistent with the goals of higher education”; (b) “the outcomes of a surface approach to learning are highly incompatible with the goals of higher education”; and (c) “deep approaches are related to higher quality outcomes and better grades”.

The selection of one learning approach over another may be influenced by country-specific factors such as prevalent cultural values and the system of education. These factors also affect learning behaviors and the performance of university students within and across countries. For example, Kingston and Forland (2008) found tensions resulting from the expectations of students from an East Asian collectivist culture and academic staff from a western individualistic culture. Hofstede’s (1983) individualism and collectivism dimension (which is one of the four dimensions of societal cultural values explaining the relationship between individuals and social groups), provides some insight into the different educational systems and learning behaviors of individuals across countries.

In individualistic societies, learning tends to be self-initiated and personal. Students are motivated to learn “new topics” and are not afraid to express their opinions (Abeysekera, 2008. p.

190). Teachers are viewed as “guides” and students are not discouraged from presenting contradictory ideas. Most importantly, responsibility for learning rests with the students themselves, who are highly competitive (Auyeung and Sands, 1996). In contrast, a collectivist society is more group-oriented and individuals usually attach themselves to “the group”; hence there is an emphasis on interdependence, harmony, family security, cooperation, and a preference for less competition (Auyeung and Sands, 1996. p. 265). Students are encouraged to learn through observing and listening. Teachers are viewed as experts and are responsible for passing on their knowledge, and accordingly are highly respected by students (Auyeung and Sands, 1996; Jin and Cortazzi, 2006).

According to Hofstede (1983), Asian countries such as China are categorized as collectivistic whilst Western countries like Australia are highly individualistic, and the adoption of different learning approaches between the two countries is expected. The impact on learning behavior and overall student performance can also be influenced by cultural differences between these two countries, in particular, pre-tertiary education background (Rastall, 2006; Spencer-Oatey and Zhaoning, 2006). We, therefore, briefly examine the differences in pre-tertiary education learning styles between Western and Chinese culture.

In East and Southeast Asia, particularly in the “Confucian-heritage” cultures such as China, Taiwan and Hong Kong, it is observed that classes are generally large with over 40 students per class. Teaching mainly focuses on preparation for external examinations that address low-level cognitive goals and are highly competitive; thus, pressure is exerted on both teachers and students (Biggs, 1996; Chan, 1999; Wong, 2004). Students in Western countries believe in exploration before skill development, which is contrary to the Chinese, who believe in skill development before creativity (Biggs, 1996). Asian teachers do not merely expect students to listen and memorize, rather, they encourage first developing the skill of repetition, a tool that will later be used for creating meaning and interpretation, which suggests that Chinese students also aim for high level learning (Biggs, 1996).

Repetitive learning is viewed as assisting students in the accurate recall of information and enabling them to attach meaning to the material learned, thereby enhancing understanding (Chan, 1999; Marton et al., 2005). This strong focus on repetition is due to the traditional Chinese belief that a highly educated, civilized person can memorize the classics as a way of showing respect and as acknowledgement of past scholarly works. Memorization rather than rote learning is thus strongly encouraged, and teaching materials are structured to foster the memorization process such that students should demonstrate good memorization whenever required (Chan, 1999; Hui, 2005). This teaching style is largely underpinned by the belief that books are sacred, and is also considered by most Chinese students to embody Confucian moral virtues. In addition, re-reading is a recommended learning strategy, which is the prerequisite of gaining new knowledge (Hui, 2005). Because Chinese students focus on learning through concrete examples, they are able to perform exceedingly well in “mechanical” subjects, such as law and accounting, yet it is a challenge for them to grasp the “softer” areas in which judgement and abstract thinking are required, mainly because problem-solving skills are often neglected when assessing students’ achievements through written examination (cited in Chan, 1999. p. 299). The pre-tertiary learning method enhances our understanding of Chinese students’ learning behavior before entering university. It is of interest to compare the performance of Chinese students undertaking higher education in Australia with that of local Australian students.

Performance of Local (Australian) and International (Chinese) Students

Prior studies have provided evidence that Australian students adopt a deep learning approach (Ramburuth, 2000; Richardson, 1994). Ramburuth (2000) found that Australian students are independent learners who prefer to evaluate learning by constantly adopting a critical thought approach, because they are encouraged and trained to think analytically. Australian students also learn central concepts and are generally more active in seeking assistance when needed (Phillips, 1990; Ramburuth, 2000). Furthermore, they are motivated by inter-personal competition and constantly strive to attain the highest goals (Niles, 1995).

Early researchers criticized the anecdotal stereotype that Chinese students are “rote learners” and adopt a surface learning approach (McKay and Kember, 1997; Richardson, 1994, p. 453). However, it has since been discovered that earlier researchers had incorrectly adopted such stereotypes merely because Chinese students were observed to memorize study materials frequently (Kember, 2000). It is now evident that they memorize to gain a deeper understanding known as “memorization with understanding” or “deep memorizing” (Biggs, 1994; Kember, 1996; Marton et al., 1997; Ramburuth, 2000). As already noted, Chinese students are not surface learners, but are positioned on a continuum between deep and surface learning poles (Kember, 1996, 2000; Leung et al., 2008).

Although being high achievers and successful in their tertiary studies (Marton et al., 2005), Chinese students are accustomed to learning through “pouring and filling”, and by accepting information as given, thereby learning in detail, but they have limited exposure to, nor do they attempt to engage in, critical thinking (Jin and Cortazzi, 2006, p. 11). Their academic advancement may thus be restricted by the adoption of the latter approach, as well as by their reluctance to seek assistance when difficulties arise (Kember and Gow, 1991; Ramburuth, 2000). Nevertheless, Wong (2004) indicates that within two to three months of university study, it is possible for international Chinese students to adapt their learning style, or to add a new style, when exposed to new learning methods in Australia. The longer these students stay in Australia, the more likely they are to adapt to the new learning style. He further argues that learning styles are contextual rather than being culturally-based.

Cultural factors nevertheless influence the learning outcomes of Chinese students to a certain extent, and the two principal, specifically cultural factors are parental expectations (Gieve and Clark, 2005; Hess et al., 1987) and Confucian teaching (Gow et al., 1994; Smith, 2001). Chinese parental influence on children’s incentives to learn and achieve is established at a very early age when a belief in the value of effort is imposed (Burns, 1991), and in the decision about which university degree their child will attain (Gieve and Clark, 2005). Chinese students are encouraged to work hard, and parents provide the necessary support and guidance to enhance their child’s prospects of success. Chinese parents also believe that persistence will help their children overcome obstacles. In contrast, Australian parents, operating within a culture of individualism (Hofstede, 1983), expect their children to become independent at an early stage in life. Children are, therefore, free to develop their individual potential without the need to uphold family expectations and are more willing to engage in critical debate.

Huang (1969) adopts the four educational principles from Confucian teaching, and illustrates that Chinese culture continues to follow: (a) the role of mental concentration, (b) the primacy of effort, (c) the need for persistence, and (d) the efficacy of effort, supporting the view that the “enemies of study are laziness, giving up quickly and overconfidence” (cited in Hess et al., 1987, p. 180). Chinese students should uphold the value of having the “heart and mind for wanting to

learn” (Li, 2002. p. 248). Therefore, hard work and “putting what is learned into practice” is an established social norm (Jin and Cortazzi, 2006. p. 12). Students in a collectivist culture are expected to listen rather than speak up, thereby giving the impression of rote learning, and as a result, their critical and analytical skills are, in general, less developed compared to those of more individualistic Australian students.

Another important factor hindering student performance regardless of nationality is stress, particularly as related to a transition to university that involves leaving home and undertaking new responsibilities and the burden of time-management due to an increased workload (Robotham, 2008). Without the support of friends and family, international students often confront the “culture shock” of adapting to a society that is frequently inconsistent with their expectations (Hudd et al., 2000; Rastall, 2006; Robotham, 2008; Spencer-Oatey and Zhaoning, 2006). For example, it is argued that there is a lack of “warmth, mutual respect and responsibility, and low levels of interaction expected in Western ‘participative’ styles of teaching” compared to Chinese styles of teaching (Clark and Gieve, 2006. p. 62).

Overseas students whose first language is different from that of the host country also experience the added pressure of becoming linguistically competent (Oropeza et al., 1991; Robotham, 2008) and Bennett (2003) demonstrates that stress negatively impacts academic performance. Overall, prior studies provide evidence that cultural differences exist between Australia and China that may well impact the respective overall performance of Australian and Chinese tertiary students.

Despite the positive attributes of Chinese students and their learning styles (i.e. the need to be hard-working by promoting the value of effort, and the intention to understand and memorize respectively), the differences outlined above may adversely affect the academic performance of Chinese students whilst studying abroad. It is expected that Australian domestic students with extensive practice in critical and analytical thinking will perform better than Chinese students in an undergraduate advanced financial accounting subject that requires both analytical and numerical skills. Therefore:

H₁: Local (Australian) students are likely to achieve higher final exam scores than international (Chinese) students in an undergraduate advanced Financial Accounting Theory and Practice unit.

Performance of Local and International Students in Theory-based and Practical-based Questions

The technique required to answer theory-based questions is different from that necessary for practical-based questions. A surface approach requires a “quantitative change in knowledge” and students only need to emphasize accounting procedure and technical skill, whereas a deep approach entails a high level of conceptual and evaluation skill (Wong and Chia, 1996). Chinese students do not usually possess high levels of conceptual and evaluation skills because they learn from technical material, unlike Australian students who learn from theoretical material (Patel and Schoch, 2003). Hence, Chinese students are, in general, less capable of performing highly in exams that involve written English.

The lack of strong ability in English writing skills is due primarily to (1) a “lack of emphasis on developing English writing in China” (Jin and Cortazzi, 2006. p. 18), (2) the restriction of English writing primarily to formal educational programs, and (3) the absence of everyday use of

English (Kember, 1996; Smith, 2001). Students are encouraged to focus on the rules of grammar and improvement in vocabulary, but there is limited exposure to free writing (Mayor, 2006; Wen and Richard, 2003). Consequently, international students studying in English-medium tertiary institutions struggle to express and convey their ideas adequately in English (Skyrme, 2007), which increases stress and affects performance (Entwistle and Entwistle, 2003; Gao, 2008). It is suggested that there is an interactive effect between language and question format which affects student performance (Jenkins and Holley, 1990), and to perform well in essay-based examinations, there is a need for deep reflection on the topic material and an active search for understanding (Entwistle and Entwistle, 2003). Students whose first language is English, therefore, generally perform better on theoretical open-ended questions than students who have English as a second language (ESL).

English ability is of concern to Chinese students because poor English skills often affect overall academic performance, regardless of mathematical ability (Gow et al., 1994; Wong and Chia, 1996). A number of difficulties are experienced by most Chinese students in using English. First, too much focus is placed on the English word itself and its translated meaning, rather than on gaining a broader understanding of its concept (Kember and Gow, 1994). This learning method, which is known as “bottom-up processing”, makes it difficult for students to obtain the true meaning of words (Kember, 1996. p. 349).

Second, Chinese students have a willingness to accept interpretations given by their teachers, who they regard as having a high level of authority (Kember, 1996; Ramburuth, 2000). They do not engage analytical and critical thinking skills and are inclined not to seek clarification from teachers (Ramburuth, 2000), which is essential in a theory-based subject. Third, because Chinese students lack experience in practising English, they view English words in a similar way to Chinese characters and employ a similar approach to learning. Each Chinese word represents a unique character and has a different meaning when used in conjunction with other words (Jin and Cortazzi, 2006; Kember, 1996. p. 349). Consequently, it is difficult for students to attain a deep understanding of English if they apply the same “bottom-up processing” learning technique.

Fourth, English is mainly undertaken as an academic subject with the objective of achieving a successful result in the International English Language Testing System (IELTS) or Test of English as a Foreign Language (TOEFL), in part to satisfy tertiary entry requirements. Hence, students are often compelled to focus on “examination-oriented learning”, that is, “to learn for the sake of exams” (Gao, 2008. pp. 606, 607; Jin and Cortazzi, 2006). In fact, many students believe that learning new words will improve their English. Often, learning new vocabulary is considered to be an initial step towards improved academic performance in a particular unit (Jin and Cortazzi, 2006). As students struggle with English, they resort to using memorization to pass exams (Salili and Lai, 2003).

It should nevertheless be recognized that some international (Chinese) students have the ability to perform well in both their first and second languages (Mayor, 2006). Their performance is uncertain when they study overseas because performance depends mainly on the ability to think carefully about the specific questions asked in an English-based examination and how best to apply acquired knowledge to adequately address those questions (Entwistle and Entwistle, 2003). Many students write in general terms because they lack the ability to reorganize their understanding and may not have the requisite underlying English knowledge (Mayor, 2006). Furthermore, they often rely on general logic and an immediate reaction to the title of the question when writing an answer, rather than carefully attending to its specific requirements.

Although it is unlikely that Chinese students will outperform Australian students in English language tests, Chinese students are known to outperform Western students in mathematical and science-based subjects (Fuligni, 1997; Hess et al., 1987; Stevenson et al., 2000). It is expected that students who are more proficient in maths may perform well in financial accounting courses, particularly courses that are practical-based (Wong and Chia, 1996). However, if maths problems have to be answered in written English, it is reasonable to believe that some Chinese students will not outperform Western students. It is expected that the difference between Australian and Chinese students in their final exam performance will be greater in the theory-based questions than in the practical-based questions. Therefore:

- H₂:** The difference in the final exam performance between local (Australian) and international (Chinese) students will be greater in analytical or theory-based questions than in practical-based questions.

Performance of Local and International Students in Recall-based and Application-based Questions

Practical and theory questions can be divided into application-based and recall-based questions. Recall-based questions are usually definition-type questions and are more straightforward and simple than application-based questions. Answering recall-based questions requires students to mostly “recall” from their memory. On the other hand, application-based questions require the use of abstract and concrete situations, which may take the form of general or technical ideas, principles and theories that must be remembered and applied (Hwang et al., 2005, 2008). Therefore, application-based questions require deeper understanding and are more complex than recall-based or “memory test” questions.

According to Reid (1989), Chinese students perform well in factual recollection questions and marginally in reasoning and analytical questions. A plausible explanation is that a more conceptual form of learning is vital to understand reasoning and analytics (Beattie et al., 1997; Sharma, 1997), which then enhances the development of higher-order cognitive skills. Materials can be learnt, but skills to solve complex problems or think analytically or conceptually must be developed (Davidson, 2002). Chinese students may lack the appropriate skills to think and reason compared to Australian students because English is a second language for them and learning styles are different, as previously discussed. Therefore:

- H₃:** The difference in the final exam performance between local (Australian) and international (Chinese) students will be greater in application-based questions than in recall-based theory and practical questions.

RESEARCH METHODS

Subjects

The research was conducted as part of the final exam of an undergraduate accounting course (Financial Accounting Theory and Practice) at a large Australian university. This unit was chosen for this study because it is a 300 level core unit for the Bachelor of Commerce - Accounting. The unit is a mandatory requirement for students entering the professional programs offered by both professional accounting bodies, CPA Australia and the Institute of Chartered Accountants in Australia (ICAA), upon completion of their undergraduate degree. This unit is a combination of

financial accounting theory and practice at an advanced level, and the three-hour final exam paper contains compulsory theory and practical questions.

Participants had already completed other introductory financial accounting courses at the 100 and 200 level of their undergraduate accounting program. Therefore, in all cases participants had prior experience in undertaking tertiary examinations and were exposed to various types of examination questions. Whilst a total of 785 students attempted the final exam, only 203 students were local (denoted as students who held Australian citizenship and had completed their pre-tertiary education in Australia) and 460 students were international students from China (denoted as students who had completed their pre-tertiary education in China and had come to Australia to complete their tertiary education). The remaining 122 international students were from other countries including India, Malaysia and Fiji (the sample of students from these individual countries was not large enough to undertake any valid statistical analysis and was therefore discarded).

Tasks and Procedure

The classification of recall-based questions in this study includes components of direct calculations and straightforward theory questions, such as “outline or distinguish the main difference”, whereas the assessment components are generally less difficult. Application-based questions require a thorough understanding of a particular topic; for instance, students are required to critically evaluate a concept or apply certain criteria for practical calculations. It is particularly important that they should apply the knowledge learnt and then use judgement and interpretation in attempting these questions, which renders the assessment components relatively more difficult.

The exam paper consisted of seven questions. All questions were compulsory, except for Question 7, where students were given a choice of one of two alternative questions. The exam comprised a total of 100 marks, with Questions 1 to 6 being worth 15 marks each and Question 7 attracting 10 marks. The exam paper consisted of four theory-based questions (Questions 1, 2, 3 and 7) and three practical-based questions (Questions 4, 5 and 6). Question 1 focused on accounting standard setting approaches (principles-based vs. rules-based), Question 2 focused on issues relating to accounting convergence, and Question 3 integrated positive and normative accounting theory. Question 7, the last theory question, was based on academic articles relating to the measurement of heritage assets and behavioral accounting research. With respect to the practical questions, Question 4 focused on accounting for intangible assets, Question 5 on accounting for leases and Question 6 on employee benefits.

To test the relevant hypotheses, it was necessary to design theory and practical questions that had components of both recall-based and application-based questions. The first three theory questions (Questions 1, 2 and 3) had both recall-based and application-based components. For example, Question 1 focused on the differences between a principles-based as opposed to a rules-based approach to standard setting, and why the former is preferred to the latter. Specifically, Part A of Question 1 was a recall-based theory question: “What are the main differences between the principles-based approach as opposed to a rules-based approach to standard setting?” Part B was an application-based theory question: “Which type of standard (a principles-based or a rules-based) will be better in overcoming creative accounting practices? Why?”

In a similar manner, the three practical questions (Questions 4, 5 and 6) also had components of direct calculations (using recall-based formulas) and application-based questions. For example, Question 4 tested students’ ability to apply the criteria of the Australian Accounting Standards Board (AASB) 138 Intangible Assets to determine the research and development project costs that have

to be expensed or capitalized. Part A of Question 4 was a recall-based practical question: “Outline the criteria given in AASB 138 to determine the costs that can be capitalized relating to research and development”. Part B was an application-based practical question: “Identify (with reasons) the costs that Pret Ltd has to expense (if any) relating to the project”. Extracts from the research instrument are included in the Appendix.

The recall-based and application-based questions were randomized (i.e. not included in any particular order) to mitigate any order effects. In addition, as the research was conducted as part of the final exam, students would have attempted all the questions to the best of their ability, enhancing the external validity of the data.

RESULTS AND DISCUSSION

There were 663 participants to the study and the mean age of both the Australian and Chinese students was 23.6 years. In the Australian sample, approximately 59% of respondents were male and 41% female, whilst in the Chinese sample 42% of respondents were male and 58% female. Demographic data are reported in Table 1.

TABLE 1

Demographic Data

	<u>Australian Students</u>	<u>Chinese Students</u>
Sample Size	203	460
Gender		
Male	119	193
Female	84	267
Age (Mean)	23.64	23.62

Performance of Local and International Students in an Undergraduate Advanced Accounting Theory and Practice Unit (H_1)

A multivariate test (MANOVA) was used to determine whether a significant difference in performance exists between Australian and Chinese accounting students across all seven questions. MANOVA results indicate that a significant difference exists between Australian and Chinese accounting students across all seven questions ($p = 0.000$). The mean of the total exam score for the Australian students is 62% whereas for the Chinese students it is 59%. The results support H_1 that there is a significant difference in performance between Australian and Chinese accounting students in the undergraduate advanced accounting theory and practice unit, and on average, local students achieve higher final exam scores than international students.

Further univariate tests (ANOVA) were used to test for differences between these two groups in each of the seven questions. ANOVA results indicate significant differences in performance between Australian and Chinese accounting students in three of the seven questions at $p < 0.05$ (Questions 2, 4 and 7). Further analyses on the individual questions are provided in the following sections. Descriptive statistics and the results of the multivariate test and univariate tests for each of the seven questions are reported in Table 2.

TABLE 2

Panel A: Descriptive Statistics of Performance Across Seven Questions for Australian and Chinese Accounting Students

<u>Question (total allocated marks)</u>	<u>Nationality</u>	<u>Mean (Standard Deviation)</u>	<u>N</u>
Q1 (15)	Australian	9.37 (2.310)	203
	Chinese	9.33 (2.235)	460
	Total	9.34 (2.256)	663
Q2 (15)	Australian	10.41 (2.048)	203
	Chinese	9.25 (2.019)	460
	Total	9.60 (2.095)	663
Q3 (15)	Australian	7.26 (3.257)	203
	Chinese	7.20 (3.407)	460
	Total	7.22 (3.359)	663
Q4 (15)	Australian	8.38 (3.343)	203
	Chinese	7.30 (3.159)	460
	Total	7.63 (3.252)	663
Q5 (15)	Australian	8.47 (3.503)	203
	Chinese	8.18 (3.380)	460
	Total	8.27 (3.418)	663
Q6 (15)	Australian	11.98 (3.877)	203
	Chinese	12.56 (3.456)	460
	Total	12.39 (3.597)	663
Q7 (10)	Australian	5.84 (2.795)	203
	Chinese	5.16 (2.716)	460
	Total	5.37 (2.756)	663

Panel B: Results of Multivariate and Univariate Tests for Performance Across Seven Questions between Australian and Chinese Accounting Students

<u>Question</u>	<u>Df</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F</u>	<u>Significance Level</u>
Multivariate Test (Seven Questions)				9.917	0.000***
Univariate Tests:					
Q1	1	0.223	0.223	0.044	0.834
Q2	1	187.193	187.193	45.505	0.000***
Q3	1	0.588	0.588	0.052	0.820
Q4	1	162.007	162.007	15.659	0.000***
Q5	1	11.846	11.846	1.014	0.314
Q6	1	47.605	47.605	3.695	0.055*
Q7	1	65.622	65.622	8.739	0.003***

*** Significant at 1%

* Significant at 10%

Follow-up nonparametric Mann-Whitney U tests also show that significant differences in performance exist between Australian and Chinese accounting students in three of the seven questions at $p < 0.05$ (Questions 2, 4 and 7).

Apart from pre-tertiary educational background, studies examining differences in student tertiary performance have shown that other variables could affect their final results. In particular, prior studies have shown that student GPA also has a significant effect on performance. To determine whether student pre-tertiary educational background is still significant on tertiary final exam performance, we re-examined H_1 by controlling the effects of GPA (i.e. GPA is examined as a covariate together with the effect of students' pre-tertiary educational background). The multivariate test results confirm that significant differences in performance exist between Australian and Chinese accounting students across all seven exam questions (non-tabulated $p = 0.000$). On average, local students achieve higher final exam scores than international students.

Performance of Local and International Students in Theory-based and Practical-based Questions (H_2)

To analyze the results for H_2 , the 7 questions were grouped into theory-based (Questions 1, 2, 3 and 7) and practical-based questions (Questions 4, 5 and 6). When the marks for the four theory-based questions are grouped, the univariate test results indicate significant differences in performance between Australian and Chinese accounting students ($p = 0.001$). However there is no significant difference in performance between Australian and Chinese accounting students in the three practical questions grouping ($p = 0.171$). The results support H_2 and indicate that the difference in final exam performance between local and international students is greater in theory-based questions than in practical-based questions. Descriptive statistics and the univariate test results for the theory-based and practical-based question groupings are reported in Table 3.

Follow up nonparametric Mann-Whitney U tests also show that significant differences in performance exist between Australian and Chinese accounting students in the theory-based question grouping ($p = 0.001$) whilst no significant difference in performance exists in the practical-based question grouping ($p = 0.092$).

To determine whether student pre-tertiary educational background is still significant on tertiary final exam performance, we re-examined H_2 by controlling the effects of GPA. The univariate test results indicate significant differences in performance between Australian and Chinese accounting students in theory-based questions (non-tabulated $p = 0.017$), whilst no significant difference in exam performance exists between Australian and Chinese accounting students in practical-based questions (non-tabulated $p = 0.660$). The results still support H_2 and indicate that the difference in final exam scores between the local and international students is greater in theory-based questions than in practical-based questions.

Performance of Local and International Students in Recall-based and Application-based Questions (H_3)

To test H_3 , theory and practical questions were designed with both recall-based and application-based elements. The three practical questions (Questions 4, 5 and 6) had components of direct calculations (using recall-based formulas) and application-based elements. Question 7 is not included as part of this analysis as it offered a choice of question; also, it is based on issues covered in academic articles and cannot be strictly classified as a direct recall-based or application-based theory question.

TABLE 3

Panel A: Descriptive Statistics of Performance in Theory-Based and Practical-Based Questions for Australian and Chinese Accounting Students

<u>Question (total allocated marks)</u>	<u>Nationality</u>	<u>Mean (Standard Deviation)</u>	<u>N</u>
Theory-based:			
Q1, 2, 3, and 7 (55)	Australian	32.88 (6.880)	203
	Chinese	30.94 (6.930)	460
	Total	31.53 (6.967)	663
Practical-based:			
Q4, 5, and 6 (45)	Australian	28.83 (7.193)	203
	Chinese	28.05 (6.558)	460
	Total	28.29 (6.763)	663

Panel B: Results of Univariate Tests for Performance in Theory-Based and Practical-Based Questions between Australian and Chinese Accounting Students

<u>Question</u>	<u>Df</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F</u>	<u>Significance Level</u>
Theory-based:					
Q1, 2, 3, and 7	1	530.023	530.023	11.085	0.001***
Practical-based:					
Q4, 5, and 6	1	85.940	85.940	1.882	0.171

*** Significant at 1%

To analyse the results for H₃, components of both the theory and practical questions were grouped into recall-based and application-based elements (see Table 4). It was expected that students would generally perform better in recall-based questions (in which assessment components are less difficult) than in application-based questions (in which assessment components are more difficult).

A manipulation check was carried out to determine whether both categories of questions were adequately designed, and whether students performed better across all recall-based questions than across application-based questions. The cumulative mark for all recall-based questions was 49 (theory 21 and practical 28), whilst the mean mark was 32.1 (or 65.5%). The cumulative mark for all the application-based questions was 41 (theory 24 and practical 17) and the mean mark was 23.2 (or 56.6%). The results indicate that students generally perform better in recall-based questions than in application-based questions and also provide evidence that the recall-based and application-based questions were adequately designed for this study.

A multivariate test (MANOVA) was used to determine whether a significant difference in performance exists between Australian and Chinese accounting students across all recall-based and application-based questions. Univariate tests (ANOVA) then tested for differences in each of the questions.

The multivariate test results indicate that a significant difference in performance exists between Australian and Chinese accounting students across all four recall-based theory questions ($p = 0.000$). This result is contrary to our expectation, and the univariate test results indicate that this difference is caused primarily by only one of the four questions (Question 2c: $p = 0.000$). Question 2c asked students to “Outline five benefits of international harmonization of financial reporting”. Though the question is a direct recall-based theory question, full marks were given to students who were able to explain each benefit in detail and provide an example. On average, Australian students (mean 3.77 out of 5) performed better than Chinese students (mean of 3.32 out of 5) on this question.

As expected, the multivariate test results indicate that a significant difference in performance exists between Australian and Chinese accounting students across all four application-based theory questions ($p = 0.000$). The univariate test results indicate significant differences in three of the four questions. No significant difference in performance was observed between Australian and Chinese accounting students in Question 3a ($p = 0.907$). Question 3a was difficult in that it integrated positive and normative accounting theory, and both Australian (mean of 5.55 out of 10) and Chinese (mean of 5.52 out of 10) students had a similar performance. Overall, the results partially support H_3 and show that the difference in final exam performance between local and international students is greater in application-based questions than in recall-based theory questions.

The multivariate test results indicate that no significant difference in performance exists between Australian and Chinese accounting students across all five recall-based (direct calculations using recall-based formulas) practical questions ($p = 0.551$). The univariate test results also indicate that there is no significant difference in any of these five questions. On the other hand, the multivariate test results do indicate a significant difference in performance between Australian and Chinese accounting students across all three application-based practical questions ($p = 0.000$). The univariate test results also indicate significant differences in all three questions. Therefore, the results provide strong support for H_3 and demonstrate that differences in final exam performance between local and international students are greater in application-based questions than in recall-based practical questions. The descriptive statistics and the results from the multivariate test and the univariate tests for each of the questions are reported in Table 4.

Follow up nonparametric Mann-Whitney U tests results were consistent with the univariate test results.

To determine whether student pre-tertiary educational background is still significant on tertiary final exam performance, we re-examined H_3 by controlling the effects of GPA. The multivariate test results indicate that a significant difference in performance exists between Australian and Chinese accounting students across all four recall-based theory questions (non-tabulated $p = 0.000$) and all four application-based theory questions (non-tabulated $p = 0.000$). Furthermore, the multivariate test results indicate that no significant difference in performance exists between Australian and Chinese accounting students across all five recall-based (direct calculations using recall-based formulas) practical questions (non-tabulated $p = 0.315$). On the other hand, the multivariate test results indicate that a significant difference in performance exists between Australian and Chinese accounting students across all three application-based practical questions (non-tabulated $p = 0.000$). Therefore, the results still provide partial support for H_3 and show that the difference in final exam performance between local and international students is greater in application-based questions than in recall-based questions.

TABLE 4

**Panel A: Descriptive Statistics of Performance in Recall-Based and
Application-Based Questions for Australian and Chinese Accounting Students**

<u>Questions (total allocated marks)</u>	<u>Nationality</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>N</u>
Theory Questions				
Recall-Based:				
Q1a (6)	Australian	4.75	0.895	203
	Chinese	4.83	0.823	460
	Total	4.80	0.846	663
Q1c (5)	Australian	1.63	1.234	203
	Chinese	1.70	1.411	460
	Total	1.68	1.358	663
Q2c (5)	Australian	3.77	1.072	203
	Chinese	3.32	0.994	460
	Total	3.46	1.038	663
Q3b (5)	Australian	1.84	0.926	203
	Chinese	1.83	1.011	460
	Total	1.84	0.985	663
Application-Based:				
Q1b (4)	Australian	3.03	1.147	203
	Chinese	2.83	1.148	460
	Total	2.89	1.150	663
Q2a (3)	Australian	1.63	0.597	203
	Chinese	1.37	0.575	460
	Total	1.45	0.594	663
Q2b (7)	Australian	5.12	1.098	203
	Chinese	4.66	1.280	460
	Total	4.81	1.244	663
Q3a (10)	Australian	5.55	2.828	203
	Chinese	5.52	2.895	460
	Total	5.53	2.872	663
Practical Questions				
Recall-Based				
Q4a (3)	Australian	1.76	1.027	203
	Chinese	1.86	1.107	460
	Total	1.83	1.084	663
Q5a (7)	Australian	3.96	2.077	203
	Chinese	3.99	2.079	460
	Total	3.98	2.077	663

(continued)

TABLE 4 (continued)

<u>Questions (total allocated marks)</u>	<u>Nationality</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>N</u>
Q5b (3)	Australian	1.71	0.859	203
	Chinese	1.74	0.852	460
	Total	1.73	0.853	663
Q6a (12)	Australian	10.19	2.883	203
	Chinese	10.56	2.536	460
	Total	10.45	2.650	663
Q6b (3)	Australian	1.95	1.096	203
	Chinese	2.09	1.050	460
	Total	2.05	1.065	663
Application-Based:				
Q4b (6)	Australian	3.65	1.294	203
	Chinese	3.11	1.250	460
	Total	3.28	1.287	663
Q4c (6)	Australian	3.14	2.217	203
	Chinese	2.38	2.325	460
	Total	2.61	2.318	663
Q5c (5)	Australian	2.89	1.478	203
	Chinese	2.56	1.469	460
	Total	2.66	1.479	663

Panel B: Results of Multivariate and Univariate Tests for Performance in Recall-Based and Application-Based Questions Between Australian and Chinese Accounting Students

<u>Questions</u>	<u>Df</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F</u>	<u>Significance Level</u>
Theory Questions					
Recall-Based					
Multivariate test				7.429	0.000***
Univariate tests:					
Q1a	1	0.969	0.969	1.355	0.245
Q1c	1	0.748	0.748	0.405	0.524
Q2c	1	26.750	26.750	25.780	0.000***
Q3b	1	0.005	0.005	0.005	0.943
Application-Based					
Multivariate test				10.463	0.000***
Univariate tests:					
Q1b	1	5.671	5.671	4.308	0.038**
Q2a	1	9.344	9.344	27.618	0.000***
Q2b	1	28.267	28.267	18.780	0.000***
Q3a	1	0.113	0.113	0.014	0.907

(continued)

TABLE 4 (continued)

<u>Questions</u>	<u>Df</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F</u>	<u>Significance Level</u>
Practical Questions					
Recall-Based					
Multivariate test				0.799	0.551
Univariate tests:					
Q4a	1	1.430	1.430	1.218	0.270
Q5a	1	0.137	0.137	0.032	0.859
Q5b	1	0.149	0.149	0.205	0.651
Q6a	1	19.700	19.700	2.812	0.094*
Q6b	1	2.696	2.696	2.381	0.123
Application-Based					
Multivariate test				12.324	0.000***
Univariate tests:					
Q4b	1	39.416	39.416	24.698	0.000***
Q4c	1	79.276	79.276	15.082	0.000***
Q5c	1	15.434	15.434	7.128	0.008***
*** Significant at 1%					
** Significant at 5%					
* Significant at 10%					

Once again, these results reinforce the argument that national pre-tertiary educational background has a significant effect on local and international student performance in Australian tertiary undergraduate courses. As this is a 300 level unit, the results indicate that even after two years of formal tertiary education, significant performance differences still exist between local and international students.

CONCLUSIONS AND IMPLICATIONS

We examine the difference in the academic performance of local and international students in an Australian tertiary institution. Results support the argument that student origin has a significant effect on the performance of local and international students in their undergraduate accounting course. Specifically, there are significant differences in the performance of Australian and Chinese accounting students, and on average local students achieve higher scores in the final exam than international students. Results also show that differences between these two groups are greater in theory-based questions than in practical-based questions. Furthermore, the results indicate that the difference in the final exam performance is greater in application-based questions than in recall-based questions. This difference in student performance is still significant after taking into account the effect of student GPA.

This study provides strong support for the notion that a tertiary student's origin affects their academic performance. The study provides an important insight into factors affecting the

performance of local and international tertiary students and raises interesting theoretical issues. It provides evidence that whilst students in tertiary institutions have equal access to classroom teaching and materials, final exam performance may still depend largely upon where students gain their pre-tertiary education. Tertiary institutions involved in educating both local and international students need to pay greater attention to the student's origin when designing overall course curriculum and content.

To ensure that both local and international students perform in a similar manner in the final exam, tertiary educators need to provide greater "hands-on" experience to students: specifically, how to answer application-based theory and practical questions. Greater consistency in performance between local and international students can be achieved by establishing specific elective courses which focus on developing communication and writing skills: in particular, the ability to interpret and answer various types of critical and analytical-based questions. Tertiary educators can also highlight the difficulties associated with certain types of examination questions that will be assessed in the final exam so that students pay greater attention to these questions in their pre-exam study.

Some limitations of this study need to be recognized. First, this study has examined the difference in performance between local and international students by using only accounting students from two countries enrolled in a 300 level undergraduate unit at an Australian tertiary institution. This may limit the generalizability of the results. Future studies may investigate the performance of local and international students in other courses and tertiary institutions, both in Australia and overseas. Second, this study examines the impact of the pre-tertiary educational background of students, which incorporates the composite effects of national culture, learning approaches and language skills of the students on their performance. Future studies can attempt to detangle the effects of all these variables to provide a richer insight into the factors causing differences in the academic performance of tertiary students. Other variables of a social and environmental nature, and individual student interest, may also help to explain the differences in performance between local and international students which can be examined by future studies.

APPENDIX

Extracts from the Research Instrument

Question One

- (a) What are the main differences between the 'principles-based' approach as opposed to a 'rules-based' approach to standard setting? (6 marks)
- (b) Which type of standard (a principles-based or a rules-based) will be better in overcoming creative accounting practices? Why? (4 marks)
- (c) In what areas is it particularly difficult to restrict creative accounting? (5 marks)

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