

«Note»

# The Effect of Accounting Exercise<sup>®</sup> to Motivate First Year Accounting Students

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## Introduction

The purpose of this study was to investigate the effect of the class activity Accounting Exercise<sup>®</sup> to motivate learners in a first year undergraduate accounting course.

Over the past decade it is becoming more evident that the number of students majoring in accounting has been declining across the globe. For example, the American Accounting Association (AAA) and the American Institute of Certified Public Accountants (AICPA) recently released a report titled “Charting a National Strategy for the Next Generation of Accountants” addressing the issue of declining high-quality candidates in accounting majors (PCAHE, 2012). This report made recommendations to develop strategies on how to attract the best and brightest students to the accounting profession. A similar declining trend in the number of accounting students has also been seen in the literature from countries such as Australia (Baxter & Kavanagh, 2012; McDowall & Jackling, 2010; Jacling & Calero, 2006), New Zealand (Tan and Laswad, 2006; Wells, 2005; Fedoryshyn & Tyson, 2003) and Ireland (Byrne & Willis, 2005). In Asia, Nga and Soo Wai Mun (2013) produced more recent evidence indicating there was a lower percentage of professional accounting members below the age of 30 relative to previous generations in Malaysia. In Japan, it was also reported that the

number of examinees who sat for the Certified Public Accountants (CPA) Exams in 2013 saw a dramatic 40% drop compared with those in 2009 (Minami, 2013).

Under these circumstances, previous research has attempted to identify specific causes for this decline. Two research streams have emerged in the literature. Firstly, several studies have focused on how students' perceptions of accounting have influenced their choice of an accounting major and career perspective. In general, the motivation or intention to pursue a particular career path was thought to be determined by personal and social influences (Ajzen & Fishbein, 1980; Ajzen, 2001). More theoretically, Ajzen (2001) and his associates developed a theory referred to as the "Theory of Reasoned Action (TRA)". They found that behavioural beliefs determined one's motivation to pursue a certain course of action, especially when associated with one's career pursuit including a choice of major to study. Along with the TRA, Tan & Laswad (2006) and Jackling & Keneley (2009) empirically tested the TRA's theoretical construct using samples from their respective countries and found that students seeking an accounting major were influenced by their interest in accounting and positive attitude toward studying accounting. However it has been reported that there is a tendency that university students to date have a negative perception of accounting and perceive it as being too number-oriented and boring (Madsen, 2013; Christensen, 2004; Marriott & Marriott, 2003; Mladenovic, 2000). This is believed to produce a negative effect on their decision to seek an accounting career path (Albrecht & Sack, 2000) or study an accounting major (Allen, 2004; Saemann & Crooker, 1999; Cohen & Hanno, 1993).

Other research undertaken to investigate the decline in accounting student numbers has focused on the impact of the negative stereotype associated with accounting and accountants. Stereotype is defined as the image/s that the public perceive on members of a particular occupational grouping (Hinton, 2000). Previous literature in accounting has reported that the typical negative image or ste-

reotype for an accountant is a professional who is traditionally dull and boring (Albrecht & Sack, 2000; Allen, 2004; Carnegie & Napier, 2010) is numbers-oriented (Maladenovic, 2000; Parker, 2001), were associated with lower prestige (Allen, 2004; Belski et al., 2003) and with lower prosperity (Madsen, 2013). Such negative stereotypical attitudes of the profession were regarded as a serious disincentive, especially among students who would have normally been considered as the best candidates for the future accounting profession (Cohen & Hanno, 1993; Hermanson et al., 1995; Saemann & Crooker, 1999; Mladenovic, 2000; Jackling, 2001; Friedman & Lyne, 2001). More recently, Baxter & Kavanagh (2012) examined this stereotypical view of accountants from the perspective of first year university students studying in an Australian university. Findings demonstrated participants still held the traditional “bean counter” perception of accounting. This prior study also confirmed that creative students tended to perceive accounting as being based more thoroughly on accuracy and detail. The analysis found that students with higher creative ability had a tendency to be more reluctant to major in accounting. Similar results were also found in Byrne & Willis (2005) in Ireland and Saemann & Crooker (1999) in the USA. Accordingly, the traditional stereotypical image of accounting was considered a major drawback that has led to a decline in the number of students undertaking accounting (Richardson & Alcock, 2010; Kavanagh, 2004; Bryne & Willis, 2003; Fedoryshyn & Tyson, 2003; Albrecht & Sack, 2000).

Given this background, the present study attempted to identify and improve the perceptions and stereotypical images of accounting and accountants in order to motivate student learning in an introductory accounting courses at the tertiary school. Prior studies have also presented ways to improve individuals’ perceptions and stereotypical image of accountants by using several tentative techniques and materials. These have included colorful and inspirational recruitment brochures and websites designed by accounting firms (Jeacle, 2008), implementing

various business simulation games and innovative learning settings within the accounting course (Marriott, 2004; Tanner & Lindquist, 1998), organizing direct contacts/mentoring with qualified accountants (Wells, 2013), inviting guest speakers into the classrooms (Metrejean et al., 2002) and so on.

In this current study, the authors introduced to their students the innovative teaching resource known as Accounting Exercise<sup>®</sup> with the aim of improving their students' learning motivation. By introducing the Accounting Exercise<sup>®</sup> into lectures, students were provided with a chance to participate in fancy physical exercises relating to basic accounting concepts. Previous studies argued that using various types of teaching resources in class motivate student learning (e.g. Meehan-Andrews, 2009). In addition, Wittberg et al. (2009) presented evidence to conclude that direct physical exercises have a positive effect on one's academic performance. Similar to Wittberg et al. (2009), this present research was interested in examining the effects of implementing a special teaching resource of Accounting Exercise<sup>®</sup> in an attempt to change students' stereotypes and perceptions of accountants, and consequently encourage their learning motivation.

To summarise, the purpose of this study was to investigate the effect of the Accounting Exercise<sup>®</sup> on accounting perceptions and learning motivation by students in a first year undergraduate accounting course in Japan. Following this introductions, the paper outlines the theoretical frameworks applied to this research, which also incorporates the development of our research question. This is followed by sections on the research design and the results of the analyses. Discussion arising from the analyses then follows. The final section of the paper discusses limitations of the study and recommendations for future research.

## **Theoretical Framework & Research Question Development**

### ***1) Learning Style and Learning Motivation***

Previous literature has often reported on the number of students switching

from accounting into other subjects at the university level (e.g. Madsen, 2013; Warren & Parker, 2009; Fedoryshyn & Tyson, 2003; Albrecht & Sack, 2000). Accounting is not alone with this trend where a similar phenomenon has also occurred and previous research has attempted to ascertain the reasons for this movement. For example, Seymour & Hewitt (1997) investigated students' reluctance to seek professional careers in science and identified three primary reasons. These reasons included issues surrounding the classroom environment, instructor teaching styles and the process of instructional selection. In the research that followed there was a focus on students' learning styles in association with learner motivation.

The present study applied this Learning Style approach as being one of our theoretical frameworks. Historically many researchers have advocated the theoretical definition of Learning Styles (e.g. Dunn, et al., 1989; Canfield, 1988; Kolb, 1984; Keefe, 1979). Their research commonly identified Learning Styles as cognitive, affective and physiological behavior that serve as relatively stable indicators on how learners perceive, interact with and respond to ones' learning environment. One prominent area of research in Learning Styles has been the investigation on how to apply alternate modes of learning for students' in their actual learning environment. Accordingly, researchers have attempted to study Learning Styles in an effort to improve the efficiency and effectiveness of instructional materials and methods (Zapalska & Dabb, 2002). Literature found that individuals would be motivated when taught with strategies and resources that complement ones' preferred learning styles (e.g. Diaz & Cartner, 1999; Fleming, 1995).

For example, some studies examined how particular types of new technologies (e.g. internet, distance learning and computer-aided learning) influence students' learning. These studies have found differences in learning outcomes between students who prefer (and benefit from) learning in technology grounded courses to those who prefer learning in more traditional instructor based courses (e.g. Diaz

& Cartnar, 1999; Ross, 1999; Grasha, 1994). Felder (1993) and Felder & Silverman (1988) explored data from science students and these two studies clearly articulated the usefulness of learning style analysis when considering the diversity of students' learning styles preference. Their goals were to capture how teaching strategies in the classrooms did or did not regularly provide access to students with various learning style preferences. Similarly, Tanner & Allen (2004) examined the case where the majority of science students had recently changed their major after first year and indicated a teaching style that derived from multiple pedagogical approaches. In other words they found that there was not a singular approach available in order to retain students' interest in science. This study demonstrated that an instructor's diverse teaching and pedagogical approach would provide students with opportunities to exploit their different learning style during the course.

Given this theoretical framework, the present study hypothesized that typical learning information and modality in the accounting classroom might attract particular types of students into accounting but distract others who preferred different learning styles. Prior studies have empirically confirmed that accounting major students have traditionally been attracted to this field because of their analytical appetites for structure, mathematical theory and rules (e.g. Giordano & Rochford, 2005; Loo, 2002; Biberman and Buchanan, 1986). Alternatively, it might be said that students who are interested in accounting have a skewed preference toward a peculiar Learning Style focusing on memorizing accounting rules, standards or calculating numbers. Therefore, these findings might indicate that students with alternate Learning Styles are not attracted by the ordinal type of teaching/learning approach that accounting has traditionally offered.

Given this prior literature, this current research attempted to implement a resource known as accounting Exercise<sup>®</sup> in the accounting classroom which could motivate students who possessed a variety of Learning Style preferences. It

is hoped that such an attempt might assist to increase the number of students studying accounting majors.

Previous studies have suggested strategies to cater for multiple learning styles in the classrooms in order to improve the quality of teaching and effectiveness of learning within diverse groups (Meehan-Andrews, 2009; Dobson, 2009; Wehrwein et al., 2007; Slater et al., 2007; Lujan & DiCarlo, 2006). Meehan-Andrews (2009) for example attempted to determine the benefits obtained from using different teaching/learning styles among first year health science students in an Australian university. Using a questionnaire-based survey, the author investigated the association between students' perceptions of their course learning experience and their learning style preference as measured by the VARK test. The VARK test, which was originally invented by Fleming (1995), allows us to categorize ones' preferred learning style into four groups. These are Visual; Aural; Read/Write; and Kinesthetic (Fleming, 1995). The finding of the study indicated the participants expressed an improvement in their learning confidence after their course experiences that included various teaching methods. The author concluded that instructors should have attempted to alter their teaching methods so students who possessed different learning styles were given equal opportunities to learn in an environment that was more conducive to their preferences.

Wittberg et al. (2009) also studied the effects that physical exercise had on one's academic performance in terms of being a useful teaching resource. The study's participants were students from a local high school (ie not university students) and the authors investigated which aspect/s of fitness assessment were associated with students' performance across the four academic areas, these being Mathematics, Reading/Language Arts, Science and Social Studies and used the standardized academic performance test known as the West Virginia Educational Standards Test (WESTEST) to confirm their positive findings. The results of these prior studies confirm our hypothesis that by implementing the Accounting

Exercise<sup>®</sup>, which provides students opportunities to perform physical exercises in their course of study, would enhance their motives or academic performance in an accounting course.

In contrast, Hsieh et al. (2012) found no significant relationship between students' preferred learning style or their course performance. This study examined the effect of particular learning style preference on test scores and Grade Point Averages (GPA) among students enrolled in an introductory biomechanics course at several universities in the USA. The result found no statistical evidence to support the interaction between academic performance and students' preferred learning styles. This conclusion supported previous research undertaken by Baykan & Nacar (2007), Dobson (2010) and Pashler et al. (2008). Such literature might imply the passive interpretation of our hypothesis that inclusion of particular types of teaching material such as Accounting Exercise<sup>®</sup> may not improve students' learning motivation and their resulting academic performance. Given these arguments, the current study adds value to this area of study in an attempt to narrow the controversial gap appearing in the literature.

## ***2) Stereotype Theory and Learning Motivation***

Another theoretical framework applied to this present study is the stereotype theory. We have seen in the literature the stereotype for a traditional accountant and this stereotypical image has been widely regarded as the primary cause for the decline in the number of accounting students (e.g. Richardson & Alcock, 2010; Kavanagh, 2004; Byrne & Willis, 2003; Fedoryshyn & Tyson, 2003; Albrecht & Sack, 2000). This traditional image is also referred to as the "bean counter" stereotype (Carnegie & Napier, 2010; Friedman & Lyne, 2001). In concrete terms, this stereotype brings to the profession a perception of it being dull, boring, colourless, excessively fixated with money, pedantic, uncommercial and shabby (Jeacle, 2008; Friedman & Lyne, 2001).



In contrast, other related research has shown a new stereotype of accountants is emerging (e.g. Carnegie & Napier, 2010; Baldvinsdottir et al., 2009; Jeacle, 2008). For example, Carnegie & Napier (2010) explored how book commentators analyzed the stereotypical role of accountants in the aftermath of the Enron collapse. Twenty seven authors have written on the Enron demise and in particular describing accounting stereotypes in the manuscripts. In their conclusion, many of these authors have indicated the traditional accounting stereotypical “bean counters” is being eroded and now accountants were evolving into business professionals with forthright, independent and respectable characteristics. Similarly, Baldvinsdottir et al. (2009) explored the changing image of accountants as seen in the discourse used in accounting software advertisements that were appearing in the professional publications of the Chartered Institute of Management Accountants over the last four decades. The authors of this study revealed that accountants in the 1970s–80s were depicted as being responsible and rational people, while in the latest decade accountants were perceived as being more hedonistic in their advertisements. Further, Jeacle (2008) was interested in the recruitment discourse in the brochures and website published by accounting firms and professional bodies. Their research examined promotional/recruitment material for the big four firms and six professional institutes and discovered that accounting firms and professional bodies were consciously constructing images of colourful characters in order to reshape the stereotypical representation of them boring and grey suited bookkeepers.

Reshaping the traditional stereotype of an accountant however presents a big challenge as it can create a double-edged sword. Carnegie & Napier (2010) and Baldvinsdottir et al. (2009) for example contended that the hedonistic and colourful image now portrayed of accountants has often created serious concerns in terms of their integrity and trustworthiness. Carnegie & Napier (2010) criticized the latest image of accounting as the profession serving the public indi-

rectly by helping enhance the efficiency of capital markets and creating employment opportunities for accounting graduates. The authors believed that it is more likely that Accountants were there to provide advice that enhanced social welfare indirectly through their emphasis on assisting corporate profit maximization. They pointed out that this strong tendency of client-orientation had caused a lack of integrity and competence for the profession in the eyes of the public. Accordingly, there is a strong need to maintain a healthy balance between both the traditional view and colourful images now being portrayed of the modern day Accountant.

Several attempts have been undertaken by professional accounting bodies and firms to change one's stereotype or perception of an accountant. This has met with limited success due to this difficult balance of the stereotype images. Jeacle (2008) observed the continuous effort of constructing the images of colourful characters in the promotional materials by the professional bodies and firms that certainly help attract the best and brightest accounting candidates. However on the flip side of this they have also alerted us to the fact that such intentional camouflages of accountants might also incur a heavy future cost in terms of losing their professionalism, credibility and integrity. Furthermore, Well (2013) examined how direct contact with accountants influenced the stereotypical perceptions people have of accounting. In this study, the perceptions of sixteen people who had no previous contact with accountants were compared with another sixteen people who had been the recipients of information from accountants. Analyzing the data collected via a questionnaire and interviews, the author found that although direct contact might assist in changing one's view towards accountants, the change would not necessarily have the intended effect and did not always alleviate stereotypical traditional perceptions of an accountant.

Given the above previous studies, the present study attempts to add to the image of accounting as being a little more colourful and with a hedonistic flavor

compared to traditional views by using Accounting Exercise<sup>®</sup> in order to retrieve the popularity of accounting among first year university accounting students. The idea of integrating innovative physical exercise with an accounting course was in part due to students' peak experience; an experience originally coined by Maslow (1962). Peak experience is recognized as the moment of highest happiness and fulfillment where an individual recognizes a level of psychological experience that surpasses the usual level of intensity, meaningfulness and richness (Maslow, 1962). The peak experience in one's life is very important in education because abnormal circumstances encourage one's intrinsic learning (e.g. Vallerand et al., 1992; Csikszentmihalyi, 1975).

In the literature, the link between motivation, intrinsic learning and fun has often been referred to in game-based learning studies (e.g. Huizenga, et al., 2009; Barab, et al., 2005; Garris, et al., 2002). Garris, et al. (2002) for instance reviewed prior literature on simulation and gaming to elaborate a model for instructional games and learning. In conclusion, their study confirmed that a motivated learner showed a clear interest in the subject matter, giving them an incentive to try harder and to be more consistent over time (Garris, et al., 2002). Other than virtual game-based learning, Stinson (1997) focused on dance as a physical exercise and conducted an interpretive study on middle school students investigating what caused their engagement or non-engagement in a dance educational environment. Upon analyzing interviewed data from participants, Stinson (1997) found a significant role that pleasure and enjoyment had for dance education and strategies should be employed to encompass this. This prior study also confirmed the importance of peak experience to enhance one's learning engagement particularly through the use of physical exercises.

Following the above theoretical framework, this current study has created a quasi-peak experience by using Accounting Exercise<sup>®</sup> in first year accounting courses where students are normally taught technical book-keeping and calcula-

tion skills. The opportunity to incorporate Accounting Exercise<sup>®</sup> would provide students with a peak experience during their ordinal course which often just gives monotonous lectures and pencil-pushing exercises. This special experience may help students change their traditional stereotype views of accounting and simultaneously enhance their learning motivation. This study also considered a possible drawback of negating the colourful and hedonistic stereotypical image of Accountants when using particular resources such as Accounting Exercise<sup>®</sup> as argued by Carnegie & Napier (2010), Baldvinsdottir et al. (2009) and Jeacle (2008) above. This will be further discussed in the research design and methodology sections found in the next section of this paper.

### **3) Research Questions:**

Given the above literature review, this study formulated the following two Research Questions.

*RQ1: Does Accounting Exercise<sup>®</sup> improve the motivation toward the study of accounting among first year accounting students?*

*RQ2: Does Accounting Exercise<sup>®</sup> improve learning performance among accounting students?*

Considering the two theoretical frameworks mentioned above, this study focused on the effect of physical exercising in an elementary accounting course using Accounting Exercise<sup>®</sup> in an attempt to enhance students' motivation toward learning. The major goal was to determine if such an activity assisted in attracting and retaining their academic interest in accounting (RQ1). In addition, we also examined whether students' motivation was enhanced by Accounting Exercise<sup>®</sup> and whether this would actually be reflected in a change in their actual

learning action and academic outcomes. The research addressed this second question by investigating whether *Accounting Exercise*<sup>®</sup> improve students' learning performance with regard to memorizing basic but specific accounting jargon in this accounting discipline (RQ2).

## Research Design

### *1) Data Collection*

Participants of this study comprised first year undergraduate students enrolled in an introductory accounting course at a middle size Midwestern University in Japan. This course provided credit for compulsory basic accounting and book-keeping studied over 15 weeks.

Lecturers of five classes (from a total of eight) agreed to participate with their students and conducted this research activity. Initially 234 students from these five classes voluntary participated, however the number of effective responses was 223 (a 95.2% effective response rate) due to their incompleteness of the questionnaire.

This research applied a quasi-experimental research method in an attempt to investigate the impact of intervention on changes to participants' learning motivations and their subsequent achievement. For this purpose, each of five classes was randomly assigned into either an experimental group or into a control group. In the experimental group, 90 participants from the two classes actively participated in a 15-minute physical exercise using "Accounting Exercise<sup>®</sup>" at the commencement stage of lectures over three consecutive weeks (See Figure 1).

This intervention group also watched a video on the TV monitor in their classroom to the music of Accounting Exercise<sup>®</sup> with accompanying lyrics that aligned to basic accounting jargon (See Appendix 1). In the Accounting Exercise<sup>®</sup> classroom (ie the AE student group), two additional instructors showed students how to follow exercises and lyrics over a 15 minute duration. Instruc-



**Figure 1. Accounting Exercises<sup>®</sup> in the classroom**

tional materials and illustrations created by the researchers were also displayed on the white board at the front of the classroom as students played out the exercise (See Figure 2). In contrast, the other 113 participants from the remaining three classes were assigned as the control group (Non AE student group) and did not participate in the Accounting Exercise<sup>®</sup> over the same three weeks. It should

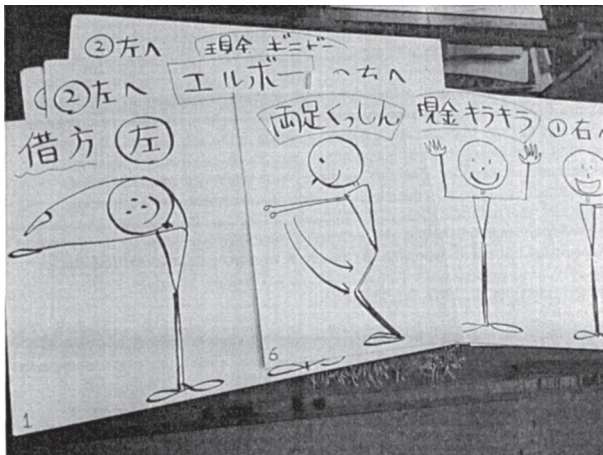
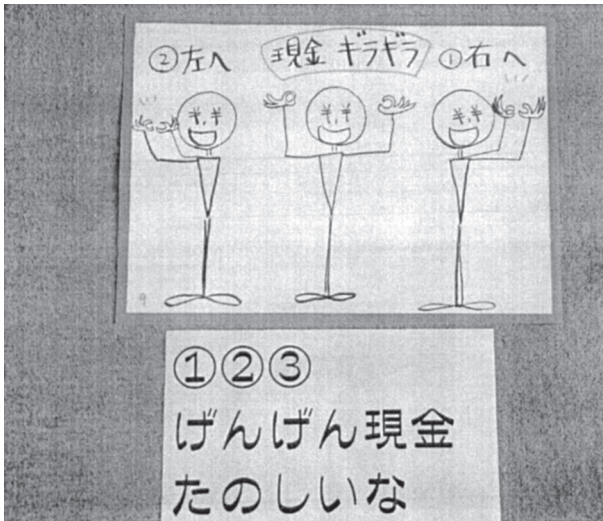


Figure 2: Instructional Materials and Illustrations

be noted here that all students both the experimental and control groups were informed about the Accounting Exercise<sup>®</sup> via a one-page handout that provided a brief introduction, history and access to this resource and included the inventor's

website (<http://www.yamasaki-cpa.com/taisou/index.html>), YouTube® ([http://www.youtube.com/watch?v=B8ApJ5krf\\_U](http://www.youtube.com/watch?v=B8ApJ5krf_U)) and the lyrics of Accounting Exercise®. The lyrics of Accounting Exercise® was originally created in Japanese and translated into the English version by the chief researcher of this study (See Appendix 1).

The researchers chose Accounting Exercise® for this study as it was considered an innovative intervention resource created by a Certified Public Accountant, Mr. Takahiro Yamazaki, who run his own accounting firm in Japan (<http://www.yamasaki-cpa.com/taisou/index.html>). The background to his creation originated from his strong desire to attract people into accounting and business by using fun activities. This Accounting Exercise® activity was chosen as it matched the authors' research proposal of investigating the effects to students' motives and achievement by using stimulating resource material. From the preferred Learning Styles perspective, Accounting Exercise® was a unique intervention using song and physical exercise that may even inspire other students possessing different Learning Styles. From the stereotype theory perspective, Accounting Exercise® was regarded as a suitable activity to create one's peak experience in the accounting classroom by creating a colourful image of accounting. Using creative lyrics and physical movements, Accounting Exercise® could provide students unique learning environment compared to the traditional methods. Nevertheless, Accounting Exercise® was not too radical as it still presented the key messages on how accounting is used to manage businesses and personal finance (See Appendix 1). In this respect Accounting Exercise® overcame the drawback of using colourful and hedonistic stereotypes as argued in some prior studies (e.g. Carnegie & Napier, 2010; Baldvinsdottir et al., 2009; Jeacle, 2008).

Distributing the one-page Accounting Exercise® handout to both AE and Non AE student groups was necessary as the primary purpose of this study was to address the impact of students' learning experience in the classroom as applied by



peak experience and different teaching/learning styles, rather than the influence of superficial information on the handout.

Pre-testing and Post-testing were undertaken with students from both groups to measure the effect of the intervention by using a self-developed questionnaire instrument. These took place on May 10<sup>th</sup> 2013 and June 7<sup>th</sup> 2013 respectively (See Table 1).

The demographics of the participants are displayed in Table 2. Data for this was collected during the pre-test and sought details on a age, gender, domestic or

**Table 1: Quasi Experimental Approach**

Student Group	AE student (Experimental Group)	Non AE student (Control Group)
Intervention	Students with Accounting Exercise <sup>®</sup> (90 participants from two classes)	Students without Accounting Exercise <sup>®</sup> (133 participants from three classes)
Research Schedule		
Week 1 (10 <sup>th</sup> May 2013)	1) Pre-test	1) Pre-test
Week 2 (17 <sup>th</sup> May 2013)	1) Teaching a normal lecture 2) Disseminating a handout document on Accounting Exercise <sup>®</sup> 3) Conducting for 15 minutes Accounting Exercise <sup>®</sup> Video and Instruction at the beginning of the class	1) Teaching a normal lecture 2) Disseminating a handout document on Accounting Exercise <sup>®</sup>
Week 3 (24 <sup>th</sup> May 2013)	1) Teaching a normal lecture 2) Conducting for 15 minutes Accounting Exercise <sup>®</sup> Video and Instruction at the beginning of the class	1) Teaching a normal lecture
Week 4 (31 <sup>th</sup> May 2013)	1) Teaching a normal lecture 2) Conducting for 15 minutes Accounting Exercise <sup>®</sup> Video and Instruction at the beginning of the class	1) Teaching a normal lecture
Week 5 (7 <sup>th</sup> June 2013)	1) Post-test with Mini Quiz	1) Post-test with Mini Quiz

international student status, degree of their aspiration for accounting related jobs and their interest in accounting. Students' response for Accounting Job Aspiration and Interest in Accounting were measured using a five-point Likert scale, and was anchored one for strongly disagree and five for strongly agree. Several preliminary analyses were also applied to compare differences in terms of each demographic factor between students in the AE and Non AE groups. A Mann-Whitney U test revealed significant differences in the age between AE students (Md = 18.00, n = 90) and Non AE students groups (Md = 18.00, n = 133) with  $U = 5123.5$ ,  $z = -2.676$ ,  $p < .01$ ,  $r = .179$ . The median score for age was higher in

**Table 2: Descriptive Information**

	AE students	Non AE students	Total	Preliminary Tests
Number of students	90 (40.4%)	133 (59.6%)	223 (100.0%)	
Average Age (Std. Dev.)	18.60 (1.782)	18.18 (.672)	18.35 (1.255)	MWR <sup>a</sup> = 5123.5
Min	18	18	18	$z = -2.676$ (.007)***
Max	32	23	32	$r = .179$
Median	18.00	18.00	18.00	
Gender				
Male	68 (75.6%)	79 (59.4%)	147 (65.9%)	$\chi^2 = 5.539^b$ ( $p = .019$ )
Female	22 (24.4%)	54 (40.6%)	76 (34.1%)	$\Phi = -.167$ **
Students Status				
Domestic Students	87 (96.7%)	130 (97.7%)	217 (97.3%)	$\chi^2 = .004^b$ ( $p = .947$ )
International Students	3 (3.3%)	3 (2.3%)	6 (2.7%)	$\Phi = .033$
Accounting Job Aspiration <sup>d</sup>	2.93	2.98	2.94	$-.499^c$
(Std. Dev.)	(.871)	(.871)	(.886)	(.618)
Interest in Accounting <sup>d</sup>	3.56	3.50	3.53	$.472^c$
(Std. Dev.)	(.874)	(.877)	(.874)	(.637)

<sup>a</sup> Applied Mann-Whitney U test, because the data violated the assumptions for a parametric test.

<sup>b</sup> Applied Chi-square test. Assumption check was conducted and found no violation.

<sup>c</sup> Applied t-test, Equal variance was assumed. Other assumptions were also checked and found to have no other violations.

<sup>d</sup> Five point Likert Scale was used and anchored participants' responses from one (strongly disagree) to five (strongly agree).

\*\*\* significant difference at the level of .01, \*\* significant difference at the level of .05

the AE student group.

Furthermore, a Chi-square test demonstrated significant differences in the frequency of gender between the AE and Non AE student groups ( $\chi^2(1, n = 223) = 5.539, p = .019, \phi = -.167$ ), with the number of female students being significantly higher in the Non AE group relatively to AE group. These two attributes left open questions of homogeneity between the two student groups and must not be ignored in the following primary analysis.

### **Questionnaire Development**

The current research designed a questionnaire to explore the two research questions developed in the above section – ie RQ(1) Does Accounting Exercise<sup>®</sup> improve motivation toward accounting courses among first year accounting students and RQ(2) Does Accounting Exercise<sup>®</sup> improve learning performance among first year accounting students with regard to memorizing basic accounting terms? For this research purpose, this study prepared the following questions to administer the questionnaire-based survey.

#### ***1) Motivation***

Firstly, the Course Interest Survey (CIS) was used to measure participants' motivation in the present research setting. The CIS is a situational measure of individual's motivation towards a particular instructional setting (Keller, 2010). Originally, the CIS instrument was developed in correspondence with a theoretical foundation represented by the Attention-Relevance-Confidence-Satisfaction (ARCS) Model and designed to measure students' reactions to classroom instruction (Keller, 2010; 1987). In Japan this instrument has been translated from the original English version into a Japanese version and released to the public (Suzuki & Fellows, 2010). The present research used the translated version to ensure reliability. In this study, participants' motivation for the course was mea-

sured by using pre- and post-test with the CIS instrument. The CIS instrument consisted of 34 items that measured each of the four components of the ARCS model of learning motivation. For example, the attention construct included the question 'The instructor knows how to make us feel enthusiastic about the subject matter of this course'. Students responded by using a five-point Likert scale and anchored one for Not True and five for Very True. Each of four ARCS components were calculated both at the pre- and post-test stage and compared differences between scores in each construct at two measurement points in order to figure out shifts of their course motivation by implementing Accounting Exercise<sup>®</sup>.

## ***2) Mini Quiz***

Secondly, a Mini Quiz test was designed to examine how Accounting Exercise<sup>®</sup> consequently impacted on student learning outcomes. If the impact of this intervention would be effective to change students' motivation, then this influence might or might not improve their actual learning outcomes and achievements (e.g. Wittberg et al., 2009; Hsieh et al., 2012; Huizenga et al., 2009). The data collected from this item was used to address RQ2 on whether Accounting Exercise<sup>®</sup> helped students memorize basic accounting jargon as portrayed in the lyrics of Accounting Exercise<sup>®</sup>. This Mini Quiz was administrated at only the Post-test stage. The Quiz format was fill-in-the-blank type and asked participants to answer 10 questions (See Figure 3). For example, the quiz asked students to answer questions relating to basic technical accounting terms such as Debit, Credit, Assets, and Liabilities. All these terms were included int the lyrics of Accounting Exercise<sup>®</sup> where 10-marks was the maximum mark a student could attain. It was considered that the higher the mark a student obtained from this Mini Quiz, the more effectively he/she performed academically.

**Figure 3: Mini Quiz**

The right side of ( ) of Balance Sheet is technically called ( ), while the left side of this statement is called ( ). Assets stand for a set of items listed on the ( ) side of the Balance Sheet. Examples of these items are ( ) and ( ). Liability on the other hand is a group of items listed on the ( ) side of the Balance Sheet. These examples include ( ) and ( ). Shareholder Equity is the group of items listed on the ( ) side of the Balance Sheet such as ( ).

### ***3) Demographic Items***

In the final section of the questionnaire, participants were asked demographic attributes relating to age, gender, domestic or international student status, degree of students' aspiration for accounting related jobs and their interest in accounting. The responses from these questions were used to statistically describe participants and to measure homogeneity between AE and Non AE student groups.

## **Results**

### ***Primary Findings***

Initially the Wilcoxon Signed rank test was conducted to measure the effect of the Accounting Exercise<sup>®</sup> on student's motivation between the pre- and the post-test stage. Table 3 shows the result of this research. In the analysis, each of the four Keller's CIS indices was used to investigate the effect of this intervention for both AE students (Panel A) and non AE students (Panel B) respectively. Regarding AE students (Panel A), no statistical significant changes were found across any of the four indices ( $z = -.613$  and  $p = .540$  for Attention;  $z = -.067$  and  $p = .946$  for Relevance;  $z = -1.049$  and  $p = .294$  for Confidence;  $z = -.738$  and  $p = .460$  for Satisfaction). In contrast, results for three of the CIS indices for non AE students (Panel B, Table 3), were significantly lower in terms of Attention ( $z = -3.481$ ,  $p < .001$ ,  $r = .216$ ), Relevance ( $z = -3.737$ ,  $p < .001$ ,  $r = .232$ ) and

**Table 3: Result from Wilcoxon Signed Rank Test<sup>a</sup>**

Panel A: Results for AE Students

Non AE students (133)						
CIS Index	Mean (Std. Dev.)		50 <sup>th</sup> Percentiles		Wilcoxon Signed Rank Test	Effect size
	Pre-Test	Post-Test	Pre-Test	Post-Test	Z (p-value)	r
Attention	26.80 (4.72)	27.00 (4.84)	26.00	27.00	-.613 (.540)	0.045
Relevance	32.05 (5.33)	32.21 (5.64)	32.00	33.00	-.067 (.946)	0.005
Confidence	28.02 (3.84)	27.74 (3.90)	28.50	28.00	-1.049 (.294)	0.078
Satisfaction	29.60 (4.45)	29.57 (4.93)	30.00	30.00	-.738 (.460)	0.055

Panel B: Results for Non AE Students

Non AE students (133)						
CIS Index	Mean (Std. Dev.)		50 <sup>th</sup> Percentiles		Wilcoxon Signed Rank Test	Effect size
	Pre-Test	Post-Test	Pre-Test	Post-Test	Z (p-value)	r
Attention	25.99 (4.85)	25.23 (4.93)	26.00	25.00	-3.481 (.000)***	.216
Relevance	33.03 (5.33)	31.76 (4.98)	33.00	32.00	-3.737 (.000)***	.231
Confidence	27.72 (4.19)	27.28 (3.81)	28.00	27.00	-1.278 (.201)	.078
Satisfaction	29.03 (4.82)	27.89 (4.58)	28.00	28.00	-3.190 (.001)***	.199

<sup>a</sup> To compare CIS index score between Pre- and Post-test, the Wilcoxon Signed rank test was performed, because the data of this study violated the assumptions in the Paired Sample t-test, which requires a normal distribution of scores between the Pre- and Post-test. No assumption violations for non-parametric analysis were found within this data set.

\*\*\* significant difference at the level of .01

Satisfaction ( $z = -3.190$ ,  $p = .001$ ,  $r = .199$ ). These effect sizes were all considered relatively moderate. No significant difference was found in the Confidence index between the two student groups ( $z = -1.278$ ,  $p = .201$ ).

Cronbach's reliability alphas were applied to the responses from both the pre- and post-tests. The pre-test scores were .814 for Attention, .812 for Relevance, .624 for Confidence, and .710 for Satisfaction while the post-test scores were .797 for Attention, .807 for Relevance, .600 for Confidence and .735 for Satisfaction. In general, a score greater than .700 is deemed acceptable. The results for Confidence at both the pre- and post-tests were slightly lower than the acceptable

level. However some previous studies have accepted similar low scores (e.g. Jones, et al., 2012). The alpha scores for the other items were all found to be close (or slightly higher) to the generally acceptable score of .700.

Secondly, this study applied the Mann-Whiney U test in order to measure the differences in the scores of the mini quiz at the post-test stage between the AE and Non AE student group. In Table 4, this test revealed significant differences in the scores of the mini quiz between AE students (Md = 87.11, n = 90) and Non AE students (Md = 128.85, n = 133), with U = 3744.50, z = -4.933, p < .001 and r = .233. According to the result, the Non AE student group had a higher mean rank in their mini quiz score compared to the AE student group.

Thirdly, additional Wilcoxon Signed Rank tests were conducted to investigate potential effects caused by specific differences in tutor attributes on the study's model. In this research setting, the two experimental rooms (Classroom A and B) and the three control classrooms (Classroom C, D and E) were taught by five different tutors. These five tutors comprised one female and four males. In terms of their age, two were in their 30s, one in their 40s, one in their 50s and one in their 60s. It was thought that differences in tutors' personal attributes (eg age, gender, teaching ability etc) might affect the change in students' motivation and their Mini Quiz score regardless of the effect of the Accounting Exercise<sup>®</sup>. The result

**Table 4: Mann-Whitney U Test for the Mini Quiz scores**

Mini Quiz Score Neab (Std. Dev.)		50% Percentile		Mann-Whitney U Z (p-value)	Effect size r
AE student (Number)	Non AE student (133)	AE student (90)	Non AE student (133)		
6.91 (2.48)	8.36 (2.397)	7.00	10.00	3744.50 -4.933 (.000)***	.233

<sup>a</sup> To compare scores of the mini quiz between AE students and Non AE students, the Mann-Whitney U test was performed, because the data of this study violated the assumptions of an independent t-test, which requires the mini quiz scores for the two student groups should be normally distributed. No assumption violations for the non-parametric analysis were found in this data set.

\*\*\* significant difference at the level of .01

**Table 5: Wilcoxon Signed Rank Test Results across the Different Classrooms<sup>a</sup>**

Panel A: Results from Classroom A (Experience Group)

AE Students in the Classroom A (50)						
CIS Index	Mean (Std. Dev.)		50 <sup>th</sup> Percentiles		Wilcoxon Signed Ranks Test	Effect size
	Pre-Test	Post-Test	Pre-Test	Post-Test	Z (p-value)	r
Attention	26.20 (4.915)	26.58 (5.190)	26.00	26.50	-.814 (.416)	.115
Relevance	30.98 (5.096)	31.46 (5.940)	31.00	31.50	-.640 (.522)	.009
Confidence	27.32 (3.727)	27.02 (3.496)	27.00	27.00	-.997 (.319)	.140
Satisfaction	28.41 (4.206)	29.15 (5.394)	29.00	29.00	-.399 (.690)	.057

Panel B: Results from Classroom B (Experience Group)

AE Students in the Classroom B (40)						
CIS Index	Mean (Std. Dev.)		50 <sup>th</sup> Percentiles		Wilcoxon Signed Ranks Test	Effect size
	Pre-Test	Post-Test	Pre-Test	Post-Test	Z (p-value)	r
Attention	27.55 (4.414)	27.52 (4.385)	27.00	28.00	-.042 (.967)	.006
Relevance	33.43 (5.389)	33.17 (5.149)	34.00	33.00	-.551 (.582)	.088
Confidence	28.90 (3.855)	28.65 (4.239)	29.00	29.00	-.570 (.569)	.090
Satisfaction	31.02 (4.370)	30.10 (4.331)	31.50	30.00	-1.63 (.103)	.257

Panel C: Results from Classroom C (Control Group)

Non AE Students in the Classroom C (48)						
CIS Index	Mean (Std. Dev.)		50 <sup>th</sup> Percentiles		Wilcoxon Signed Ranks Test	Effect size
	Pre-Test	Post-Test	Pre-Test	Post-Test	Z (p-value)	r
Attention	24.21 (4.117)	23.65 (3.996)	25.00	24.00	-1.613 (.107)	.235
Relevance	31.56 (5.048)	30.08 (3.589)	32.00	30.00	-2.53 (.004)***	.411
Confidence	26.04 (4.487)	26.21 (3.056)	26.00	26.00	-.501 (.616)	.073
Satisfaction	27.04 (4.487)	26.35 (3.504)	27.00	27.00	-1.304 (.192)	.194

Panel D: Results from Classroom D (Control Group)

Non AE Students in the Classroom D (42)						
CIS Index	Mean (Std. Dev.)		50 <sup>th</sup> Percentiles		Wilcoxon Signed Ranks Test	Effect size
	Pre-Test	Post-Test	Pre-Test	Post-Test	Z (p-value)	r
Attention	24.57 (4.808)	23.97 (5.681)	24.00	24.00	-1.500 (.134)	.237



Relevance	32.02 (5.815)	30.17 (5.589)	32.00	29.00	-2.778 (.005)***	.433
Confidence	28.00 (4.585)	26.38 (4.084)	28.00	26.00	-.431 (.005)***	.431
Satisfaction	29.85 (5.337)	27.77 (5.590)	28.00	27.00	-3.200 (.001)***	.505

Panel E: Results from Classroom E (Control Group)

Non AE Students in the Classroom E (40)

CIS Index	Mean (Std. Dev.)		50 <sup>th</sup> Percentiles		Wilcoxon Signed Ranks Test	Effect size
	Pre-Test	Post-Test	Pre-Test	Post-Test	Z (p-value)	r
Attention	29.58 (3.718)	28.43 (3.507)	29.00	28.00	-3.144 (.002)***	.503
Relevance	35.97 (3.915)	35.60 (3.568)	36.50	36.00	-.370 (.711)	.060
Confidence	29.40 (3.462)	29.50 (3.441)	29.50	29.00	-.116 (.908)	.018
Satisfaction	30.52 (3.867)	29.84 (3.852)	30.00	29.00	-1.083 (.279)	.175

<sup>a</sup> To compare CIS index score between Pre- and Post-test, Wilcoxon signed rank test was performed, because the data of this study violated the assumptions of Paired Sample t-test, which requires that the difference between scores between Pre- and Post-test should be normally distributed. No assumption violations for non-parametric analysis were found in this data set.

\*\*\* significant difference at the level of .01

\*\* significant difference at the level of .05

of this is presented in Table 5. According to this result, no statistical changes were found among the four indices for Classroom A ( $z = -.814$  and  $p = .416$  for Attention;  $z = -.640$  and  $p = .522$  for Relevance;  $z = -.997$  and  $p = .319$  for Confidence;  $z = -.399$  and  $p = .690$  for Satisfaction) or for Classroom B ( $z = -.042$  and  $p = .967$  for Attention;  $z = -.551$  and  $p = .582$  for Relevance;  $z = -.570$  and  $p = .569$  for Confidence;  $z = -1.63$  and  $p = .103$  for Satisfaction). This result revealed no significant change in AE students' motivations regardless of attribute differences among the tutors.

In contrast, significant results were discovered in Panel C, D and E (Table 5). These results arose among the three control groups for Non AE students. According to the result, the scores for Relevance and Attention were significantly lower in Classrooms C ( $z = -2.53$ ,  $p < .01$ ,  $r = .411$ ) and Classroom E ( $z = -3.144$ ,  $p < .01$ ,  $r = .503$ ), respectively. Three CIS index were also significantly lower for stu-

dents in Classroom D in terms of Relevance ( $z = -2.778$ ,  $p < .01$ ,  $r = .433$ ), Confidence ( $z = -.431$ ,  $p < .01$ ,  $r = .431$ ) and Satisfaction ( $z = -3.200$ ,  $p < .01$ ,  $r = .505$ ). These effect size were all considered to be relatively moderate. Among these three classroom of Non AE students, at least one CIS index presented a significant result, which indicated a tutor's specific attribute would not affect students' motivation levels between the pre- and post-test stage.

Finally, a one-way between-group Analysis of Variance (ANOVA) was performed to explore the impact of different tutors on Mini Quiz Score (see Table 6). The analysis found a significant difference at the .01 level in Mini Quiz Score for the five groups;  $F(4, 218) = 11.655$ ,  $p < .01$ . The effect size, calculated using eta squared, was .176. Post-hoc comparisons using the Turkey HSD test indicated that the mean score for Classroom A (Mean = 5.82, S.D. = 2.126) was significantly different from the other four classrooms (Mean = 8.28, S.D. = 2.219 for B; Mean = 8.31, S.D. = 2.808 for C; Mean = 8.21, S.D. = 2.435 for D; Mean = 8.59, S.D. = 1.789 for E). The score for Levene's test on homogeneity of variances was .345, which did not violate the homogeneity of variance assumption for one-way ANOVA. The results found that the score for Classroom A was the only one being significantly lower and indicated that it displayed strong impact factors that caused students' Mini Quiz Score to be lower but not from the Accounting Exercise<sup>®</sup> itself.

### ***Additional Analysis Result***

The gender effect on the model for this study was also examined because the demographics of the participants reported significant difference in gender between the AE and Non AE student groups. If a unique profile would be found only in the female AE students groups, then significant gender effect was likely to have a crucial impact to the prime analysis results as shown in Tables 3 and 4. For this purpose, each of AE and Non AE student groups were further classified

according to their gender. Four Wilcoxon Signed Rank test were separately performed to investigate any changes in the four Keller's CIS Indices (See Appendix 2). The analysis indicated no significant gender impact on the Accounting Exercise<sup>®</sup>. In the same manner, additional statistical analysis was undertaken to investigate gender effects on the Mini Quiz scores (see Appendix 3). Participants were divided by their gender and two Mann-Whitney U tests were performed separately for each gender group to determine if there were any differences in the Mini Quiz scores between AE and Non AE students. The results of these two tests demonstrated significant difference in the scores of the Mini Quiz between AE students for both the male and female student groups (see Appendix 3 Panel A for male and Panel B for female in Appendix 3). This indicated that there were no significant impact of gender on our primary finding.

Similar to a possible gender effect, this study also examined the role that participants' age may have on the Accounting Exercise<sup>®</sup>. For this analysis the Spearman's correlation coefficient was used to check for any significant relation-

**Table 6: One-way ANOVA Test for Mini Quiz Score for each Classroom**

Classroom	A	B	C	D	E	Total
Category	Experience	Experience	Control	Control	Control	
(No. of Students)	(49)	(43)	(50)	(40)	(41)	(223)
Lecturers' Gender	Female	Male	Male	Male	Male	
Lecturers' Age	30s	40s	60s	50s	30s	
Mean Score of Mini Quiz (Std. Dev.)	5.82 (2.126)	8.28 (2.219)	8.31 (2.808)	8.21 (2.435)	8.59 (1.789)	7.78 (2.528)

<sup>a</sup> Levene's Test of Homogeneity of variance was .345, which was more than .05. This meant no violation for the assumption of one-way ANOVA.

<sup>b</sup>  $F(4,218) = 11.655$ , P-value < .01 (.000)\*\*\* with significant between groups at the level of .01.

<sup>c</sup> Turkey HSD was applied to examine post-hoc comparisons, which found the mean score for Classroom A (Mean = 5.82, S.D. = 2.126) was significantly different from other four classrooms (Mean = 8.28, S.D. = 2.219 for B; Mean = 8.31, S.D. = 2.808 for C; Mean = 8.21, S.D. = 2.435 for D; Mean = 8.59, S.D. = 1.789 for E).

ship between students' age and Keller's CIS Indices and Mini Quiz scores. The results in Appendix 4 reported that only the two variables of Confidence (Pre-test) and Confidence (Post-test) was significant at the 5% and 1% level respectively, but the strength of the relationship of age with these two variables was too weak ( $r = .137$  for Confidence (Pre-test);  $r = .240$  for Confidence (Post-test)). The other variable were all reported as having no significant relationships with age. As a consequence, possible Age bias on the research model for this study was also rejected.

### Discussion

The findings of this research firstly indicated the Accounting Exercise<sup>®</sup> positively impacted on the learning motivation among the first year accounting students. Although motivation as measured by Keller's CIS did not show an improvement it was maintained in the AE student group, while motivation for Non AE students without Accounting Exercise<sup>®</sup> was dramatically lower as shown in the statistical evidence (see Figure 4).

The Accounting Exercise<sup>®</sup> used in this study supported prior studies that reported multiple teaching approaches implemented in a course enhanced students' learning motivation (e.g. Dobson, 2009) and their intrinsic interest of the

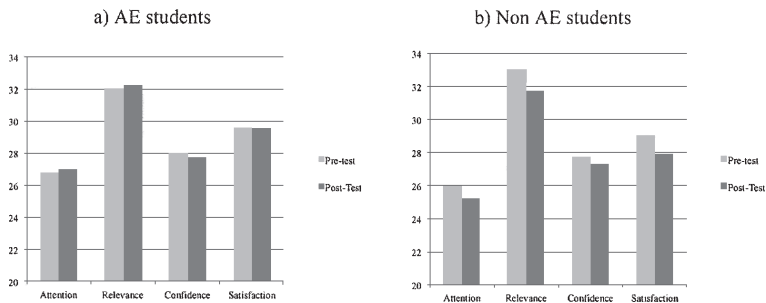


Figure 4: Result of CIS

subject (e.g. Tanner & Allen, 2004). In addition, students' peak experience from using creative physical exercises, such as those provided by the resource of Accounting Exercise<sup>®</sup>, has proven to maintain students' motivation of learning accounting. This finding is also consistent with previous studies that peak experience encouraged one's intrinsic learning (Vallerand et al., 1992; Csikszentmihalyi, 1975; Maslow, 1962). However our findings demonstrated that the significant changes were not found in the indices of Confidence for neither the AE or Non AE groups (See Table 3). Meehan-Andrews (2009) previously provided evidence that multiple teaching approaches and resources in a course of instruction improved students' learning confidence, but the present study failed to support the effect of accounting Exercise<sup>®</sup> in terms of such Confidence.

With regard to the effect from different tutors, our analyses reported no significant changes in motivation among AE students from the two different experimental classrooms A and B, whereas at least one score from the four CIS indices presented a significant drop for Non AE students taught by three different tutors from control groups C, D and E (see Table 4). This finding indicated that the significant result of changing motivation was not the result of individual tutor's personal attributes which included their teaching skills, experience or other background characteristics. This evidence again confirmed the effectiveness of Accounting Exercise<sup>®</sup> in terms of inspiring robust learning engagement in a first year accounting classroom.

In contrast, it was found that the Mini Quiz scores for AE student groups were significantly lower than those for the Non AE groups (see Table 4). With regard to the interaction between the effect of Accounting Exercise<sup>®</sup> and students' academic performance, no consensus has been found in the literature to support this (e.g. Hsieh et al., 2012; Dobson, 2010; Wittberg et al., 2009; Meehan-Andrews, 2009; Baykan & Nacar, 2007). Wittberg et al. (2009) did stress the significant and positive effects of physical exercise on one's academic performance, but this

current study failed to confirm this possible association. Further analysis of a tutor's effect on the Mini Quiz scores discovered that the mean score of Mini Quiz for Classroom A was lower than those of the other four classrooms. The finding than mean scores of Mini Quiz from the other four classrooms were all around 8.0 (see Table 5) and therefore indicated that the lower Mini Quiz scores achieved in Classroom A was not due to Accounting Exercise<sup>®</sup> but rather were due to the impact of other attributes. This was particularly evident because the score for the experiment groups of Classroom B was 8.28 which was statistically equivalent to those scores from the other three control groups from classrooms C, D and E. Accordingly, it was found that the effect of Accounting Exercise<sup>®</sup> was indifferent from students' academic test performance. In the literature, Hsieh et al. (2012) reported a similar finding of there being no significant relationship between students' preferred learning styles and their academic test score which included GPA.

In terms of the stereotype theory, it was interpreted that such a "colourful" image of Accounting Exercise<sup>®</sup> successfully helped change students' motivation (except for Confidence) but failed to reflect this effect on actual academic score as shown by the Mini Quiz results. It was not observed if the increases in students' learning motivation among AE student groups were associated with the level of the Mini Quiz scores. For this to have had a positive effect on the Accounting Exercise<sup>®</sup> findings then the mean score of the Mini Quiz for AE students (Classroom A and B) should have been higher than those of Non AE students (Classroom C, D and E).

Two controversial interpretations may have arisen from this outcome. Firstly, Accounting Exercise<sup>®</sup> might not provide a strong enough stimulus to improve student actions. Such physical exercise in the pencil-pushing classroom might become a double-edged sword as it could create a pleasant situation for a certain group of students but on the other hand could disturb the academic tension of

another group of students (i.e. Zapalska & Dabb, 2002; Grasha, 1994). Jeacle (2008) contended that the hedonistic stereotype of accountants as business professionals carries its own stigma of dishonesty and lack of respectability. Certainly, too colourful an image of accounting may have the opposite effect and cause an attention loss to another group of students. It may also be thought that a consecutive three-week implementation of Accounting Exercise<sup>®</sup> made students bored and negated the effect of this intervention. From the authors' observations of students' exercise activity, it was found that almost all students in the classrooms voluntarily moved their bodies and sang the song with smiles and fun in the first week but then some students seemed reluctant to perform exercises and song in the latter weeks of the study. Due to the trait of this intervention, it was interpreted that some students might fail to develop their peak experience from Accounting Exercise<sup>®</sup> and so be discouraged to some extent in learning accounting. It was implied that for a tutor to perform an effective teaching approach and use meaningful material to inspire students' learning was a very complex issue.

Secondly, the impact on a student's course of action when using Accounting Exercise<sup>®</sup> might not be so obvious in the short term. A longer time period may be required in order to reflect on students' academic performance or enhancement of their intrinsic interest in accounting. Prior studies also pointed out the advantages of lectures to achieve academic performance rather than other types of pedagogies. The literature suggests that lectures are quite efficient pedagogies to enhance one's understanding of terminology, factual knowledge, basic concepts and principles compared to simulations and games (Anderson & Lawton, 2009). Using physical exercise to improve academic performance was not the primary aim in this research setting but rather the aim was to attract as many young students as possible into accounting. Academic outcomes could be improved later in life if students could get serious with engaging in and learning accounting. This is why enhancing the motivation of learning accounting is so important. Accord-

ing to the literature, young people have a tendency to choose their career based on pre-conceived ideas, insufficient information and inaccurate perceptions about occupations and work environments (Greenhaus, 2000; Hildebrandt, 2000). Following this construct, some previous studies have suggested academics need to design and deliver courses that provide a stimulating educational environment that has a long lasting and positive influence on students' perceptions of accounting (e.g. Baxter & Kavanagh, 2012). From this perspective, this current study found that students' learning motivation in an introductory accounting course was successfully maintained by using a resource such as Accounting Exercise<sup>®</sup>, and this would hopefully encourage students not to switch their major to another discipline and simultaneously encourage them to seek a profession in accounting.

### **Conclusion**

The present study aimed to examine the effect of the teaching resource of Accounting Exercise<sup>®</sup> on learner's motivation in a first year undergraduate accounting course in a Japanese university. The findings presented empirical evidence that Accounting Exercise<sup>®</sup> was an effective tool to maintain learning motivation among tertiary participants. Instead of maintaining a higher learning motivation for AE students learning motivation as measured by CIS was found to be statistically decreased among Non AE students who did not participate in the Accounting Exercise<sup>®</sup> tool. Only students confidence was an exception and the change in this motivation attribute was not influenced by Accounting Exercise<sup>®</sup>.

This was the first research study undertaken to apply the innovative teaching resource of Accounting Exercise<sup>®</sup> in order to enhance one's learning motivation and academic performance through the functions of style preferences and peak experience in the learning environment. Based on these theoretical frameworks students' learning motives generated by the intervention were interpreted as the stimuli to change their perceptions and stereotypes towards the accounting pro-



fession which must have been very important for first year students as they prepare for a career in accounting. This effect was also thought to contribute to reducing the declining numbers of students in accounting majors.

This study successfully proved the effect of one particular teaching intervention, but investigating other teaching resources is another research interest that should be followed up in the future. This is because the use of simulation and gaming approaches for teaching and learning in higher education has received increasing attention in recent times (e.g. Lean et al., 2006; Feinstein, 2001). Similar to Accounting Exercise<sup>®</sup>, various simulation games and experimental settings are thought to motivate students to participate in educational activities to a greater degree than they would in a traditional setting because of improving their attitudes towards subjects and providing them with fun activities (Anderson & Lawton, 2009; Albrecht, 1995).

In contrast, this research failed to demonstrate the significant interaction between the inclusion of innovative pedagogy of Accounting Exercise<sup>®</sup> and students' actual academic performance in an introductory accounting course. As previous studies have suggested, lectures might be a more efficient medium to disseminate terminology, factual knowledge, basic concepts and principles to the students in the classrooms than the pedagogies focusing on enhancing learner' motives (Anderson & Lawton, 2009). This study has left open room to explore the processes of reflecting cognitive change of students' motives generated by a resource such as Accounting Exercise<sup>®</sup> to actual learning outcomes and achievement.

From a methodological point of view, the present study used data collected from only one University in Japan and at a particular point of time. Data should be extended into a more longitudinal and diverse nature to add to credibility. Another implication was that this research used only first year accounting students who just commenced their learning of accounting and excluded those who

had previously studied accounting in secondary schools. It would be interesting to examine the initial effect on perceptions and stereotypes through the use of Accounting Exercise<sup>®</sup> by students who had previously studied elementary accounting. Such expansion of the present research would assist us to confirm the generalisability of our findings. Other data collection methods could add substance such as qualitative data collecting techniques such as interviews and observations. Similarly a mixed method approach using both qualitative and quantitative data would also add value by triangulating our findings.

Nevertheless, this study has successfully proved via empirical evidence the positive effect that Accounting Exercise<sup>®</sup> provides to inspire learner motivation. This evidence should assist tertiary curriculum designers in accounting address the recent decline in students studying an accounting major and at the same time provide a higher quality and fun educational environment for our learners.

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Appendix 1: Lyric of Accounting Exercise<sup>®</sup>

Part 1

Debit on the Left, Credit on the Right, Both sides are balanced.

What items are on the Assets?

Cash, Jewelries, Works of Art, Condominiums, Lands and Vehicles.

Add these items on the left when they increase.

I am glad with Cash.

Salary, Bonus and Dividends

I am happy with Cash.

Let's add up more cash and save them!

Part 2

Debit on the Left, Credit on the Right, Both sides are balanced.

What items are on the Liabilities?

Mortgages, Auto Loans, Short-term and Long-terms Debt.

Add these times on the right when they increase.

I am glad with Cash.

Replace short-term debit into long-term Debt

I am happy with Cash.

Let's pay as we go!

Part 3

Debit on the Left, Credit on the Right, Both sides are balanced.

What items are on the Shareholder's Equity?

Capital and Surplus. Strengthen your company!

Add these times on the right when you get profit.

I am glad with Cash.

Tax Planning is important to keep your happiness.

I am happy with Cash.

Then you would be happier for your life and work!



Appendix 2: Gender Analysis Results from Wilcoxon Signed Rank Test<sup>a</sup>

Panel A: Result for Male Students

AE students (68)						
CIS Index	Mean (Std. Dev.)		50 <sup>th</sup> Percentiles		Wilcoxon Signed Ranks Test	Effect size
	Pre-Test	Post-Test	Pre-Test	Post-Test	Z (p-value)	r
Attention	26.42 (4.399)	26.58 (4.656)	26.00	27.00	-.359 (.720)	0.030
Relevance	31.55 (5.135)	31.51 (5.005)	32.00	32.00	-.381 (.703)	0.032
Confidence	27.61 (3.797)	27.25 (3.435)	27.50	27.00	-1.247 (.212)	0.106
Satisfaction	29.26 (4.150)	28.95 (4.466)	29.00	29.00	-1.765 (.077)	0.151

Panel B: Result for Male Non AE Students

Non AE students (79)						
CIS Index	Mean (Std. Dev.)		50 <sup>th</sup> Percentiles		Wilcoxon Signed Ranks Test	Effect size
	Pre-Test	Post-Test	Pre-Test	Post-Test	Z (p-value)	r
Attention	26.37 (4.536)	25.81 (4.339)	27.00	26.00	-2.652 (.008)***	.216
Relevance	33.11 (5.720)	31.98 (5.309)	34.00	32.50	-2.794 (.005)***	.225
Confidence	28.48 (3.977)	27.69 (3.780)	29.00	28.00	-1.928 (.054)	.153
Satisfaction	29.25 (4.918)	28.46 (4.645)	29.00	28.00	-2.056 (.040)**	.170

Panel C: Result for Female AE Students

Non AE students (22)						
CIS Index	Mean (Std. Dev.)		50 <sup>th</sup> Percentiles		Wilcoxon Signed Ranks Test	Effect size
	Pre-Test	Post-Test	Pre-Test	Post-Test	Z (p-value)	r
Attention	27.95 (5.559)	28.27 (5.302)	29.00	29.50	-.794 (.472)	.121
Relevance	33.66 (5.790)	34.59 (6.870)	36.00	36.50	-1.122 (.262)	.171
Confidence	29.27 (3.807)	29.27 (4.881)	29.00	29.00	-.022 (.983)	.003
Satisfaction	30.68 (5.149)	32.00 (5.932)	30.00	32.00	-1.301 (.193)	.198

Panel D: Result for Female Non AE Students

Non AE students (53)						
CIS Index	Mean (Std. Dev.)		50 <sup>th</sup> Percentiles		Wilcoxon Signed Ranks Test	Effect size
	Pre-Test	Post-Test	Pre-Test	Post-Test	Z (p-value)	r
Attention	25.11 (5.293)	24.23 (5.529)	24.00	24.00	-2.277 (.023)**	.222

Relevance	32.80 (4.686)	31.46 (4.595)	33.00	31.00	-2.645 (.008)***	.259
Confidence	26.62 (4.312)	26.58 (3.707)	26.00	26.00	-.587 (.557)	.057
Satisfaction	28.62 (4.658)	27.13 (4.381)	28.00	27.00	-2.578 (.010)***	.252

a To compare CIS index score between Pre- and Post-test, Wilcoxon signed rank test was performed, because the data of this study violated the assumptions of Paired Sample t-test, which requires that the difference between scores between Pre- and Post-test should be normally distributed. No assumption violations for non-parametric analysis were found in this data set.

b The result demonstrated that the mean rank scores of Attention, Relevance and Satisfaction were decreased from pre-test to post-test regardless of gender difference for Non AE students at the 5% of significant level (Panel B and D). Confidence index also showed same pattern of significant change between male and female Non AE student group. Contrast to other three indices, this index was not significantly faded down from pre-test to post-test point even though participants were not provided Accounting Exercise<sup>©</sup> in their accounting courses. Furthermore, the results for all mean rank scores for both male and female AE student groups reported no significant difference before and after participation of Accounting Exercise<sup>©</sup> (See Panel A and C).

\*\*\* significant difference at the level of .01

\*\* significant difference at the level of .05

### Appendix 3: Gender Analysis Result for Mann-Whitney U Test

#### Panel A: Result for Male Student

	Mean (Std. Dev.)		50% Percentile		Mann-Whitney U Z (p-value)	Effect size r
	AE student (68)	Non AE student (79)	AE student (68)	Non AE student (79)		
Mini Quiz Score	6.60 (2.58)	8.38 (2.366)	7.00	10.00	1601.50 -4.360 (.000)***	.359

#### Panel B: Result for Female Student

	Mean (Std. Dev.)		50% Percentile		Mann-Whitney U Z (p-value)	Effect size r
	AE student (22)	Non AE student (54)	AE student (22)	Non AE student (54)		
Mini Quiz Score	7.86 (1.859)	8.33 (2.599)	8.50	10.00	424.00 -2.056 (.040)**	.169

a To compare each factor between AE female students and Non AE female students, Mann-Whitney U test were performed, because the data of this study violated the assumptions of independent t-test, which requires that scores of each factor for two student groups should be normally distributed. No assumption violations for non-parametric analysis were found in this data set.

\*\*\* significant difference at the level of .01

\*\* significant difference at the level of .05

Appendix 4: Correlation Analysis Result for Age

	N	Spearman's rho value	P-value
Mini Quiz Score	222	-.036	.591
Attention (Pre)	219	.115	.089
Attention (Post)	218	.126	.063
Relevance (Pre)	218	.086	.205
Relevance (Post)	219	.131	.053
Confidence (Pre)	219	.137	.042**
Confidence (Post)	221	.249	.000***
Satisfaction (Pre)	218	.070	.306
Satisfaction (Post)	214	.097	.156

<sup>a</sup> To examine correlations between Age, Mini Quiz Score and CIS index, Spearman's correlation analysis test was performed, because the data of this study violated the assumptions of Pearson's parametric test, which requires that scores of each factor should be normally distributed. No assumption violations for non-parametric analysis were found in this data set.

\*\*\* significant difference at the level of .01

\*\* significant difference at the level of .05