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Comparing accounting students' instructional preferences: Australia and Zimbabwe

Abstract

This study examines the instructional preferences exhibited by students in an Australian and a Zimbabwean setting, and how cultural conditioning can reflect in the instructional design choice. Using graphical and textual presentations of an experiment with three instructional designs and 217 undergraduate students, this study empirically examines student understanding of financial accounting in the two countries. Students' performance scores and reported mental effort ratings were used to determine the instructional preference. The findings of this comparative study show that Australian accounting students prefer graph and text designs aligned with a low power distance (PD) while Zimbabwean students prefer graph and text designs associated with a high PD. The sample used in this study came from first-year undergraduate students studying introductory accounting at two different universities from two different countries (Australia and Zimbabwe). The results may not be generalisable to other universities although similar patterns were found to be consistent with students' cultural orientations. In addition, there may be other factors that motivate students' learning and affect their performance and that should therefore be considered. The results suggest that students learning in different cultural contexts learn better with different instructional formats, requiring educators to consider different formats of instructional material. This study is the first to offer accounting educators insights on one major dimension of cultural variation, using instructional material designed according to cognitive load theory principles in a cross-cultural context.

Keywords: accounting, Australian, culture, instructional preferences, Zimbabwean

Comparing accounting students' instructional preferences:

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1. Introduction

Many accounting educators are finding classes filled with students from diverse cultures because of several factors that facilitate student mobility (Sikkema and Sauerwein, 2015). Some have observed that these cultural differences among learners have a major impact on the learning processes. Learner differences are symptomatised by in-class participation in discussions (Kettle, 2017) and student attitude towards professors (Yook, 2013), with implications for developing independent learning skills, the ability to apply knowledge (e.g., Adler and Milne, 1997; Paisey and Paisey, 2005), and approach to problem solving (Joy and Kolb, 2009).

Numerous factors are converging that make learning and teaching in cross-cultural environments a pertinent issue. The continuous expansion of globalisation and world trade is creating more frequent cross-cultural interactions than at any time in the past (Friedman, 2007; Gunn, 2017; Parrish and Linder-VanBerschoot, 2010). Academics and students wishing to stay current or develop specialised skills in a rapidly changing world are demanding access to educational opportunities beyond their national boundaries (Gunn, 2017). Cheaper and simpler communication is stimulating the growing willingness to learn and teach across cultures. However, best practices in one country may not necessarily translate to other cultures (Friedman, 2007). Recent studies report growing cultural diversity, with schools becoming more heterogeneous and multicultural (Pinter, 2017). Nisbett (2003) suggests that deep-rooted cultural values and modes of thinking are difficult to separate from the learning processes. The growing need for educational access leads students to demand culturally adaptive learning experiences that allow the full development of the individual (Parrish and Linder-VanBerschoot, 2010). It is within this context that the present study focused on the two cultures of Australia and Zimbabwe, examining the effects of different instructional design on learners' performance and self-reported difficulty of understanding the instructional material.

A recent study conducted with tertiary accounting students in Zimbabwe showed that guided self-managed instructional design decreased more cognitive load than the conventional split-attention format or the integrated format on a recall and a transfer test (Sithole *et al.*, 2017). A study that examined accounting students in Australia found that interactive instructional formats decrease cognitive load to a greater extent than non-interactive formats (Blaney *et al.*, 2015). Although both studies make distinct contributions to given country-contexts, they omit to examine the societal culture aspect in the instructional design. The study of power distance (PD; the extent to which societal members accept inequalities as the natural order) (Hofstede, 1980, 1991) shows that cultural orientations provide distinct behavioural outcomes. For example, Zimbabwe has a high-power-distance culture and Australia has a low-power-distance culture (Hofstede, 1991). In an Australian classroom, students can challenge ideas, lecturers can be addressed by their first name, and if students are not satisfied, they are encouraged to make their grievances known. The application of the unidimensional model of culture to Africa has been questioned (Adams and Van De Vijver, 2017; Nsamenang and Dawes, 1998). The cultural diversity that characterizes led us to select Zimbabwe for this comparison because it has a relatively homogeneous local culture.

To understand education in Zimbabwe, it is imperative to comprehend the purpose of education in traditional society as it operated before colonisation. In Zimbabwe, children were taught from a very young age to recognise that they are members of an extended family system to which they owe loyalty, respect, and affection (Cuffe, 2017). The educational system was not cut off from the day-to-day experiences of the learner. School and life were intertwined. In most situations, children learned by doing through rituals, demonstration, ceremonies, recitation, and imitation (Fafunwa, 1967). Zimbabwean education focused on teaching everyone how essential community was for one's identity and survival (Tedla, 1995). The emphasis was on instilling a collective rather than individualist orientation.

Australia is now one of the most diverse populations in the world, with over 200 birthplace groups (ABS, 2016). Each of the groups has its own significant cultural mix because of regional and historical differences and the continuous external and internal movements of people. Clearly, one might argue that there is no homogeneity of values with respect to family life in Australia. Despite demographic changes in Australia, the educational system has remained predominantly Anglo-Celtic (Hartley, 1995). Autonomy has been a key feature in the Australian context. Autonomy refers to the individual's capacity to self-direct. It includes the

extent to which an individual can determine his/her own life path or patterns of behaviour (Hartley, 1995). In Australia, people rarely live in extended families, although some extended families are very active (Millward, 1992). In most cases, the narrowest conception of family is used, which refers to a closely related group of people living in the same family. Such a conservative approach to family interpretation is translated into the educational environment. The most dominant trend in Australia's education system has been the reinforcement of intellectual independence.

By contrast, in the Zimbabwean context the core of the child's educational and social existence was the family. It was the nucleus around which the larger community was built. In Zimbabwe, it was the community which gave children their early education, and orientation with the community was more important than individual intellectual performance. Also, quite distinct from the Zimbabwean society is the philosophy of education in Australia which strives towards creative thinking on the part of the individual child, as well as parenting which focuses on the right of a child to be heard (Ivec, 2013).

The present experimental study seeks to identify differences in instructional preferences between Australian and Zimbabwean students because technological developments now enable variation of instructional design in line with students' preferences (Yang *et al.*, 2014), which may assist in overcoming cultural differences that may cause learners' achievement to vary (Oliver and Mathur, 2018). Understanding the preferences of students from different cultures is key to making technology-based education more effective.

Cognitive load theory proposes the management of students' split-attention effect and the self-management effect in learning (Sithole, 2016). It is yet unknown, from a comparative, cross-cultural perspective, how two cultures that differ in Hofstede's power distance cultural dimension learn under split-attention instruction and self-managed instruction. Specifically, the study addresses two questions: 1. Does instructional design lead to differences in learning outcomes measured by student's performance? 2. If there is such difference, which instructional design can decrease students' cognitive load?

The remainder of the paper is structured in the following manner. In Section 2, the theoretical background is presented. Section 3 introduces the participants and study design. Section 4 presents the results followed by the discussion. The last section provides the conclusion.

2. Theoretical background

2.1 Culture and learning

There is increasing evidence that Western educational theories need to be adapted to local cultural features of African countries (Al-Wahaibi and Almahrezi, 2009; Shizha, 2014). Schwier *et al.* (2004) contend that instructional design is a social construct, and a personal understanding of the communities for which the instructional material is intended is important. Studies conducted by Rajaram and Bordia (2011) and Shizha (2014) support this view as they found that teaching Western-based management education to mainland Chinese students in Singapore by adapting learning to local needs can have a profound effect on learning.

This study focuses on one widely used cultural construct, power distance (PD). Concepts related to PD, a major dimension in cross-cultural studies, have been employed to analyse phenomena in management (Farh *et al.*, 2007), media studies (Richardson and Smith, 2007), online learning environments (Celik, 2018; Crossman and Bordia, 2012), psychology (Hu and Judge, 2017), and intercultural education (Triandis, 1984). Triandis (1984) and others (e.g., Richardson and Smith, 2007) argue that there are several dimensions of cultural differences that need to be examined intensively. The present paper is the first that offers educators insights on one major dimension of cultural variation using instructional material that is designed according to cognitive load theory. Cognitive Load Theory (CLT) suggests that efficient learning occurs when the instruction is designed according to human cognitive architecture (Sithole *et al.*, 2017).

Initial evidence suggests that different cultural orientations can play critical roles in how students learn. Students from different societal cultures bring different learning styles (Hutchinson and Gul, 1997; Jackling *et al.*, 2012; Joy and Kolb, 2009). Hutchinson and Gul (1997) showed that societal cultural differences are associated with the ways students analyse knowledge. Joy and Kolb (2009) argued that the culture a person lives in is an inescapable part of the environment in which he or she lives. It influences information processing and cognition (Saxe, 2015). Thus, it is reasonable to believe that cultural socialisation tends to influence learning preferences (Hofstede, 2016; Joy and Kolb, 2009).

When considering cultural influences on learning, we must recognise that there are three levels of culture that influence perceptions and learned behaviour patterns (Jung, 2014). First, cultural traditions distinguish a specific society, for example, beliefs and language. Second, there are subcultural traits such as how people dress, communicate, or relate to each other. Finally, there are cultural universals which relate to learned behaviour patterns that are shared by all of humanity, for example, the organisation of families and social groups, and the establishment of some form of leadership roles. The major challenge in adopting and sharing instructional design across cultures is establishing where cultural universals apply and where subcultures will influence the learning process and the learning outcomes. Cultural factors to a large extent influence not only what is learnt but how to apply different strategies of attention, planning, problem solving, and memory (Kearins, 1986).

Some studies have explored the historical evolution of cultural clusters that transcend national boundaries (House *et al.*, 2004; Joy and Kolb, 2009). Others have focused more narrowly on in-country societal culture, resulting from the development of nation-states bounded by governing structures, law, and social institutions that have increased cultural homogeneity (Hofstede, 2016; House *et al.*, 2004). Hofstede (2016) showed that each member nation's societal culture is unique considering the individual societal culture dimension, although it is possible to cluster member nations by applying a range for a given societal culture dimension.

The body of knowledge about the societal culture as a determinant in learning spans across several disciplines: accounting (Abeysekera, 2008; Sikkema and Sauerwein, 2015), management (Dalton *et al.*, 2015; Ramadan and Joseph, 2015), psychology (Pattaratanakun and Mak, 2015), science (Sugimoto and Swain, 2016), and sociology (Thompson *et al.*, 2016). These studies define societal culture as shared motives, values, beliefs, identities, and interpretations or meanings of significant events resulting from common experiences of members of collectives that are transmitted across generations (House *et al.*, 2004).

Research shows that societal culture influences student learning (Abeysekera, 2008; Nisbett, 2003). Nisbett (2003) showed that deeply rooted societal cultural values influence thinking and students bring those thinking patterns to learning. Nisbett (2003) identifies cultural diversity as being prominent among learners, perhaps owing to deeply rooted cultural values and modes of thinking that are difficult to separate from learning processes. Abeysekera (2008) used

Hofstede's (1980, 2001) cultural dimensions and surveyed 296 students to determine student learning preferences. The findings showed that the length of stay of international students in the foreign university influenced their learning preference. The research concluded that the length of study in the foreign university acclimatised students to the preferred learning format in that societal culture.

2.2 Cognitive load theory, split-attention, and learning

Cognitive load theory (CLT) is based on the assumption that human cognitive architecture consists of working memory with very limited capacity when dealing with new information (Sweller *et al.*, 2011), and unlimited long-term memory in which elements are organised and stored in the form of domain-specific knowledge structures known as schemas (Van Merriënboer and Ayres, 2005). Accessing schemas in long-term memory can reduce working memory load, thereby freeing working memory resources for learning (Choi *et al.*, 2014). One of the loads identified by CLT is extraneous cognitive load, which is the burden imposed on working memory by the way the information is presented or the activities in which the learner must engage (Sweller *et al.*, 2011). This load can result from poorly designed instructional material (Sithole and Abeysekera, 2017).

Many studies have illustrated the importance of instructional material designed with CLT principles in mind. Two of the most researched and latest CLT-derived instructional effects are the split-attention effect and the self-management effect (Sweller *et al.*, 2011; Sithole, 2016). Accounting instructional material requires students to split attention within and across pages to understand concepts, procedures, and applications. In the passive, outside-classroom learning environment, students' societal culture can influence how they deal with split attention and self-manage their learning. Understanding the influence of societal culture on learning allows design instructions that facilitate the societal-cultural inclinations of learning to decrease students' cognitive load.

This study contributes to current understanding by acknowledging that accounting students' studying is influenced by their culture. Accounting learning material is often found in a split format requiring students to split their attention within and across pages in order to understand concepts, procedures, and applications. Students' societal culture can influence how they deal with split attention and self-manage their learning (Sithole and Abeysekera, 2017).

Understanding the influence of societal culture on learning allows instruction designs that facilitate the cross-cultural inclinations of learning to decrease students' cognitive load.

2.3 Cultural constructs

The nation has been used as the unit of analysis several recent cross-cultural studies (e.g., Joy and Kolb, 2009; House *et al.*, 2004). Countries tend to form homogeneous and distinct national clusters. Similar to many studies, we operationalised societal culture in the context of countries. The 'culture clusters' empirically arrived at in the GLOBE study (House *et al.*, 2004) distinctly categorise Zimbabwe and Australia into two separate clusters, 'Sub-Saharan Africa' and 'Anglo' respectively. The decade-long GLOBE study (House *et al.*, 2004) identified the Australian culture under the 'Anglo' (English-speaking) cluster of countries and was characterised by low PD (House *et al.*, 2004). The Zimbabwean culture had high PD (House *et al.*, 2004).

2.4 Power distance

Power distance is the extent to which less powerful members of organisations or institutions in a country accept and expect that power is not distributed equally (Hofstede *et al.*, 2010). Low PD is a cultural feature found in most of North America and Europe, while high PD is a cultural pattern found in Africa, Asia, South America, and the Pacific (Hofstede, 2016). Australia is categorised as a nation with low power distance, while Zimbabwe, an African country, can be described as having high power distance (Abeysekera, 2008). Power distance values determine the communication between those at the bottom and the top of the power pyramid. People in high PD cultures tend to accept inequality in the distribution of privilege and power (Triandis, 1984). Empirical results have shown that, in high-power-distance learning situations, instructors dominate learners, who will be expected to behave in the way they are instructed (Kasuya, 2008). The interaction between students and teachers or among students is limited. In low PD societies, teachers interact with students and students interact with each other more freely and actively.

In high-power-distance societies existing hierarchical differences tend to be perpetuated by creating and following rules that uphold the status quo (Hofstede, 2001). Paternalistic relationships are common among individuals at different levels of a hierarchy in high PD cultures. In classroom situations, some studies have shown that those from high PD cultures

have a lower motivation to improve their foreign-language proficiency, preferring more in-group-centred communication (Peltokorpi and Clausen, 2011).

We attempt to provide extensions to cross-cultural accounting instructional research. First, no known studies on culture and student learning have examined power distance orientation using different instructional design formats. For example, Richardson and Smith (2007) examined the influence of power distance on media choice behaviour. Students from Japan and the US participated in a study on their choice of communication media when dealing with their professors. However, the authors did not consider instructional design, nor did they use materials that were compliant with cognitive load theory. In accounting, Abeysekera (2008) compared the preferred learning modes of international and domestic students. The study found that domestic students from lower-power-distance societies preferred interactive lectures since this allows them to speak up in class and disagree with the instructor.

Abeysekera (2008) did not explore the instructional design format. Zimbabwe is a higher PD country (60) compared to Australia (36) (Hofstede, 2016). Zimbabwean people accept authority as given, but Australian society finds ways of equitably distributing power and if necessary, challenges the status-quo. This cultural dimension shows that Zimbabwean students are likely to accept the status-quo for harmony, whereas Australian students pursue an individualistic path for greater self-expression.

3. Participants and design

Two hundred and seventeen first-year undergraduate students were recruited from a Zimbabwean university (57 males and 56 females, $M = 21.04$ years old, $SD = 2.42$) and from an Australian university (64 males and 40 females, $M = 21.45$ years old, $SD = 3.90$). The response rate was 78.42% and 86.33% from Australian and Zimbabwean participants respectively. Approval for human subject research was obtained from the Human Research Ethics Committee at the two universities. Students participated voluntarily in the study, and they were not paid for participation. They were informed of the study one week prior to the questionnaire being administered. This study only used students whose birthplace was either Australia or Zimbabwe. The questionnaires were initially distributed to all students who attended introductory accounting during class time, regardless of their major or nationality. The responses were collected immediately upon completion. After collection, only students

who were born and studied in either Australia or Zimbabwe were identified, extracted, and used in this research.

At the start, before the questionnaires were distributed, the researchers explained the organisation of the survey and the reasons for it. Students were informed that participation was voluntary and that the results from the experiment were not part of the subject's assessment, and that data collected would be used anonymously. The survey did not solicit respondents' names and their IDs. The students were given participant information sheets and consent forms. They signed the consent form stating their written agreement to take part in the study. Students who agreed to participate completed the questionnaire in class. The participants answered questions about their age, gender, first language, birth country, and knowledge of accounting. This took students 10 minutes to complete. Completion of the rest of the questionnaire took 45 minutes.

A power analysis using the Gpower computer program (Faul *et al.*, 2007) indicated that a total sample of 35 people would be needed to detect large effects ($d = .8$) with 95% power using a t -test between means with alpha at .05. Guided by the minimum sample size to detect large effect sizes, the study randomly assigned participants to one of the three groups. There were 77 students in the split-attention group (Australian group 36, and Zimbabwean group 41), 62 students in the integrated group (Australian group 32, and Zimbabwean group 30), and 78 students in the guided self-management group (Australia group 36, and Zimbabwean group 42).

3.1 Materials and procedure

The instructional materials explained the basic accounting equation, the debit and credit rules, and their effect on the basic accounting equation. The instructional materials were obtained from an accounting textbook (Weygandt *et al.*, 2010, pp. 53-54) in the form of split attention, but formatted as follows for each of the two conditions:

Group 1—split attention: The instructional material (split-attention format) was similar to that found in the textbook. An example of the material used in the current study is illustrated in Figure 1.

Insert Figure 1 here

Group 2—integrated group: The instructional material in Group 2 was presented in a format that integrated the diagram with the text (see Figure 2). The content was reformatted to decrease split attention by bringing the text as close as possible to the diagram (integrating). The integrated material was developed after reviewing the research concerning split attention (e.g., Ayres and Sweller, 2005; Roodenrys *et al.*, 2012). An example of the material used in the current study is illustrated in Figure 2.

Insert Figure 2 here

Group 3—guided self-managed format: Instructional materials were developed in a way that enabled participants to integrate the diagram with the text. An example of the material used in the current study is illustrated in Figure 3. The material contained guidance (as shown in Figure 3). Participants in Group 3 were explicitly asked to implement the guidance before attempting to learn the materials. The techniques for self-management were extensively researched by Roodenrys *et al.* (2012) and can be considered the common, current method of self-managing cognitive load.

Insert Figure 3 here

The participants in the study were required to complete the experiment manually using pencil and paper. The study had three phases: pre-test, the learning phase, and test phase. At the start of the study participants completed a pre-test questionnaire. In the learning phase, the participants were given 15 minutes to review the learning materials. In the test phase, the researcher administered the test that was formatted as a single-sided A4 booklet. The test consisted of 28 recall and 11 transfer items. The participants were given 45 minutes to complete the test. They received two A3 pages of learning materials that contained learning instructions. The learning instructions differed among the three groups. During the test, as they completed the test questions, they were also required to state the mental effort needed to complete the question. The responses helped us to evaluate the extent of two aspects of student performance: recall of learning content and transfer of knowledge by solving problems in different situations. The mental effort ratings helped us to relate to the effort students exerted to attain performance.

A recall question in the test phase required students to write the basic accounting equation. Recall questions compel students to retrieve the acquired knowledge (Carpenter, 2012). An example of a transfer question is: "In May, Company XY records the transaction by a debit to Accounts Receivable for \$10 000 and a credit to Service Revenues for \$10 000. What is the effect of this entry upon the accounting equation for Company XY?" The demands of transfer questions were higher than recall questions and tested the ability to transfer acquired knowledge. Transfer questions expected a student to apply the knowledge acquired during instruction to a new situation (Collins, 2014). Participants provided mental effort ratings after the learning phase and after attempting every question, as outlined by Paas (1992). Participants wrote answers on the blank spaces immediately below the questions. The test booklets were collected soon after the students completed the tasks.

3.2 Pilot study

A pilot study was conducted before the main experiment. The aim of the pilot study was to refine instructional guidance and instructional content, and to estimate the time that participants would take to complete each phase of the study. Three students from Australia and three students from Zimbabwe participated in the pilot study. The six students did not participate in the main study. The time limit, for both the learning phase and test phase, was determined in the pilot study. The time given to complete the test was strictly controlled to avoid the possibility of a systematic difference in processing time between the split-attention and guided self-managed groups. Research has demonstrated that processing time is positively related to recall (Barrouillet *et al.*, 2007).

3.3 Rating of mental effort

After students completed the instructional materials, they were asked to rate the mental effort associated with the learning task. To measure mental effort, this study used Paas and Van Merriënboer's (1994) 9-point subjective rating scale. This is an established scale to measure the level of overall cognitive load (Van Gog and Paas, 2008). Mental effort ratings were solicited from participants at the end of the learning phase and after each question in the test. The ratings on the levels of mental effort were used as the measure of mental effort (Van Gog and Paas, 2008).

3.4 Compliance measures

Compliance was an additional measure included in the analysis for participants allocated to Group 3 (the guided self-managed format) of the study. Compliance refers to the participant's use of the guidance attached to the instructional materials. Evidence of compliance involved examination of the instructional materials (A3 sheets of paper) to determine if participants implemented the instructional guidance provided to participants to assist guided self-management. Participants were considered 'compliant' if they highlighted material with a highlighter, underlined material, or marked circles on keywords with a pencil or pen.

4. Results

4.1 Descriptive statistics

The data were analysed with one-way analysis of variance (ANOVA) with code 1 (i.e., split-attention instruction), 2 (integrated instruction), and 3 (i.e., guided self-managed instruction) representing the levels of the between-subjects factor instructional format, to determine its effects on recall, transfer, and mental effort. These three settings equate to three experiments. The alpha level was set at .05 ($p < .05$) when evaluating tests of statistical significance. To measure effect size, Cohen's d was calculated, with values of .10, .30, and .50 characterising small, medium, and large effect sizes, respectively (Cohen, 1988).

Table 1 reports the descriptive information of the data. To examine comparability between the two countries, this study used a t -test to investigate the differences in age and Chi-square tests to investigate differences in gender and one-way analyses of variance (ANOVA) for knowledge of accounting. The results of these preliminary analyses revealed no significant differences in age ($t = 0.968$, $p = 0.087$), gender ($\chi^2 = 2.703$, $p = 0.10$), and knowledge of accounting ($F(2, 215) = 0.405$, $p = 0.525$) between Australian and Zimbabwean students. Such attributes cleared questions of homogeneity among the student groups.

Insert Table 1 here

Table 2 shows means and standard deviations for performance measures in the experiment based on one-way ANOVAs. Recall scores showed a significant main effect between the split-attention groups: $F(1, 75) = 55.56$, $p < 0.05$, effect size partial $\eta^2 = 0.43$. Mean recall showed that the Australian split-attention group had lower scores than the Zimbabwean group.

Insert Table 2 here

4.2 Split-attention instructional materials

Consistent with expectations, the Zimbabwean split-attention group performed significantly better, $d = 1.671$, indicating a large effect size. The one-way ANOVA for split-attention transfer questions also demonstrated a significant main effect of the group: $F(1, 75) = 52.20$, $p < 0.05$, and effect size partial $\eta^2 = 0.410$. Again, the Zimbabwean students in the split-attention group performed significantly better than the Australian group ($d = 1.66$) on transfer tasks.

4.3 Integrated instructional materials

As shown in Table 3, one-way ANOVA for recall scores showed a significant main effect between the Australian and Zimbabwean integrated groups for the recall test items: $F(1, 60) = 17.258$, $p < 0.05$. The Zimbabwean integrated group performed significantly better than the the Australian group ($d = 1.05$), indicating a large effect size. The one-way ANOVA for transfer questions also demonstrated a significant main effect between the Australian and Zimbabwean groups: $F(1, 60) = 4.339$, $p < 0.05$. The Zimbabwean students in the integrated group performed significantly better than the Australian group ($d = 0.53$), with large effect size.

4.4 Self-management instructional materials

Results of the compliance measures indicated that 92% of the participants in the two guided self-management groups followed the guidance about how to self-manage split attention. Compliance referred to the participant's use of the guidance attached to the instructional materials for the self-management group. Students were considered 'compliant' if they highlighted material with a highlighter, used arrows to link text and diagram, underlined material, or drew circles to mark keywords with a pencil or pen. The means and standard deviations for recall and transfer mental effort rating for the test phase are shown in Table 3. The one-way ANOVA for recall scores showed a significant main effect between the Australian and Zimbabwean guided self-management groups for the recall test items: $F(1, 76) = 52.58$, $p < 0.05$, effect size partial $\eta^2 = 0.409$. The Australian guided self-managed the group performed significantly better than the Zimbabwean group ($d = 1.66$), indicating a large effect size. The one-way ANOVA for transfer questions also demonstrated a significant main effect between the Australian and Zimbabwean groups: $F(1, 76) = 57.70$, $p < 0.05$, and effect size partial $\eta^2 = 0.432$. The Australian students in the guided self-management group performed significantly better than the Zimbabwean group ($d = 1.74$).

5. Discussion

5.1 Students' performance under different instructional formats

Results show that best format for the Zimbabwean students was the integrated learning format. Recall performance is also highest with the integrated format, showing that the integrated format helped Zimbabwean students to perform better with recall memory to perform well in an examination requiring rote memory. Transfer performance is also highest with the integrated format, demonstrating that the integrated format helped Zimbabwean students understand and perform well in an examination requiring critical and reflective thinking. For the mental rating of each question, Zimbabwean students showed less learning difficulty (low mental effort rating) for the short-term learning and long-term learning. Although the split-attention effect is supported by a wide body of research in CLT (e.g., Ayres and Sweller, 2005; Roodenrys *et al.*, 2012), this is the first study to confirm the preferred effects from a cultural perspective. About recall and near-transfer performance, the Zimbabwean students performed better in the split-attention and integrated condition. Australian students were much better in the self-managed condition.

Australian students performed best in their learning with a guided self-managed instructional design. They outperformed Zimbabwean students on a recall test and a transfer test. The measurement of mental effort associated with questions attempted indicated that students in the Australian guided self-managed instructional group reported significantly higher mental effort scores. The Zimbabwean self-management group reported lower perceived mental effort. Mental effort is increased by the need to mentally integrate several sources of information (Ayres and Sweller, 2005), and Australian students reported significantly more mental effort than Zimbabwean students. Australian students are used to the constructivist approach of self-managing their learning, student-centred learning of moving text during the test phase require more mental effort and resulted in better student performance.

The one-way ANOVA results revealed significant preferences between students' learning in the guided self-management and split-attention instructional design. The high performance score for the Australian guided self-management group indicates that students prefer to learn by doing, whereas the high score in the Zimbabwean split-attention group suggests that these students follow the authoritative status-quo in the instructional material. This is consistent with the instructional principles derived from literature which posits that Zimbabwean students are

expected to obey the teacher (Hofstede, 2001; Jambor, 2005). The social and cultural norms combined with the education system promote tacit acceptance rather than active experimentation (Joy and Kolb, 2009). The finding of higher recall and transfer performance by Zimbabwean students in the split-attention group compared to the Australian students can possibly explain students' preference for the traditional instructional method influenced by the societal-cultural setting (Hwang *et al.*, 2008).

5.2 Practical contribution

The key question in this study was whether the societal-cultural context influences learning. This study operationalised the PD dimension of the societal culture construct and instructional formats as manipulated variables in an experimental setting, to predict the influence of PD dimension of the societal culture on the preferred accounting instructional formats. Results suggest that Australian students prefer the self-management instructional format whereas the Zimbabwean students prefer the split-attention instructional format and integrated instructional format, in a cross-cultural (or comparative) context.

This study compared three instructional methods between Australian and Zimbabwean students. Sithole *et al.* (2017) study used Zimbabwean students only and compared the three instructional formats. The single-country study found that Zimbabwean students outperform under self-managed instructional format, and this comparative study shows that Australian students outperform under self-managed instructional format. The two studies together show that Australian students would perform more poorly under split-attention and integrated formats than Zimbabwean students. Australian students will perform better than Zimbabwean students under self-managed instructional format.

5.3 Theoretical contribution

These results demonstrate that although cognitive load theory effects are crucial if students are presented with instructional material not aligned with their own culture in a cross-cultural context, they can experience significant difficulties. As the differences in the Australian and Zimbabwean students have shown, difficulties because the instructional design may be more favourable to one cultural setting than the other. The connections to the societal culture and the instructional format must be aligned under mono-cultural and cross-cultural contexts. Accordingly, accounting educators, especially those working in Australia and Zimbabwe and struggling to maintain student engagement, should consider culturally adaptive and culturally

sensitive instruction. This study provides one such instructional design. If instructional design—and education in general—is a result of social processes (Schwier *et al.*, 2004), then the design of accounting instructional format cannot remain neutral. For accounting instructional material to enhance the learning of students, educators must be cognisant of the cultural context, whether monocultural or cross-cultural, for learning of their students and how those societal cultures manifest themselves in the instructional learning preferences (Nisbett, 2003).

The high PD social hierarchies in the Zimbabwean setting provide individuals with limited freedom to make their own decisions. Zimbabwean students recorded significantly lower mental effort with split-attention and integrated instructional formats. Both formats follow instructor-led teaching. Split-attention format is the authoritative status-quo of the instructional material accepted by Zimbabwean students. However, if the instructional format follows an integrated content design, it becomes the new authoritative status-quo with instructor-led teaching for Zimbabwean students. Australian students performed significantly better than Zimbabwean students in the self-management instructional format. The findings from this study show that different learning formats can have a significant effect on learning through mental effort exerted in learning, in two different comparative cultural contexts.

6. Limitations

The sample used in this study came from first-year undergraduate students studying introduction to accounting at two different universities from two different countries (Australia and Zimbabwe). The results may not be generalisable to other universities, although similar patterns were found to be consistent with cultural orientations. Very few studies have investigated the link between culture and instructional design. Hence there is scope for researchers to investigate similar issues across different countries. In addition, there may be other factors that motivate students' learning and affect their performance and that may need to be considered, such as other institutional and environmental factors prevailing in a country and individual personality factors. It may also be necessary to do a longitudinal study tracking the underlying pattern over time.

7. Conclusion

In evaluating students' performance using three instructional formats and the cultural dimensions lens, this study reveals students' instructional design preferences. The content

presented in an integrated learning format can facilitate learning of Zimbabwean students with a cultural setting of high PD. Australian students with low PD perform best by self-managing their learning in a cross-cultural context. These findings can be useful in designing accounting content where a cross-cultural context occurs, such as an Australian university classroom that has domestic and international students. Instructional preference in one culture may be culturally inappropriate in another. Different instructional formats can facilitate learning in different societal cultures. Future research can investigate the preferred instructional formats in cultural settings that do not represent Zimbabwe and Australia. Future studies could also investigate different instructional formats that enhance student performance besides integrating separate text and diagrams. It should be noted that we operationalised culture as 'nations', but different ethnic groups, regions, or continents may be also be used to denote culture to operationalise future research.

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