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AN EMPIRICAL STUDY OF EMOTIONAL INTELLIGENCE AND STRESS IN COLLEGE STUDENTS

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ABSTRACT

A growing body of research indicates that emotional intelligence is an important factor for student success. In this paper, we examine the relationship between emotional intelligence and stress. Consistent with our hypothesis, we found a significant relationship between one dimension of emotional intelligence (use of emotions) and stress. We also found that age and gender impacted emotional intelligence and stress. Findings from this study have implications for students and universities.

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KEYWORDS: Emotional Intelligence, Stress, College Students

INTRODUCTION

A growing body of empirical research addresses the impacts of stress on individuals in work and educational settings (e.g., Brougham, Zail, Mendoza and Miller, 2009; Hunter and Thatcher, 2007; Rafferty and Griffin, 2006). Cynkar (2007) estimated that workplace stress costs approximately $300 billion each year. College students are a group of individuals who are particularly prone to stress (e.g., Darling, McWey, Howard and Olmstead, 2007). Further, there is a well-documented connection between stress and illness (e.g., Roddenberry and Renk, 2010). Given the challenges that stress creates for employees, students and workplaces, it is worth examining factors that might impact how students cope with stress. Several recent studies have suggested that students' levels of emotional intelligence (EI) may impact their ability to effectively manage stress.

Although there has been significant research on intelligences beyond memory and problem solving (Thorndike and Stein, 1937, Piaget, 1954/1981, Wechsler, 1940), Goleman's (1995) best-selling book, Emotional Intelligence, ignited the attention of management researchers seeking to determine the power of non-cognitive intelligence to predict or explain organizational phenomena. EI has been defined in many ways, but the concept has generally focused on the ability to manage one's own emotions and the emotions of others to assist in one's thinking, action and decision-making (Salovey and Mayer, 1990, Cherniss, 1999).

While ambitious claims have been made about EI's impact on organizational outcomes like performance, recent research indicates that EI may be a building block for emotional competence that combines or interacts with other factors leading to performance (Goleman, 1998, Mayer, Salovey and Caruso 2000, Gowing, 2001). This study aims to address one of the significant relationships in organizations by examining EI and stress. EI plays a strong part in the abilities that people have in using stress to motivate themselves and their ability to control the stress, as opposed to allowing it to take control of their behavior (Goleman, 1998). Stress in the workplace has been linked to absenteeism, higher turnover and decreased efficiency (Sunil, 2012). Stress also causes exhaustion, irritability, reduced communication and quality

problems and errors—all of which cause problems within the working environment. Individuals handle stress differently; however, EI may help direct each individual through his or her response to stress.

The paper is organized as follows: we provide a literature review; describe data and methodology; report results; and provide concluding comments.

LITERATURE REVIEW

Emotional Intelligence

There have been several incrementally different definitions of emotional intelligence (EI) (Bar-On, 1997, Goleman, 1995, Shapiro, 1997, Weisinger, 1998), and the popular definition provided in Goleman's book, Emotional Intelligence (1995). However, Salovey and Mayer's (1990) original definition, the ability to deal with one's own emotions and those of others to advantage in problem solving and decision making, has endured and has served as the foundation for much of the research in this area. This definition, though modified and extended to include general emotional effectiveness through the centrality of reasoning regarding emotional processes (Mayer and Salovey, 1997), serves as the theoretical foundation for the assessment instrument utilized in our study (Wong and Law, 2002). Wong and Law's (2002) Wong Law Emotional Intelligence Scale (WLEIS) instrument assesses four dimensions of EI: self-emotional appraisal (SEA); others' emotional appraisal (OEA); and regulation of emotion (ROE); and use of emotions (UOE). Salovey and Mayer (1990) described EI as composed of four separate dimensions:

SEA relates to an individual's ability to understand his or her deep emotions and the ability to express these emotions naturally. People with high ability in this area will sense and acknowledge their emotions well before most people. SEA includes items like "I have a good sense of why I have certain feelings most of the time" and "I have a good understanding of my own emotions."

OEA captures the ability to perceive and understand the emotions of other people. People who are high in this ability are much more sensitive to the feelings and emotions of others—resulting in almost reading their minds. OEA includes items like "I always know my friends' emotions from their behavior" and "I am a good observer of others' emotions."

ROE addresses the ability to regulate one's own emotions, and higher levels of ROE enable a more rapid recovery from psychological distress. ROE includes items like "I am able to control my temper and handle difficulties rationally" and "I am quite capable of controlling my own emotions."

UOE captures the ability of individuals to make use of their emotions by directing them towards constructive activities and personal performance. UOE includes items like "I always tell myself that I am a competent person" and "I am a self-motivated person."

We used Gross' model of emotion regulation (1998a, 1998b) as a foundation for understanding the effect of EI on organizational outcomes. Gross defines emotions as "adaptive behavioral and physiological response tendencies that are called forth directly by evolutionarily significant situations" (1998b, p. 272). Gross (1998b) defines emotions as response tendencies that can be modulated—thus, can be regulated and managed. Emotion regulation refers to "the processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (1998b, p. 275). Gross' definition of emotion regulation fits with Mayer and Salovey's (1990) definition of EI. Before people can effectively regulate their emotions, they need to have a good understanding of their emotions (SEA). Since many of our emotional responses are influenced by the emotions of others, understanding our own emotions is directly influenced by our ability to understand others' emotions (OEA). Gross' emotion regulation model suggests that we have the ability to modulate how we experience emotions (ROE), as well as how we

express them (UOE). Combining the concepts of EI and emotional regulation, persons with high EI should be more able to modulate their response tendencies and have more effective emotion regulation processes. As a result, Gross' model of emotional regulation appears to be a reasonable theoretical basis for our investigation of the effects of EI on stress. Empirical support for the effectiveness of EI in predicting organizational outcomes is relatively modest. However, an increasing number of studies seeking to both define and examine the concept are appearing in the academic literature. Bar-On (2000), one of the earliest researchers on the contemporary concept of EI, found that the use of the Emotional Quotient I (EQ-I) (his EI instrument) in the selection of Air Force recruiters saved millions of dollars in annual costs in the recruitment process. In a study of debt collectors in a large collection agency, those with high scores on the EI competencies of self-actualization, independence and optimism had an average goal attainment of 163% over a three-month period as compared to an 80% goal attainment rate over the same period for those with significantly lower scores on the same dimensions (Bachman, Stein, Campbell and Sitarenios, 2000). Cherniss (1999) reported that experienced partners in a multinational consulting firm, who scored higher on EI competencies than did their partners, delivered $1.2 million more in profits from their activities. In a review of executive performance from over 30 international business organizations, McClelland (1998) concluded that a wide range of EI competencies (and a narrow range of cognitive ones) distinguished top performers from average ones. In an extensive study of similarly situated insurance companies, Williams (1994) concluded that those companies whose CEOs exhibited more

EI competencies had better financial results. The ability to generalize the findings from these early studies of EI is at least somewhat limited by a lack of agreement regarding how EI is defined in the different studies. Although the case for the unique impact of EI on desired organizational outcomes seems to be supportable, the lack of agreement on definitions makes comparisons and conclusions across studies problematic. Given the recent research directed toward a greater understanding of the concept, it is likely that the definition problem will be resolved over time. There does seem to be a growing consensus that EI is more of a core attribute upon which emotional competency and performance is built, rather than a unique predictor of organizational outcomes (Goleman, 1998, Mayer, Salovey and Caruso, 2000).

As a logical extension of knowledge regarding EI, our study sought to determine the unique impact of EI on stress in undergraduate college students. We examined whether older and more experienced undergraduate students had higher levels of EI. Some research that suggests that students' levels of EI increases as they progress in their studies. Boyatzis and Saatcioglu (2008) found that emotional, social and cognitive intelligences can be developed in Masters of Business Administration (MBA) students when specific interventions are given to the students. Higher levels of EI could be due to simple maturation on the part of the students or from development directly attributable to their college experience. This leads to the following hypothesis:

Hypothesis 1: College students who are older will show higher levels of EI.

<u>Sex and Emotional Intelligence</u>

Recent studies have suggested that women have higher levels of EI than men (Brackett, Mayer and Warner, 2004) and have the same levels of EI as each other (Bryant and Brown, 2004, Panda, 2008). If women process their emotions more effectively, and as a result have higher levels of EI, then we would expect them to be more effective at managing stress, and therefore, have lower levels of stress than men. This leads to the following hypothesis:

Hypothesis 2: Female college students will have higher levels of EI.

Emotional Intelligence and Stress

There have been many recent studies devoted to the relationship between EI and stress (e.g., Houghton, Jinpei, Godwin, Neck and Manz, 2012; Singh and Jha, 2012; Singh, 2009). Stress is an adaptive response that is moderated by individual differences that are the natural consequence of any action, situation or event that places special demands on a person (Ivancevich and Matteson, 1996). Houghton, Jinpei, Godwin, Neck and Manz examined college students and found that EI and self-leadership, as mediated through positive affect and self-efficacy, has the potential to facilitate stress coping among students. Riaz and Khan (2012) studied college professors and found a significant negative relationship between EI and stress. Singh and Jha found a strong significant negative correlation between EI and occupational stress. They did not find any sex effect on EI or stress. Ismail, Yeo, Ajis and Dollah (2009) further examined the relationship between EI, stress and performance. They found that EI mediated the relationship between stress and performance such that employees with higher levels of EI were better able to manage their stress and still have higher performance. Matthews, Emo, Funke, Zeidner, Roberts, Costa and Schulze (2006) found that even controlling for the personality factors of the Five Factor Model (FFM), EI was negatively correlated with stress. Finally, Panda (2008) found a significant negative relationship between EI and stress.

Recent studies have also assessed whether EI can predict college student outcomes such as retention, graduation and academic performance. Sparkman (2009) found in a study conducted over a five year period that students with higher levels of EI—particularly empathy, social responsibility, flexibility and impulse control—significantly correlated with enrollment and graduation rates. The study also found that social responsibility was the strongest positive predictor of graduation, followed by impulse control and empathy. Goldman, Kraemer and Salovey (1996) used the Trait Meta-Mood Scale to examine whether students' beliefs about their abilities to regulate feelings impacted stress and physical symptoms. They found that as stress levels increased, students with lower abilities to regulate their feelings were more likely to visit the student health center, which they concluded indicates the value of higher levels of EI to manage stress and physical health. The theory and the empirical findings suggest that being able to manage one's own emotions better will lead to lower levels of stress. Thus, people with higher levels of EI are expected to have lower levels of stress. This leads to the following hypothesis:

Hypothesis 3: College students with higher levels of EI will experience lower levels of stress.

Based on previous research, we expect that female students will have higher levels of EI than men. We also expect that students with higher levels of EI will experience lower levels of stress. Thus we would expect that female students would experience lower levels of stress than male students. This leads to the following hypothesis:

Hypothesis 4: Female college students will have lower levels of stress than male college students.

DATA AND METHODOLOGY

The data were collected in 2012. We e-mailed a link to an online survey to business professors in a College of Business in the Rocky Mountain region. Fifteen professors sent the survey link to their 903 students and asked them to voluntarily participate in the study. A total of 124 students (13.7% response rate) completed the survey (68% female, mean age = 24.10). The students could take the survey from a location of their choice at a time of their convenience. Emotional Intelligence (EI). We used Wong and Law's (2002) WLEIS scale to assess four theoretically supported dimensions (Mayer and Salovey, 1997) of EI: self-emotional appraisal (SEA); others' emotional appraisal (OEA); use of emotions (UOE); and regulation of emotion (ROE). The WLEIS uses a 7-point Likert scale to measure the dimensions of EI.

The EI scale had a Cronbach's alpha = 0.86 and Mean = 2.88. The four subscales also had high Cronbach's alphas that ranged from 0.81 to 0.88. A factor analysis using varimax rotation yielded a four-factor model with the 16 items loading cleanly on the four factors as predicted by the scale. The means, Cronbach's alphas and correlations are presented in Table 1. Stress. We used House and Rizzo's (1972) job strain scale to measure stress. The seven item stress scale yielded a Cronbach's alpha of 0.87 and Mean = 3.50.

Control variables. Past studies on EI and stress have controlled for sex, age, workload and cognitive ability. Our model controlled for sex, age, and self-reported college Grade Point Average (GPA) as a proxy for intelligence.

Table 1: Correlations and Scale Reliability

	Mean	Cronbach	Age	Sex	GPA	SEA	OEA	ROE	UOE	ALL
Age	24.10									
Sex	1.68		-0.01							
GPA	3.34		0.13	0.10						
SEA	5.76	0.85	0.26**	-0.11	-0.06					
OEA	5.43	0.87	0.06	0.26**	0.02	0.22*				
ROE	5.79	0.81	0.14	0.05	0.16	0.36**	0.04			
UOE	5.26	0.88	0.17	-0.32**	-0.08	0.53**	0.14	0.32**		
ALL	5.57	0.86	0.23*	-0.06	0.02	0.77**	0.54**	0.63**	0.79**	
STRESS	3.50	0.87	-0.11	-0.33**	0.14	-0.08	0.09	-0.01	-0.31**	-0.12
N = 124										

*This table summarizes the correlations between all the variables (Age, Sex, GPA, SEA, OEA, ROE, UOE and EI-ALL) and the scale reliability (Cronbach Alpha) measures for each variable. ** Correlation is significant at the p < 0.01 level (2-tailed). * Correlation is significant at the p < 0.05 level (2-tailed).*

RESULTS

Hypothesis 1

Hypothesis 1 predicted that older students would exhibit higher levels of emotional intelligence (EI). We tested Hypothesis 1 using hierarchical regression (See Table 2). The following regression equation was estimated to identify determinants of overall emotional intelligence (EI-ALL):

$$\text{EI-ALL} = \alpha + \beta 1(AGE) + \beta 2(\text{Sex}) + \beta 3(\text{GPA}) \tag{1}$$

Model 1 regressed age, sex, and college Grade Point Average (GPA) on the overall EI scale (EI-ALL). The overall model explained a nearly significant amount of variance in overall EI ($R^2 = 0.06$, $F(3, 119) = 2.40$, $p < 0.10$). Age was a significant predictor of EI-ALL (EI-ALL) ($\beta = 0.23$, $p < 0.05$). We then regressed age, sex and college GPA on the four sub-scales of EI. This result supports Hypothesis 1 that age is a significant predictor of EI, such that older students have higher levels of EI. Model 2 reports the results of regressing age, sex and college GPA on EI self-emotion appraisal (EI-SEA) with the overall model significantly predicting EI-SEA ($R^2 = 0.07$, $F(3, 119) = 3.05$, $p < 0.05$). The following regression equation was estimated to identify determinants of self-emotional appraisal (EI-SEA):

$$\text{EI-SEA} = \alpha + \beta 1(AGE) + \beta 2(\text{Sex}) + \beta 3(\text{GPA}) \tag{2}$$

Age was a significant predictor of EI-SEA ($\beta = 0.27$, $p < 0.01$). Age was not a significant predictor of EI for the other EI subscales. This result also supports Hypothesis 1 that age is a significant predictor of EI, such that older students have higher levels of EI-SEA.

Table 2: Multiple Regression Results for Predicting Emotional Intelligence[a]

Dependent Variable	Model 1 EI-ALL (β)	Model 2 EI-SEA (β)	Model 3 EI-OEA (β)	Model 4 EI-UOE (β)
Controls				
Age	0.23*	0.27**	0.07	0.18
Sex	-0.06	-0.10	0.26**	-0.31***
College GPA	-0.01	-0.09	-0.01	-0.07
Model Summary	$R^2 = 0.06$ F = 2.40† df = 3, 119	$R^2 = 0.07$ F = 3.05* df = 3, 119	$R^2 = 0.07$ F = 3.05* df = 3, 120	$R^2 = 0.13$ F = 6.18*** df = 3, 120

This table shows the regression estimates for the following 4 models, which regress Age, Sex and GPA on emotional intelligence: Model 1 EI-ALL = α + β1(AGE) + β2(Sex) + β3(GPA). The overall regression model predicted a nearly significant amount of variance. Age was a significant predictor of overall EI. Model 2 EI-SEA = α + β1(AGE) + β2(Sex) + β3(GPA). The overall model and age predict a significant amount of variance in EI-SEA. Model 3 EI-OEA = α + β1(AGE) + β2(Sex) + β3(GPA). The overall model and sex predict a significant amount of variance in EI-OEA. Model 4 EI-UOE = α + β1(AGE) + β2(Sex) + β3(GPA). The overall model and sex predict a significant amount of variance in EI-UOE.
[a] Standardized regression coefficients are reported. N = 124, † p < 0.10, p < 0.05, ** p < 0.01, ***p < 0.001*

Hypothesis 2

Hypothesis 2 predicted that female college students would have higher levels of EI than male college students. To test this hypothesis we regressed age, sex and college GPA on the overall EI scale and the four EI sub-scales (See Table 2). Model 1 regressed age, sex and college GPA on the overall EI scale (EI-ALL). The following regression equation was estimated to identify determinants of overall emotional intelligence (EI-ALL):

$$EI\text{-}ALL = \alpha + \beta1(AGE) + \beta2(Sex) + \beta3(GPA) \tag{3}$$

The overall model explained a nearly significant amount of variance in overall emotional intelligence (EI-ALL) ($R^2 = 0.06$, $F(3, 119) = 2.40$, $p < 0.10$). Sex was not a significant predictor of EI-ALL ($\beta = -0.06$, $p > 0.10$).

We then examined the impact of age, sex and college GPA on the four sub-scales of EI. Sex did not predict a significant amount of variance in EI-Self-Emotional Appraisal (EI-SEA) or EI Regulation of Emotion (EI-ROE). However, sex did predict a significant amount of variance in EI-Others' Emotion Appraisal (EI-OEA) (See Table 2). Model 3 regressed age, sex and college GPA on EI-OEA, and the overall model predicted a significant amount of variance in EI-OEA ($R^2 = 0.07$, $F(3, 120) = 3.05$, $p < 0.05$). The following regression equation was estimated to identify determinants of others' emotional appraisal (EI-OEA):

$$EI\text{-}OEA = \alpha + \beta1(AGE) + \beta2(Sex) + \beta3(GPA) \tag{4}$$

Sex was a significant predictor of EI-OEA ($\beta = 0.26$, $p > 0.01$). The means indicate that males ($M = 5.60$) were significantly higher than females ($M = 5.43$). This result supports a significant difference between males and females, however it is in the opposite direction from what we hypothesized. Model 4 regressed age, sex and college GPA on EI Use of Emotions (EI-UOE) and the overall model predicted a significant amount of variance in EI-UOE ($R^2 = 0.13$, $F(3, 120) = 6.18$, $p < 0.001$). The following regression equation was estimated to identify determinants of use of emotions (EI-UOE):

$$EI\text{-}UOE = \alpha + \beta1(AGE) + \beta2(Sex) + \beta3(GPA) \tag{5}$$

Sex was a significant predictor of EI-UOE ($\beta = -0.31$, $p < 0.001$). The means indicate that females ($M = 5.25$) were significantly higher than males ($M = 4.99$), consistent with our hypothesis. These results provide partial support for Hypothesis 2. While sex did not predict overall EI-ALL, it did predict significant amounts

of variance in two of the EI sub-scales: EI-OEA and EI-UOE, although only EU-UOE was consistent with our hypothesis.

Hypothesis 3

Hypothesis 3 predicted that college students with higher levels of EI would experience lower levels of stress. To test this hypothesis we used hierarchical regression (See Table 3). Model 1 regressed age, sex and college GPA on stress. The overall regression model predicted a significant amount of variance in stress (R^2 = 0.13, F (3, 119) = 5.95, p < .001). The following regression equation was estimated to identify determinants of stress:

$$Stress = \alpha + \beta1(AGE) + \beta2(Sex) + \beta3(GPA) \tag{6}$$

Model 2 added the four EI sub-scales into the regression model. The following regression equation was estimated to identify determinants of stress:

$$Stress = \alpha + \beta1(AGE) + \beta2(Sex) + \beta3(GPA) + \beta4(EI\text{-}SEA) + \beta5(EI\text{-}OEA) + \beta6(EI\text{-}ROE) + \beta7(EI\text{-}UOE) \tag{7}$$

The overall regression model had a moderately significant increase in the predictive strength of the model (ΔR^2 = 0.07, ΔF (4, 115) = 2.33, p = 0.06). Model 2 predicted a significant amount of variance in stress (R^2 = 0.20, F (4, 115) = 4.00, p < 0.001). The only EI subscale that was significant was EI UOE (β = -0.33, p < 0.01). This provides partial support for Hypothesis 3 that students with higher levels of EI will have lower levels of stress.

Hypothesis 4

Hypothesis 4 predicted that female students would have lower levels of stress than male students. To test this hypothesis, we used hierarchical regression (See Table 3). Model 1 regressed age, sex and college GPA on stress. The following regression equation was estimated to identify determinants of stress:

$$Stress = \alpha + \beta1(AGE) + \beta2(Sex) + \beta3(GPA).$$

The regression model predicted a significant amount of variance in stress (R^2 = 0.13, F (3, 119) = 5.95, p < 0.001). Sex was a significant predictor of stress (β= 0.32, p < 0.001), such that females (M = 3.49) had significantly lower levels of stress than males (M = 3.69). This provides support for Hypothesis 4.

Table 3: Regression Results for Predicting Stress [A]

	Model 1 (β)		Model 2 (β)	
Controls				
Age	-0.12		-0.11	
Sex	0.32***		0.21*	
College GPA	0.11		0.07	
EI-SEA			0.09	
EI-OEA			0.03	
EI-ROE			0.14	
EI-UOE			-0.33**	
	R^2 =	0.13	R^2 =	0.20
	F =	5.95***	F =	4.00***
Model Summary	df =	3, 119	df =	4,115
	ΔR^2 =	0.13*	ΔR^2 =	0.07†

This table shows the regression estimates for the following 2 models, which regress Age, Sex, GPA and EI on stress: Model 1 Stress = α + β1(AGE) + β2(Sex) + β3(GPA). The regression model predicted a significant amount of variance. Sex was a significant predictor of stress, such that women had lower levels of stress than men. Model 2 Stress = α + β1(AGE) + β2(Sex) + β3(GPA) + β4(EI-SEA) + β5(EI-OEA) + β6(EI-ROE) + β7(EI-UOE). The regression model predicted a significant amount of variance. Sex and EI-UOE were significant predictors of stress, such that women had lower levels of stress than men. [a] Standardized regression coefficients are reported. N = 124, † p < 0.10, p < 0.05, **p < 0.01, ***p < 0.001*

CONCLUDING COMMENTS

The results indicate that the emotional intelligence (EI) levels of college students are impacted by age and sex. The results also suggest that students with higher levels of EI experience lower levels of stress. These finding provide some interesting implications for theory and future research.

Implications for Theory and Future Research

Hypothesis 1, which predicted that older students would exhibit higher levels of EI, was supported. While we did examine year in school, there was no significant relationship between year in school and EI or stress. Only age was a significant predictor. This has a couple of interesting implications. It suggests that students gain EI simply by increasing their life experiences. Although some studies suggest that EI can be developed in the classroom setting (e.g., Boyatzis and Saatcioglu, 2008), our study suggests that students may increase their levels of EI simply by growing older and having more experiences.

Hypothesis 2, which predicted that female college students would have higher levels of EI than male students, was partially supported. While sex did not predict the overall EI scale (EI-ALL), it did predict significant amounts of variance in two of the EI sub-scales: EI-Others' Emotion Appraisal (EI-OEA) and EI-Use of Emotions (EI-UOE), although only EI-UOE was consistent with our hypothesis.

Hypothesis 3, which predicted that college students with higher levels of EI would experience lower levels of stress, was partially supported. In particular, we found that one EI subscale, UOE significantly predicted stress. This is consistent with past research on the EI of students.

Hypothesis 4, which predicted that female students would have lower levels of stress than male students, was supported. This is consistent with past research on EI and stress.

This study has several implications for emotional intelligence (EI) theory. It supports previous research that suggests that higher levels of EI are related to lower levels of stress. It also supports previous research that found that female students have higher levels of EI than male students. Thus, female students have lower levels of stress. It extends the research on undergraduate students by examining the relationship between stress and EI. It suggests that helping students develop their levels of EI might decrease their stress levels and thus improve their performance and likelihood of graduating.

Future research needs to address whether EI and stress levels change over time. Ideally, we would look at cohorts of students and assess their levels at the beginning of college and at the end of college to see what changes they made. It would be interesting to see if the relationships between sex and EI and stress hold up when assessing the development of the same students. Future researchers will also need to examine whether providing training on EI results in higher levels of EI and lower levels of stress.

This study used validated and reliable measure of EI and stress; however, they were self-reported measures by the participants. This raises the possibility that the results are caused by common method variance. However, since the results are consistent with other research on EI, stress and sex, we believe the results are solid. Our study extends the research on EI and stress in undergraduate students. The finding that higher levels of EI relate to lower levels of stress suggests that we should be helping students develop their EI. The fact that there appear to be differences between male and female students in levels of both EI and stress suggests that male students may need training and development even more than female students. Helping students develop their EI holds promise to help them more effectively manage stress which should result in higher academic performance and perhaps even graduation rates.

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THE EFFECT OF PERSONALITY ON ACADEMIC PERFORMANCE: EVIDENCE FROM TWO UNIVERSITY MAJORS

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ABSTRACT

Our study focuses on the effect of personality type and personality preferences measured by the Myers–Briggs typology, on higher education students' choice of profession and on their academic performance. We statistically analyzed a sample from two slightly similar bachelor majors studied at the University of Debrecen, Hungary, to reveal both the general and major-specific effects of personality. We have found that the most frequent types in both majors were ENFJ and ESFJ; however, differences were revealed in the relative frequencies in the ESTJ, ISTJ and ENFJ types. We identified significant differences between the majors in the average preferences along the introversion-extraversion scale and in the sensing-intuition dichotomies (the latter was significant only for female students). We also found differences in the explanatory power of personality for the two majors and also in the types and preferences which contribute positively or negatively to academic success.

JEL: A22, A23, I21

KEYWORDS: Business Education, Higher Education, Career, Personality Type, MBTI

INTRODUCTION

The social sciences have long been interested in the relationship between personality and career. However, we can examine the effect of personality on the success of an individual in at least 5 phases of his/her career: (1) performance in public education, (2) choice of profession, (3) performance in vocational, professional or higher education, (4) choice of job, and (5) success in the given job, e.g. work performance, income, advancement, and job satisfaction. The earlier phases are likely to have a significant effect on the later ones as they ground the later phases. Empirical studies confirm that personality contributes to personal achievement to at least some degree in public education (e.g. Neuenschwander et al., 2013, Laidra et al., 2007), to decisions about the choice of academic major and profession (e.g. Borges and Gibson, 2005, Cano and Garton, 1994, Hartung et al., 2005, Dunning, 2001, Hinton and Stockburger, 1991, Sears et al., 1997, Ditiberio and Hammer, 1993, Borges and Savickas, 2002), to performance in vocational, professional and higher education (e.g. Borg and Shapiro, 1996, Borg and Stranahan, 2002a, Borg and Stranahan, 2002b, Ziegert, 2000, Ditiberio and Hammer, 1993), to the choice of job (e.g. Lawrence, 1986, Keirsey and Bates, 1984, p. 155-166, Kennedy 2002), and to success in the labor market, whether this is in terms of job performance (e.g. Barrick et al., 2001, Judge and Bono, 2001), wages and advancement (e.g. Andrisani, 1977, 1981, Cobb-Clark and Tan, 2009), or job satisfaction (e.g. Ayan and Kocacik, 2010, Judge et al., 2000, Judge and Bono, 2001, Judge et al., 2005).

Our study contributes to a better understanding of the relationship between personality and career by

answering three research questions. First, it compares the two academic majors in our sample (BA in 'Business Administration and Management' (BAM) and BSc in 'Business Informatics' (BI)) by the personality types of their students, and examines whether there are any significant differences between them, i.e. it searches for results for the second phase. It builds the examination on the Myers–Briggs personality typology (Briggs-Myers et al., 1998). The second research question explores the effect of personality type as an independent variable on academic success in the two selected majors. The third research question focuses on the same role of the four personality preferences underlying the Myers–Briggs typology. In the case of the first research question we have the opportunity to compare our findings to previous research results found in the literature. However, we do not have any information about any examinations similar to our second and third analyses.

The second section of the study briefly introduces the personality typology used in the research and the results of various studies from the literature dealing with similar research questions. The data collection method and the introduction of the sample are included in the third section. The fourth demonstrates the statistical analysis and the results. In the fifth section the conclusions drawn from the empirical findings are presented.

LITERATURE REVIEW

Here we will introduce the Myers–Briggs personality typology used in the research only to the extent necessary for an understanding of the research results. Detailed descriptions are available in several textbooks and studies (e.g. Quenk, 2009, Briggs-Myers et al., 1998, Keirsey and Bates, 1984, Bayne, 1997). The typology of the 16 personality types used in our examination was created by K. C. Briggs and I. Briggs-Myers based on, and complementing, the personality theory of C. G. Jung (Quenk, 2009, p. 1-3). The 16 personality types are defined along 4 preference pairs (called dichotomies): (E) extraversion and (I) introversion, (S) sensing and (N) intuition, (T) thinking and (F) feeling, (J) judging and (P) perceiving. The names of the personality types are traditionally formed by the letter combinations of the preferred 'poles' of each pairs, in the above order (i.e. ESTJ, ISTJ etc.).

The concept of personality preference has no formal definition but can be described as 'feeling most natural and comfortable with' (Bayne, 1997, p. 4). According to Bayne, preferences have a strong influence on, but are not identical to, behavior, because behavior is usually affected by many other factors simultaneously. All the eight preference-poles are used at least some of the time by all individuals, although the preferred ones tend to be used more frequently. The official instrument used to measure the preferences – and hence types – was also developed; this is the Myers–Briggs Type Indicator® (MBTI®) (Quenk, 2009, p. 1-3). However, many other assessment instruments exist that are capable of categorizing people into the 16 Myers–Briggs personality types (e.g. Hogan and Champagne, 1980, Keirsey, 1998); sometimes not only the instrument but also the underlying theory is misleadingly referred to as MBTI.

The first dichotomy, termed 'the opposite attitudes of energy' (Quenk, 2009, p. 8), is extraversion versus introversion. In Jungian terminology extraversion means outward-turning, while introversion means inward-turning. The extraverted attitude directs psychic energy to, and receives energy from, the outer world of people, things, and action. People with an extraverted preference like actively engaging others, acquiring experiences through a trial-and-error approach and they think more effectively when interacting with others. The introversion attitude is the opposite. It directs psychic energy to the inner world of ideas and reflection, and it acquires energy from operating there. Introverted people tend to think internally and they can work alone effectively.

The second dichotomy is 'the opposite functions of perception': sensing and intuition (Quenk, 2009, p. 6). A person who prefers 'sensing perception' focuses on concrete reality, gathering facts and details of the present by using the five senses. A sensing person tends to be less interested in hypotheses and future

possibilities. Intuition deals with the patterns, concepts, ideas, theories, and connections among diverse pieces of information. It is harder for an intuitive person to remember and use facts and data without a meaningful context.

The third pair of opposite categories is 'the opposite functions of judgment': thinking and feeling (Quenk, 2009, p. 6-7). 'Thinkers' apply specific criteria and principles in a linear, logical and impersonal analysis of information to get as close to the objective truth as it is possible. Feeling-based judgment tends to apply personally held values to assess the relative importance of the information at hand. When a person who prefers feeling makes a decision, his or her primary concern is the consequences of the decision as they affect individuals or groups.

The last dichotomy is 'the opposite attitudes toward the outside world': judging and perceiving (Quenk, 2009, p. 8-9). Those who prefer a judging attitude are organized, structured, work effectively within schedules, and wish to reach a conclusion or make a decision quickly. 'Perceiving' decision makers like to collect as much information as possible before coming to a conclusion. They are flexible, adaptable, and spontaneous when working in the outside world.

It is possible to draw conclusions regarding someone's personality directly from their preferences (e.g. Hogan and Champagne, 1980), too, and not only from the types. Our study will do the same in the Results and Discussion chapter. Moreover, some authors have introduced alternative combinations of preferences at variance with the original sixteen types system, such as the four temperaments of Keirsey and Bates (1984).

Many previous studies have examined the relationship between higher education students' Myers–Briggs personality types and their performance in various fields of college or university studies. We will briefly summarize the findings of those closest to our research questions. Borg and Shapiro (1996) found that for students on Principles of Macroeconomics courses personality preferences measured by MBTI had a significant influence on academic success. Borg and Shapiro (1996) tested three models on 119 students who completed the above named course in 1990 at the University of North Florida (UNF). First, they measured the effect of the type, and found that ENTP, ESTP and ENFP students did significantly worse than the ISTJs (which was the most frequently occurring personality among the students). The independent effect of the four MBTI preferences on grades was also examined, demonstrating that being an introvert had a significant positive effect on the chance of getting a good grade. On the same sample Borg and Stranahan (2002a) later provided support for the hypothesis that race and gender combined with personality temperament form more subtle, interactive effects on a student's performance in Principles of Macroeconomics.

Ziegert (2000) replicated Borg and Saphiro's work cited above with a larger sample (617 students) from Miami University. The course examined was Microeconomics Principles. She also extended the examination, introducing the pre-course and post-course TUCE (Test of Understanding College Economics) scores as an alternative proxy for learning performance, with 400 and 300 students. The TUCE is considered to be a more precise and consistent measure of student performance than course grades, because it avoids instructor-specific evaluation differences. The author finds that the ENTP, ESFJ, INFP and ENTJ personality types perform significantly worse in terms of grades than the ISTJ type. With the post-TUCE score as a dependent variable, the analysis showed the ISTJ type students achieved significantly higher performances than ESFP, ENFP, INFJ, ENFJ, ESFJ, INFP, ISFJ and ESTJ students, while INTJ students significantly outperformed them. Ziegert also calculated the post-TUCE minus pre-TUCE scores, to measure the knowledge increase during the course. With the latter as a dependent variable, ESFP, ENFP, ENFJ, INTJ, ESFJ, INFP, ISFJ and ESTJ students differed significantly from the ISTJ students. INTJs performed better than them, the others were worse. Ziegert also examined the effect of the four personality preference scales and found that the sensing and the thinking preferences

contributed positively to grades, while for the post-TUCE score only the judging preference was insignificant, and while the sensing preference modified the post-TUCE performance negatively. Only the thinking dimension had significant, positive effects on the knowledge increase during the semester (post-TUCE minus pre-TUCE).

Borg and Stranahan (2002b) continued Borg, Shapiro and Ziegert's line of research and investigated the personality effects on a sample of 166 UNF students from three advanced-level economics courses. They found only the effect of the introversion type significant (in their model the four dichotomies were represented by dummy variables); this had a positive effect. They did not measure the effect of the 16 types.

The above cited studies focused on the connection between personality and academic success in one course (Borg and Shapiro, 1996, Ziegert, 2000), or in only a small number of similar courses (Borg and Stranahan, 2002b). However, the students' most important decisions are made when they choose a profession, a major, a specialization or an educational institution, and in doing this, a given combination of heterogeneous courses, and not when they choose an individual course. For this reason the authors of the current study aimed to use a modified version of the above cited research on two majors which are different but overlap to some extent, thereby emphasizing the role of measurable personality elements in making a better career choice at the higher education level.

DATA AND METHODOLOGY

Our data on personality and academic achievement was based on our primary questionnaire survey at the Faculty of Economics and Business Administration at the University of Debrecen, Hungary. The survey was implemented in October and November 2011, in classes where attendance was obligatory. BA in Business Administration and Management (BAM) and BSc in Business Informatics (BI) students in their second and third year made up our sample. The total number of the sample was 354, with 102 second and 122 third year BAM students (224 in total) and 79 second and 51 third year BI students (130 in total). The Business Administration and Management major is run by the Faculty of Economics and Business Administration (FEBA) and focuses mostly on management, and partly on economics studies, whilst the other major combines informatics with management courses, and is part of the Faculty of Informatics (FI), and the FEBA only teaches these students management studies. Thus, accepting that different personalities fit different professions, it seems reasonable to expect differences in personality types and preference distributions between students on the two majors; moreover we can expect to find that types and preferences are connected in different ways to their academic success.

To measure the personality preferences we used a questionnaire containing 72 forced choice questions. We also asked the respondents to give their sex and year of birth, whether they had worked before, whether they are studying on more than one major simultaneously, whether their permanent abode was in the same city as the university, and if not, how much time they spent travelling between their home and the university (in minutes). Table 1 includes the explanation of the independent and dependent variables we used in the study, while Table 2 summarizes the frequency, mean and standard deviation data of the independent and dependent variables grouped by majors and university years.

Table 1: Explanation of Variables

Variable Name	Explanation
SEX	1 if the student is female, 0 if male.
AGE	Age of the student in years. This was calculated as the difference between the date the questionnaire was filled in and the year of birth (the assumed birthday was 1st July).
LOCAL	1 if the student is a local resident, 0 otherwise.
DISTANCE	Traveling time between the student's home and the university in minutes.
PLUSMAJOR	1 if the student has more than one major, 0 if not.
WORK	1 if the student has any work experience (past or present), 0 if not.
MBTI TYPE	Dummy variables indicating the 16 Myers–Briggs personality types. 1 if the student belongs to the given type, 0 otherwise.
MBTI PREFERENCE	Strength of a student's preference in each of the 4 Myers–Briggs dichotomies, measured in percentages. If a preference is p, the opposite preference of the dichotomy is $(100 – p)$.
INDEX	Average of a special form of grade index officially termed 'stipend index' of the previous two academic semesters (1.00 is the minimum, 5.00 is the maximum). The stipend index is calculated as the product of the credit values of subjects graded as 'pass' or higher multiplied by their grades divided by the total number of credits undertaken.
STDINDEX	INDEX standardized by majors and university years.

This table includes the explanation of the independent and dependent variables we used in the study.

Table 2: Frequencies, Means and Standard Deviations of Variables by Majors and University Years

Variables	Business Administration and Management						Business Informatics						Total		
	2nd Year			3rd Year			2nd Year			3rd Year					
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
SEX	102	0.6765	0.4701	122	0.5574	0.4987	79	0.2025	0.4045	51	0.2549	0.4401	358	0.4689	0.4997
YEAR OF BIRTH	101	1,990.8	0.7755	119	1,989.7	0.8473	79	1,990.4	1.278	51	1,989.0	1.076	354	1,990.1	1.159
AGE	101	20.417	2.183	119	21.212	3.484	79	21.053	1.372	51	22.407	1.076	350	21.123	2.593
LOCAL	99	0.2828	0.4527	120	0.3750	0.4862	78	0.2436	0.4320	48	0.2917	0.4593	348	0.3072	0.4620
DISTANCE	98	69.327	83.939	120	54.517	68.160	77	67.883	73.200	48	59.854	66.464	346	62.496	73.864
PLUSMAJOR	102	0.0392	0.1951	122	0.0410	0.1991	79	0.0000	0.0000	51	0.0196	0.1400	358	0.0282	0.1659
WORK	96	0.4583	0.5009	122	0.6066	0.4905	77	0.6753	0.4713	51	0.5294	0.5041	358	0.5694	0.4959
INDEX	102	3.137	0.5953	122	3.124	0.6521	79	2.722	0.7269	51	2.860	0.6976	358	3.000	0.6810

This table summarizes the frequency, mean and standard deviation (Std. Dev.) data of the independent and dependent variables grouped by majors and university years.

RESULTS AND DISCUSSION

To examine the personality type differences by majors, we analyzed the distribution of the 16 personality types on the two selected majors, first independently and then on the combined sample. The university year of students was not taken into consideration at this stage, because the distribution of personality types did not depend on the courses studied in a given year but on the selection of profession students had made by choosing a particular major. We presented the findings in Table 3. Types appear in the table in the descending order of their frequency in the combined sample. Ranks were also calculated from the relative frequency (ratio) of the type within the different samples. We used rank means, if this ratio was the same for more than one type.

One can observe various differences between the majors. Many personality types are ranked differently on the two majors. The greatest differences can be found in the following cases (the absolute value of the difference between ranks on the two majors are in parentheses): the Business Administration and Management (BAM) major has higher ranks for types INTJ (2.5), ESTJ (2), ENTP (2), and lower for ISTJ (4) and INFJ (3) than the Business Informatics (BI) major. The relative frequencies of ISTJ (0.0800), ISFJ (0.0400), INFJ (0.0300), ENFP (0.0200) and ISTP (0.0100) types were greater in the BAM major, and the ESTJ (0.1000), ENFJ (0.0600), ESFJ (0.0100) and ENTP (0.0100) types in the BI major (the absolute values of the difference between relative frequencies are in parentheses). In Table 3 italic

fonts show those types that have a frequency great enough to use statistical measures on them to compare the two majors by the distribution of personality types. Tables 4, 5 and 6 present the measures computed.

Table 3: Distribution of Personality Types in Majors (Frequencies, Ratios, Ranking Orders)

Type	Business Administration and Management			Business Informatics			Total		
	Frequency	Ratio	Rank	Frequency	Ratio	Rank	Frequency	Ratio	Rank
ESFJ	46	0.2100	1	30	0.2200	1	76	0.2100	1
ENFJ	32	0.1400	2	27	0.2000	2	59	0.1600	2
ESTJ	21	0.0900	5	26	0.1900	3	47	0.1300	3
ENTJ	22	0.1000	4	13	0.1000	4	35	0.1000	4
ISTJ	27	0.1200	3	6	0.0400	7	33	0.0900	5
ISFJ	20	0.0900	6	7	0.0500	5.5	27	0.0800	6
INTJ	12	0.0500	8	7	0.0500	5.5	19	0.0500	7
ENFP	12	0.0500	8	4	0.0300	9	16	0.0400	8
INFJ	12	0.0500	8	3	0.0200	11	15	0.0400	9
ESFP	7	0.0300	10	4	0.0300	9	11	0.0300	10
ENTP	5	0.0200	11	4	0.0300	9	9	0.0300	11
ESTP	3	0.0100	12	2	0.0100	12	5	0.0100	12
INTP	2	0.0100	13.5	1	0.0100	13	3	0.0100	13
ISTP	2	0.0100	13.5	0	0.0000	15	2	0.0100	14
INFP	1	0.0000	15	0	0.0000	15	1	0.0000	15
ISFP	0	0.0000	16	0	0.0000	15	0	0.0000	16
Total	224	1.000		134	1.000		358	1.000	

This table presents the frequencies, relative frequencies (named Ratio) and ranking of personality types in the two majors and in the combined sample (Total). Italic fonts show those types that have a frequency great enough to use statistical measures on them to compare the two majors by the distribution of personality types.

The measures in Tables 4, 5 and 6 calculated for the group of ESFJ, ENFJ, ESTJ, ENTJ, ISTJ, ISFJ, INTJ, ENFP and INFJ type students in BAM and BI majors support the idea that students on the 2nd and 3rd year of BAM tend to be different in their personality types from their BI counterparts. This difference is significant by most measures (the only exception was the lambda) at the 0.05 level. However, the association is weak (the value of symmetric measures are between 0.23 and 0.24).

Table 4: Chi Square Tests

Measure	Value	DF	Asym. Sig. (2-Sided)
Pearson Chi-Square	18.018	8	0.0211
Likelihood Ratio	18.698	8	0.0166
N of Valid Cases	327		

This table presents the values, degrees of freedom, and asymptotic significance levels for the Person Chi square test and the Likelihood ratio. 0 cells have expected count less than 5. The minimum expected count is 5.642.

Table 5: Symmetric Measures

Measure	Value	Approx. Sig.
Phi	0.2347	0.0211
Cramer's *V*	0.2347	0.0211
Contingency Coefficient	0.2285	0.0211
N of Valid Cases	327	

This table presents the values and approximate significance levels for the Phi, Cramer's V and Contingency coefficient measures.

We also tested whether the average preferences differ significantly for the two majors. Table 7 includes the preference means and standard deviations by major and sex. With an independent samples *t*-test we analyzed the existence of significant differences between females and males on the two majors by the 4 dichotomies. BAM male students were significantly more introverted ($t = 2.599$, df = 162.06) than their

BI counterparts at the 0.05 level, and they were also more intuitive on average ($t = 1.709$, df = 186.00), at a 0.10 level of significance. Female students were more intuitive on average if they were studying on the BI major ($t = -1.693$, df = 164.00). On the combined sample by sex, an average BAM student was significantly more introverted at the 0.05 level ($t = 2.532$, df = 306.47).

Table 6: Directional Measures

Measure	Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Lambda (symmetric)	0.0134	0.0182	0.7299	0.4654
Lambda (major is dependent)	0.0407	0.0546	0.7299	0.4654
Goodman and Kruskal tau (major is dependent)	0.0551	0.0238	–	0.0215[d]
Uncertainty Coefficient (symmetric)	0.0210	0.0094	2.238	0.0166[e]
Uncertainty Coefficient (major is dependent)	0.0432	0.0193	2.238	0.0166[e]
N of Valid Cases	327			

This table contains the values, asymptotic standard errors, approximate t statistics, and approximate significance levels for three directional measures. a. Not assuming the null hypothesis; b. Using the asymptotic standard error assuming the null hypothesis; c. Cannot be computed because the asymptotic standard error equals zero; d. Based on chi-square approximation; e. Likelihood ratio chi-square probability.

Table 7: Average Personality Preferences by Major and Sex (Means and Standard Deviations)

Preference	Business Administration and Management				Business Informatics			
	Males N = 87		Females N = 137		Males N = 101		Females N = 29	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Introversion	41.897	26.225	38.518	24.370	32.861	20.553	35.655	23.725
Intuition	53.230	14.759	47.168	16.860	49.703	13.531	52.931	15.588
Thinking	53.333	17.110	41.248	16.110	49.317	16.435	37.931	15.358
Perceiving	46.667	17.110	58.752	16.110	50.683	16.435	62.069	15.358

This table presents the means and standard deviations of four preference-poles, divided by major and sex.

Beside the examination of the personality type differences by majors, this part of the study also examines the contribution of the Myers–Briggs personality types to the students' academic achievement in both majors individually, and then compares the results. Our models took into consideration the effect of certain demographic and background factors, thus the 'starting' equation used in the linear regression analysis was the following:

$$STDINDEX = f (SEX, AGE, LOCAL, WORK, PLUSMAJOR, MBTI\ TYPE) \tag{1}$$

The DISTANCE variable was left out from the independent variables in all models, because it had similar content to the LOCAL variable, and LOCAL fitted the models better. The dependent variable was STDINDEX rather than INDEX, to focus on the academic success of a student compared to the average of his/her own year and major; this also enabled comparison between the majors examined. We have also used 'reduced' models, where only those independent variables were introduced that were significant at least at the 0.10 level. Table 8 reports the results of the linear regression analysis for the two starting, and the two reduced, models. The ESFJ dummy variable was omitted from the models, because this was the most frequent of all the 16 personality types.

In the starting model of the BAM major three personality types contributed significantly to the dependent variable at the 0.10 level. INFP, ENFJ and ISFJ type students tend to have lower stipend indices than those with the ESFJ type. Besides personality types, being female, being a local resident and having some work experience had a significant effect on the dependent variable at the 0.1 level: female students and locals outperformed the males and those living in another settlement, but those who were, or had been, employed were underperformers.

Table 8: Results of Linear Regression Models with Personality Types

Dependent Variable: Standardized Average of Stipend Indices (STDINDEX)								
Independent Variable	Business Administration and Management				Business Informatics			
	Starting Model N = 210		Reduced Model N =218		Starting Model N = 124		Reduced Model N = 130	
	Estimate	t	Estimate	t	Estimate	t	Estimate	t
CONSTANT	-0.1948	-0.1310	0.1142	0.8506	0.1867	0.1194	-0.1378	-1.269
SEX	0.4742***	2.867	0.4063***	2.934	0.3324	1.377	0.3636*	1.743
AGE	0.2667	1.818	–	–	-0.0174	-0.2416	–	–
LOCAL	-0.4118*	-2.839	–	–	0.2156	1.029	–	–
WORK	0.0098***	0.1377	-0.4100***	-3.097	0.2267	1.167	–	–
PLUSMAJOR	0.0939	0.2643	–	–	-0.8635	-0.8134	–	–
INTP	0.1363	0.1400	–	–	-0.3381	-0.3315	–	–
ENTP	0.0826	0.1746	–	–	0.0256	0.0477	–	–
INTJ	0.2490	0.7006	–	–	0.0898	0.2131		
ENTJ	-0.0397	-0.1514	–	–	-0.1918	-0.5327	–	–
INFP	-2.480**	-2.343	-2.204**	-2.304	–	–	–	–
ENFP	-0.4744	-1.322	–	–	-0.5096	-0.9401	–	–
INFJ	0.3057	0.9613	–	–	0.3810	0.6205	–	–
ENFJ	-0.4038*	-1.809	-0.3769**	-2.012	0.2648	0.9158	0.4300*	1.958
ESFP	-0.5615	-1.324	–	–	-1.088**	-2.013	-0.9076*	-1.803
ISTP	-0.1209	-0.1706	–	–	–	–	–	–
ESTP	-0.0308	-0.0532	–	–	-1.247	-1.643	–	–
ISTJ	-0.1673	-0.6701	–	–	-0.1888	-0.3859	–	–
ESTJ	0.2247	0.8373	–	–	-0.2973	-1.033	–	–
ISFJ	-0.6319**	-2.310	-0.6205***	-2.638	-0.0789	-0.1751	–	–
F	2.269***		6.929***		1.063		3.215*	
R^2	0.1849		0.1405		0.1457		0.0711	
adjusted R^2	0.1034		0.1202		0.0086		0.0490	

*This table shows the results of linear regression analyses for two models per major, investigating the contribution of personality types to the standardized grade average. Starting models are containing all independent variables, while reduced models are containing only the significant ones. The estimate label indicates the estimations of the regression coefficients. Label t refers to the value of the t statistics. * Significant at the 0.10 level; ** significant at the 0.05 level; *** significant at the 0.01 level.*

The whole model explained slightly more than 10 percent of the total variance of the dependent variable. In the BI major only the ESFP students showed an inferior performance compared to those with the ESFJ type, but in this case the model was not significant according to the *F* test, thus the result should be treated with caution. In addition to these findings, for both majors there exist reduced models that are significant at least at the 0.10 level. In the case of the BAM major the reduced model explains approximately 12 percent of the variance, and almost 5 percent in the case of the BI major. In the reduced model for the BI major, being female and having an ENFJ personality had a positive relationship, and being an ESFJ type had a negative relationship, to the stipend index. For the BAM major the reduced model showed the same significant variables as the starting one. From these results it can be additionally concluded that for BI students Myers–Briggs personality types played a significantly less important role in academic performance than for BAM students.

Complementing the previously introduced analysis with the 16 personality types, we also examined the relationship between academic success and personality preferences instead of personality types. In this part of the empirical analysis two starting and two reduced models were tested for both BAM and BI majors to reveal how much the four personality preferences contributed to the – standardized – stipend index. Thus the starting empirical model was:

$$STDINDEX = f(SEX, AGE, LOCAL, WORK, PLUSMAJOR, MBTI PREFERENCE) \qquad (2)$$

The DISTANCE variable was left out for the same reason as previously. Reduced models were developed again via the elimination of independent variables not significant at the 0.10 level. Table 9 presents the results of the four linear regression analyses. Starting and reduced models for both majors were all significant at the 0.01 level (tested with the *F* test). For those Business Administration and Management

students who were female, lived in the city of the university or had greater judging preference (i.e. a lower perceiving preference) the standardized average of stipend indices (STDINDEX) tended to be higher, whilst for those who had any work experience it tended to be lower. In the case of Business Informatics students the intuitive and perceiving preferences had a negative effect on their academic performance. Demographic variables showed no impact on stipend indices in the latter major.

Table 9: Linear Regression Models for the Effect of Personality Preferences

Dependent Variable: Standardized Average of Stipend Indices (STDINDEX)								
Independent Variable	Business Administration and Management				Business Informatics			
	Starting Model $N = 210$		Reduced Model $N = 222$		Starting Model $N = 124$		Reduced Model $N = 133$	
	Estimate	T	Estimate	T	Estimate	T	Estimate	T
CONSTANT	0.6807	0.4654	0.3726**	2.222	-0.1393	-0.1039	0.1249	0.3839
SEX	0.3363**	2.154	0.2407*	1.784	0.1608	0.7426	–	–
AGE	-0.0238	-0.3465	–	–	0.2402	1.261	–	–
LOCAL	0.2892**	2.010	–	–	0.1570	0.9000	–	–
WORK	-0.3604**	-2.557	-0.3570***	-2.696	-1.196	-1.244	–	–
PLUSMAJOR	-0.1655	-0.5011	–	–	-0.0031	-0.7369	–	–
INTROVERSION	-0.0044	-1.504	–	–	0.0119	1.969	–	–
INTUITION	0.0032	0.7659	–	–	-0.0063*	-1.161	0.0113**	1.984
THINKING	0.0035	0.8480	–	–	-0.0219	-4.564	–	–
PERCEIVING	-0.0137***	-3.647	-0.0104***	-3.048	0.0197***	0.3208	-0.0226***	-4.973
F		4.123***		9.784***		3.400***		14.186***
R^2		0.1565		0.1187		0.2116		0.1791
adjusted R^2		0.1185		0.1065		0.1494		0.1665

This table shows the results of linear regression analyses for two models per major, investigating the contribution of personality preferences to the standardized grade average. Starting models are containing all independent variables, while reduced models are containing only the significant ones. The estimate label indicates the estimations of the regression coefficients. Label t refers to the value of the t statistics.
* Significant at the 0.10 level; ** significant at the 0.05 level; *** significant at the 0.01 level.

CONCLUDING COMMENTS

The goal of our paper is to contribute to a better understanding of the relationship between personality and career. Our first research question was designed to reveal the personality types of the two selected majors and to assess whether there is a difference between the majors according to the student personality types. The second research question examined the role of personality types as a predictor of academic performance, while the third focused on the same role of the four personality preferences underlying the Myers–Briggs typology. Our data was based on our primary questionnaire survey of 224 BA in Business Administration and Management (BAM) and 130 BSc in Business Informatics (BI) students. To answer the first research question we used frequency and cross table analyses, the second and third research questions were examined with linear regression analyses.

In the case of the first research question, we have found that the most frequent types in both majors were ENFJ and ESFJ; however, the frequencies of the personality types showed slight differences regarding the majors. In terms of the relative frequencies the three greatest differences were found in the ESTJ, ISTJ, and ENFJ types. The differences between the majors were also confirmed by association measures. We found significant deviations between the students in the two majors in terms of their preferences. Male students were more introverted and intuitive in the BAM major than in the BI major, whilst female students tended to be more intuitive in the BI major. If sex was not taken into consideration, an average BAM student was more introverted than an average BI student. Answering the second research question, we showed that in the BAM major INFP, ENFJ, and ISFJ students achieved a significantly lower performance than ESFJ students, who acted as the benchmark as the majority of students fell into the ESFJ group. In the BI major ENFJ-type students produced a better performance while ESFP-type students fared worse than the ESFJ-type. Personality had a lower level of explanatory power in the case of the BI major than in the case of the BAM major. For the third research question, we experienced differences in

the performance predictor role of personality preferences between the two majors, too. The perceiving preference had a significant negative effect on academic performance in each of the majors. Beside this, in the BI major the positive effect of intuition was also detectable.

We draw the conclusion that the two examined majors – even if only slightly – created different frameworks for the effect of personality on academic performance. Other majors may have different patterns of personality preferences and types; moreover, the nature of the relationship between personality and academic success may also vary. However, personality and its impact on academic performance may be affected by cultural traits, as well. Future research might extend our examination to other business and non-business major programs to reveal the common and specific patterns in the contribution of personality to the academic success in business and management education. Future studies might also focus on the use of personality tests in educational and career counseling.

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IBFR

ASSOCIATION TO ADVANCE COLLEGIATE SCHOOLS OF BUSINESS ACCREDITATION: A LONG-TERM PERSPECTIVE

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ABSTRACT

In this research note, we contend that the Association to Advance Collegiate Schools of Business accreditation should be viewed and planned with a much careful and long-term perspective due to the large amount of resources committed. Schools and colleges of business should not be merely joining the wasteful race for accreditation without a careful evaluation of its strategy. We speculate that some schools have unrealistic expectations about the benefits of the Association to Advance Collegiate Schools of Business accreditation which leads to a favorable bias toward being accredited. Over the periods of 1992 ~ 1999, the Association to Advance Collegiate Schools of Business accredited member schools represent a large yet declining percentage of providers of management education as they lost market share to non-accredited schools and for-profit providers, while at the same time, a tremendous growth in the number of accredited members/programs was observed due to the change to a mission-driven accrediting policy. These two contradictory trends suggest that a timely effort of a careful and comprehensive analysis of the Association to Advance Collegiate Schools of Business accreditation is needed.

JEL: A12, A13, D50

KEYWORDS: Accreditation, AACSB

INTRODUCTION

Since the mid-1960s, the United States experienced a sustained increase in college and university enrollment. As a result of this overall increase and the popularity of "business major" since the 1980s, schools and colleges of business also saw an uptick in enrollment (Mohammad, 2000). To attract domestic and international students, schools seek and advertise their accreditations. The Association to Advance Collegiate Schools of Business (hereafter: AACSB) accreditation is perhaps the most sought after stamp of approval for schools and colleges of business.

To obtain an AACSB accreditation a school has to show that the faculty qualifications are up to date along with the time and other resources committed for management education improvements let alone with the resources it takes to be accredited. Due to the substantial direct and indirect resources associated with pursuing and maintaining AACSB status, it only makes economic sense if the benefits derived from the accreditation are larger than the costs. So the key questions become: Is it cost effective or even necessary to pursue AACSB particularly? What are the true benefits and costs of pursuing AACSB? And what would be the results or consequences of having NO accreditation?

We speculate that some schools have unrealistic expectations about the benefits of AACSB accreditation which leads to a favorable bias toward AACSB. A school's long-term reputation and the strategy to keep its management education up to date may be much more important than the accreditation stamp. For example, Harvard B-school went years without pursuing accreditation and it didn't seem to hurt them. There are a lot of top-quality and small private schools that have B-schools and have never pursued

accreditation from any of the agencies. Perhaps the most contradictory, the schools which are showing the largest growth and an almost over the top amount of resources are the non-accredited for-profit places. Further, the costs of securing AACSB measured by the labor hours and other parameters can really be a burden. Therefore, a deeper understanding of the true benefits and real costs is very necessary and could be helpful from two perspectives. First, accreditation should serve the purpose of promoting more consistent quality in management education with the ultimate goal of improving student outcomes. With a clear insight of the accreditation, schools and colleges of business can further their achievement in continuous management education improvements. Otherwise, the costly accreditation may become merely a form of marketing. Second, the accreditation agency may provide more value to its members while it can truly understand the real costs to the accredited institutions. Or, in the long run, the attempt for accreditation can deliver unmeasurable harm to management education.

The major task we embark upon in this note is to provide a qualitative discussion on the benefits as well as on the costs of pursuing and maintaining AACSB using fundamental economic sense. Along with the discussions, we indicate the areas that warrant future research and are in need of systematic and quantitative analysis. This paper is organized as following. Section 2 covers the literature review. The benefits and costs of pursuing AACSB are in section 3. Section 4 provides the suggestions for business schools and the accrediting agency. Section 5 concludes.

LITERATURE REVIEW

Complex demands on management education reflect the demand on organizations and managers. The challenges are derived largely from the constant-changing and uncertain natural of the business world. In this environment, quality management education must prepare students to contribute to their organizations and most importantly, to grow professionally throughout their careers (AACSB International, 2012). In turn, how to distinguish quality management education programs/providers from the average ones becomes a critical concern of students. A parallel attempt of differentiating themselves, on the other hand, is an important strategy of colleges and schools of business.

There are many strategies a school of business can adopt to differentiate itself. Those include long-term as well as short-term. A school's attempt to establish reputation and hence its own "brand", for example, requires long-term strategic thinking and hence needs a substantial long-term effort. Students are attracted to a particular school mainly due to its academic reputation (Zimmerman, 2001). The labor market also differentiates job applicants by the reputation of their graduating schools. According to the AACSB Management Education at Risk report (2002), employers discriminate by offering drastically different rewards to degree-holders depending on the reputation of the school from which they graduated. On the other hand, obtaining well-regarded accreditations such as the AACSB or improving rankings compiled by some major media such as U.S. News would belong to the spectrum of relatively short-term strategies. Unfortunately, the short-term effort does not necessarily lead to the long-term results. However, due to some long-term uncertainties such as the growing trend of professional administrators (Ginsberg, 2013) or short-term needs such as improving student recruitment, colleges and schools of business seem to prefer pursuing and achieving those short-term strategies and targets.

While colleges and schools of business place a very significant amount of resources toward securing AACSB accreditation or improving rankings, the association between the accreditation or ranking and the quality of management education is becoming unclear. Zimmerman (2001) argues that U.S. business schools are locked in a dysfunctional competition for media rankings. This ranking race has caused schools to divert resources form investment in knowledge creation to some short-term strategies aimed at improving rankings. Further, according to Everard, Edmonds, and Pierre (2013), the credibility of AACSB and its value to those who use its brand to determine high quality in the "market" for business schools has been diminished. The current status of accreditation may be leading us into a situation where the users of the

"brand" can no longer determine high quality programs from those with lesser quality. This is encored by Yunker (2000, p.349) - "As long as only a small fraction of operating business schools possessed AACSB accreditation, there was no significant stigma attached to not being AACSB-accredited. But once the proportion of AACSB-accredited business schools reached a certain critical minimum, non-accredited schools began to regard AACSB accreditation as extremely important to their prosperity and even survival." The AACSB accreditation may merely provide a "mark" of quality especially when a school does not have established reputation (Romero, 2008). This is further intensified by the unclear-purposed accreditation standards. In a 2009 article, Lowrie and Willmott argue that the AACSB standards are built for expansionist purposes and not on sound pedagogical considerations resulting in a simple increase in the number of schools being accredited. This is particularly true while AACSB changed its accrediting policy from a more objective set of standards to a mission-driven focus in 1991 which leads to a tremendous growth in accredited schools/programs in the U.S. (Everard et. al,, 2013). As a result, the number of AACSB-accredited institutions has increased by over 75% since 1996 (Francisco, Noland, and Sinclair, 2008). Many of the schools would not have met the standards for accreditation prior to the change to the mission-driven philosophy (Orwig and Finney, 2007).

The official position has always been that the changing of the accreditation standards in 1991 was a timely response to the trend that the consumers of business degrees are increasingly heterogeneous in their needs and preferences. Yet, a number of speculations continue to circulate. Yunker (2000) theorized that such standard changing was due to the attempt of the accrediting agency to avoid the legal liability of unwarranted denial of accreditation. He further suggested that the AACSB's main incentive was to increase the number of dues-paying member institutions. Regardless of the true reasons, the accreditation would help to assure continuous improvement in the management education assuming that many institutions which might otherwise have been content to carry on at a relatively mediocre level of effectiveness, would instead, inspired by the AACSB accreditation, spur themselves onward to a higher level of effectiveness. Yet this assumption is at best premature in the context of the mission-driven standards. The switch may instead largely erode the core value of management education due to the very short-term perspective it implies. Under the mission-driven AACSB standards, schools and colleges of business may designate teaching as their primary mission. Yet, it is considerably more difficult and less reliably to assess teaching effectiveness than it is to access research productivity (Yunker, 2000). This could lead to a dis-association of the accreditation and the quality of management education. Indeed, by examining all accredited U.S. programs, Everard et. al. (2013) shows that since the move to a mission-driven focus in 1991, the AACSB has not achieved its own mission and may have damaged its credibility in the process. According to an AACSB report (2002), in the United States over the periods of 1992 ~ 1999, AACSB member schools represent a large but declining percentage of providers of management education as they lost market share to non-AACSB schools and for-profit providers. Yet, the controversy surfaces while over the same periods, a tremendous growth in the accredited programs was observed due to the change to a mission-driven focus. Hence, although AACSB is still interpreted as the gold standard for business schools, it is losing popularity at least on the consumer side of the market. The reason, we believe, could be that the business-major graduates from AACSB accredited institutions do not deliver the expected premium in their professional qualifications/performance while comparing to those from non-AACSB schools in the job market. The potential employers do not value the AACSB stamp as much as many would expect is a very warning sign.

BENEFITS AND COSTS OF AACSB ACCREDITATION

The Benefits

There are several benefits associated with being accredited by AACSB as claimed by its supporters. Consider, for instance (Hamilton, 2000):
    (a) Increased salary levels for the faculty
    (b) Higher market value of the faculty

(c) More quality pools of faculty position applicants
(d) A higher quality of students
(e) Better jobs perspectives for the graduates
(f) Improved reputation
(g) Better support by the university administration
(h) Greater support by the community in the event of fund raising

The benefits can be roughly grouped into three categories – Faculty-related (i.e. (a), (b), and (c)), Student-related (i.e. (d) and (e)), and School/program-related (i.e. (f), (g), and (h)). While the benefits look substantial, the real questions are: are those benefits realistic? Is accredited by AACSB the only way to obtain those benefits? Are those benefits even correlated with AACSB? Even if it does, is all the time and money necessary justified given it is a labor intensive and costly proposition to get and stay accredited? Most importantly, are those benefits generalizable? We believe those claimed benefits should be carefully examined by some fundamental economic principles.

In the Faculty-related benefits, the basic microeconomic principles suggest that a production factor's market value is determined by its productivity. At the general market equilibrium, the price paid to a production factor would equal to its marginal productivity. Following this line, a faculty's market value would be determined by the quality and quantity of research that she/he can deliver given the fact that the academic market greatly values scholarly contributions. In other words, the market value of a faculty depends largely upon her/his scholarship. Scholarship is the very core of collegiate business schools and institutions of higher education. Two faculty in the same field should have similar market value as long as their research efforts/outcomes are comparable regardless of the AACSB accreditation status of their associated institutions. This is implied by a standard Principal-agent model as well. The principal's (i.e. schools and colleges of business) utility/profit maximization must incorporate the agent's (i.e. faculty) participation decision. The participation condition in the model explicitly implies that the agent's utility derived from her/his decision to participate has to be at least equal to her/his reservation level (i.e. the comparable market value). Given the fact that the comparable market value of a faculty is available information in a mature academic marketplace, at equilibrium, it is of the principal's best interest to offer the faculty a salary level matches to her/his market value. Otherwise, the agents may not participate. However, if the principal choose to lower the cost by providing compensation only for faculty members' time spent in the classroom, such a strategy will build a pool of less qualified faculty which will in turn hurt its long-term revenue. Clearly, this is not a profit-maximizing solution. If we, at large, believe the efficiency of market force, it will produce an equilibrium wage truly reflecting a faculty's value conferred by the market.

Given the accrediting agency's 5-year review window, the AACSB standards merely provide a mechanism to ensure the accredited institutions to document their faculties' scholarship. Hence, the granting of accreditation, we argue, only recognizes the scholarship delivered by the faculty. Yet, a college or school of business can certainly establish those standards and expectations on their own without the AACSB stamp. In fact, most elite as well as reputed schools have their own detailed guidelines and expectations on their faculty in this regard. Those expectations greatly exceed what the AACSB would otherwise demand. Therefore, it is at best unclear to directly attribute the salary and market value of a faculty to the AACSB accreditation.

Further, producing innovative, rigorous research requires at least good colleagues and an environment that largely recognizes and rewards scholarship. Once a school can establish such a vibrant environment, it will naturally attract quality applicants applying to its faculty open positions. While AACSB may provide some assistance in this regard, it is far from clear one can attribute more quality faculty position applicants solely to the AACSB accreditation.

Secondly, in the Student and School/program-related benefits, students are attracted to a particular school mainly due to its academic reputation. This can easily be verified by the number of applicants to a reputed school against it is to a comparable but less reputed place. As afore-mentioned, the employer market is not blind to the differentiation among management education providers either. At equilibrium, the job market tend to generate dramatically different rewards according to the reputation of the schools those applicants graduated from. Moreover, it is primarily the quality of a school's research that drives its reputation (Zimmerman, 2001). Research is central to quality management education. Schools with a good research record attract the best students, top quality faculty, as well as gifts and grants that enable them to retain existing faculty and to enrich their programs. The graduates' job perspective depends largely on the school's reputation as well. A faculty's intellectual creativity and research efforts will most likely be capitalized by her/his teaching, which leads to a more satisfactory learning experience of the students (Demski and Zimmerman, 2000). To obtain a better reputation, a college and school of business needs a long term approach without treating AACSB as the final goal. Colleges of business will have to be more strategic about their research investments and more explicit about assessing the return.

While schools compete for quality students and faculty, the basic competition theory tells us that schools will have to meaningfully strategize to improve their own reputation which serves as the differentiation strategy. However, it is a rather long-term path with un-promised perspective of success. Faced with a prisoner's dilemma, we speculate that many schools select the short-term strategy of pursuing AACSB based on a confusing rationality which attributes a school's reputation and quality solely to the accreditation. It further generates a spurious correlation between the accreditation and the various benefits outlined above. Many schools and colleges of business believe securing AACSB improves their reputation. Yet it is only reputation generating those benefits and the accreditation is merely the by-product. The accreditation observes and recognizes but not necessary motivates educational quality created within an institution (AACSB International, 2012). Indeed, according to Romero (2008), the AACSB accreditation may serve as a mark of quality for the schools and colleges of business that are lack of established reputation.

Finally, it is very probable that in some resource-constrained schools, AACSB serves as the bargaining chip to secure resource allocation commitment from the university level. Hence, the status of accreditation from an internal perspective, namely status and resource allocation within a university, is still valuable. Given this expectation, the faculty job seekers in the marketplace may interpret AACSB as the resource stamp and hence much prefer a school with confirmed accreditation status. In turn, AACSB serves as the marketing spear not only for recruiting students but also for faculty recruitment.

The Costs

The costs of pursuing and maintain AACSB can be substantial as well. Since it is a labor intensive and costly proposition to get and stay accredited, there is a significant amount of nominal cost measured by the time and money necessary for the process. However, we contend that there are also some hidden costs of pursuing AACSB that are not fully understood.

Any forms of accreditation should serve the purpose of promoting more consistent quality in management education with the ultimate goal of improving student outcomes such as job perspectives. Although this purpose is always incorporated in the mission statement of many AACSB accredited schools of business, it is far from clear on how to achieve this goal by merely following the AACSB mission-driven guidelines with a simple and short-term attempt to maintain the accreditation. For instance, it appears to the author that some schools in the process of pursuing AACSB or already obtained the stamp have very questionable course structures/offerings to their students. To the knowledge of the author, there is one school that is pursuing AACSB very hardly offers only fundamental Economics courses (i.e. ECON 101 – Microeconomics and Macroeconomics) to their business-major and MBA students. This is further

compounded by the fact that the university itself does not have an Economics department. Hence, a student would have no opportunity of building up more solid ground that has been proven to be necessary, useful, and valuable in many fields in Business. It is not the author's intention to claim that Economics is superior to other fields in Business. However, it is generally agreed that Economics does offer students some necessary and advance foundation to further their accomplishments in their chosen fields, let it be Finance, Accounting, Management, or others. Without some higher level Economics trainings and exposures, students' foundation would be at best fragile let alone the promotion of more effective business practices, and, most importantly, the delivery of better outcomes for their future clients. This scenario largely analogues to a high school student in a math class trying to learn Calculus. Yet, while the student is very familiar with the basic math operations (e.g. addition, subtraction…), she/he has very limited background in linear algebra. There is no doubt that the student will have great difficulty down the road.

Further, even though AACSB ensures the faculty qualification (AQ or PQ) in its accredited institutions up to date, it does not necessary mean the institution will produce graduates with needed quality. It still depends on how the institution structures its general purpose and long-term goal of management education. Unfortunately, the AACSB guidelines do not offer any clarity for this purpose. This is further intensified by the fact that the accrediting agency switched the accrediting policy from a more objective set of standards to a more subjective mission-driven focus in 1991. As mentioned previously, this transformation results in a tremendous growth in the numbers of accredited institutions/programs but may have damaged its credibility in the process (AACSB, 2002; Everard et. al., 2013). In the previous example, even though all the faculty in that college of business have all the required qualifications and eventually earned the accreditation, their graduates will much likely deliver questionable performance to their future employers and clients due to this very reason. In other words, while schools employ short-term perspective on pursuing and maintaining AACSB, the nominal costs will most surely be transferred to their students but unfortunately without too much long-term promising outcomes. The multi-task principal-agent model (Holmstrom and Milgrom, 1991) also implies that with the emphasis being placed on pursuing AACSB, more resources are being devoted to the process and less resource goes to some long-term tasks such as better-structured course design. The outcome would be a management education that seemingly corresponds to the market demand; yet it produces students who are lack of fundamental basics to comprehend the complexity of the business world.

SUGGESTIONS FOR BUSINESS SCHOOLS AND THE ACCREDITING AGENCY

We contend that AACSB accreditation should be viewed and planned with a much careful and long-term perspective due to the large amount of resources committed. Schools and colleges of business should not be merely joining the wasteful race for accreditation without a careful evaluation of its strategy. A better reputed school can attract quality students, faculty, and hence build up a vibrant environment for its stakeholders. Only in such a productive environment, faculty members can exchange ideas and co-author research. The good quality professors want to work in such environments because it enriches their own scholarship. Likewise, students will benefit largely from the professors who extend expertise and stay very current in their respective fields. Those benefits will largely be capitalized by the institutions as well since during the process, they will be greatly recognized and highly regarded in the very competitive academic marketplace. AACSB is only a natural outcome of this great and long-term effort. The accreditation itself should not be treated as the terminal target. It is an ongoing process to establish the reputation that a school and college of business envision itself. After all, it is the reputation that truly delivers all the benefits.

The accrediting agency can add more value to its members not only by helping them become more proactive in developing strategies to deliver their educational services but also assisting schools and colleges of business formulating their long-term strategy of improving management education. To accomplish this goal, a long-term perspective needs to be greatly incorporated in the accrediting process. Any short-term attempts should be largely discouraged to ensure a continuous improvement in management education.

Further, AACSB should devise a set of reasonable and very specific accreditation standards. Those should be clearly specified to avoid confusion and creating unnecessary gray area in the accrediting process. They should also be highly related to the optimal goal of ensuring quality in the management education. While not all students of Business will become owners or managers of business firms, many will become specialists in one or another area or serve in staff and advisory capacities. Only a quality management education with a mechanism to ensure its continuous improvements can deliver students true insights of the interrelationships between the firm and society.

CONCLUDING COMMENTS

In this study, we discuss the trends in AACSB accreditation and examine the claimed-benefits of AACSB from the perspectives of fundamental economic principles. We believe that many colleges and schools of business have unrealistic expectations about the benefits of being AACSB accredited. As a result, they tend to relate the accreditation to student recruitment and reputation and hence, join the race for accreditation and treat securing AACSB as the terminal target. However, we suggest that the decision of pursuing the accreditation should be carefully weighed against the costs and it has to be planned with a long-term perspective. A school's long-term management education strategy and reputation is much more important and should be carefully formulated. AACSB is only a natural outcome of this great effort.

While the current paper is limited to a qualitative discussion, we believe it worth a great research effort to conduct a systematic analysis of the benefits of AACSB against the suggested costs of not having one. To accomplish the task, a theoretical model as well as a large scale data collection is needed. The model can be formulated using a conventional Principal-agent framework. The AACSB variable as well as a reputation variable should enter the principal's revenue and cost specifications. They should also have a position in the agent's participation condition to capture the fact that potential faculty candidates would prefer a place with good reputation and/or AACSB accreditation. This specification would also help to examine the possible substitution effect of reputation and the accreditation.

The data for the analysis should be in a longitudinal format that includes the accredited institutions along with their accrediting year and their carefully-matched non-accredited counterparts. A pre and post-AACSB analysis on the interested variables (e.g. faculty salaries, student quality, etc.) can be conducted on the accredited schools as well as on the complete panel of institutions (the accredited and their matched counterparts). A system of simultaneous equations regression model should be carefully formulated to address the possibility that AACSB may not be exogenous. There may be some self-selection behavior as well suggesting that the benefits of AASCB may not be generalizable. The model along with the data will deliver more reliable analysis on the issues related to AACSB.

Finally, we speculate the change to a mission-driven philosophy in the accrediting guidelines roots primarily on revenue purposes. While it certainly opens the possibility to be accredited to many schools, the guideline itself inevitably encourages some short-term approach. Hence, further research is needed to conduct a detailed comparison of the accrediting guidelines/standards before and after the change to the mission-driven focus.

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THE IMPORTANCE OF AN ADVANCED DEGREE FOR NURSES IN HEALTH CARE

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ABSTRACT

Current literature supports the promotion of nurses to the administration level focusing on areas that have shown positive outcomes such as improved patient care and staff satisfaction. An advanced degree in business, nursing, or health administration is a valuable choice for nursing administrators in today's health care environment to provide the necessary education for these positions. The primary objective of this study was to determine the benefit to hospitals of an advanced degree in the role of hospital administrators; as well as to investigate the perceptions of current nurse leaders in the hospital setting and their application of an advanced degree in administrative roles. The study was conducted using a quantitative survey designed to evaluate the gaps in the role of the advanced degree and the nursing executive and their practice in the hospital environment. An online survey provided data related to specific perceptions that included recommendations for preparation of candidates for advanced nursing positions, methods utilized to assist nurses to advance, and the requirement of an advanced degree for such positions.

INTRODUCTION

As the healthcare environment continues to change, it has become increasingly clear that hospital administrators must be optimally trained to manage an exceedingly cost-effective, policy oriented yet patient-focused organization. It is under this premise that the clinical leader has emerged at the executive level in hospital administration. Clinical nurses are an ideal choice for positions of leadership in healthcare organizations offering a unique perspective to patient care and administrative responsibilities.

Trepanier and Crenshaw (2013) report that the ageing nursing workforce and the potential increase in demand for nursing services in the near future, nurse executives and other nurse leaders must actively prepare for prospective leadership roles. A registered nurse at the bachelor's level possesses the assessment and technical skills to care for patients. Individuals who progress clinically to the master's level further expand their skill set to include diagnoses and can prescribe for specific needs of the patient. With this strong clinical foundation it is only logical that advanced practice nurses continue their professional journey to become a more visible organizational presence in hospital administration.

Many nurse executives have achieved success through a range of roles and responsibilities. It is commonly accepted that nurse executives at a minimum need to pursue and obtain a graduate-level degree. For those who are interested in teaching in nursing programs, a master's degree in nursing (MSN) may be necessary. For nurses interested in administrative opportunities, an MBA or master's degree in health administration are viable alternatives. There are also programs that offer a combined MSN/MBA. Those with advanced clinical expertise have the ability to gain additional credibility with nurses and other members of the multi-disciplinary healthcare team. For those without clinical practice background this rapport could be difficult to achieve.

According to Lavizzo-Mourey (2012), "to meet our nation's health care needs, we must strengthen the nursing profession at all levels, from the front lines to the administrative ranks". The role of the nurse executive continues to change based on healthcare reform, technologic innovation, consumerism and generational features. However, the need for the development of the applicable knowledge and expertise required is essential to ensure a nurse leader is competent to progress to the executive level. With an aging population of physicians and a limited volume of health care successors in place, there are an increasing volume of nurse practitioners replacing these physicians in primary care and hospital administration settings. There is however limited research specifically focused on the fiscal benefits to a hospital with nursing executives specifically. The primary objective of this study was to determine if there is an added benefit of an advanced degree for those in hospital administration.

The remainder of this paper is organized as follows: section 2 reviews prior studies and information related to advanced degrees obtained by nurses. Section 3 describes the data used and the methodology followed in the study. The results and discussion are presented in section 4. Section 5 outlines the main conclusions, contributions, and implications drawn from this study.

LITERATURE REVIEW

Patton (2012) and Sherman and Pross (2010) note the significant role of nurse leaders in developing and maintaining effective work environments. They also explored the development of leadership skills by using the Nurse Manager Leadership Collaborative Learning Domain Framework competency for development of leaders at the unit level. The Nurse Manager Skills Inventory is a foundational component of a comprehensive initiative of the NMLP to assist nurse managers in achieving their developmental goals throughout their careers. The resulting constructive environment is evident by staff satisfaction, employee retention, improved patient outcomes and improved organizational performance (American Association of Critical Care Nurses website). Sherman and Pross (2010) indicated that there is an abundance of health care literature that continues to show the positive influence that expert, competent, credible and visible leadership has on supporting this framework related to nurse administrators.

Magnet recognition is highly recognized throughout healthcare organizations as the gold standard for quality patient care, nursing excellence with innovation in professional nursing practice. This status is also dependent on leadership grounded in new data and enhancements that support quality outcomes (Caldwell, Roby-Williams, Rush, Ricke Kiely (2009). The establishment of effective and efficient work environments necessitate leadership for nurses at all levels of the organization. The nurse leader supports all efforts to engage staff in achievement at the highest level by supporting care providers with the tools to assist in advancing patient care.

Nursing administrators characteristically enter a career track at the unit level as a clinical care nurse; progressing to clinical nurse supervisor, with the prospect to continue to develop into enhanced management positions. This career progression entails preparation and action. If skills and proficiencies for nursing administrators are developed, it would facilitate the hospital being able to adapt, prosper and expand; resulting in improved patient outcomes and enhanced staff nurse fulfillment. Kleinman (2003) evaluated data from the mid 1990's that noted the importance of developing new paths for staff nurses to be promoted to the role of nurse manager based on clinical proficiency. The promotion of nurses without management and leadership background frequently resulted in unprepared administrators that were unaware of how to function in administrative roles or how to review unit-based operations. Kleinman (2003) noted that the nurse administrator has developed qualities for success that requires business knowledge and skills. Nurse administrators work with clinical personnel, administrators, and patients. Strategic planning and accountability to the hospital board have become responsibilities of nursing administrators.

Although there has been concern regarding fewer individuals entering medical schools; leading to a concern regarding a decrease in the number of physicians; a record number of students applied to and enrolled in the nation's medical schools in 2013 (Association of American Medical Colleges website). There are recognized shortages regarding nurses. Buerhaus, Auerbah, and Staiger (2014) reported projections related to nursing shortages as early as 2000 due to projected retirements of approximately one million nurses; a second concern was that enrollment in nursing programs was declining. Also, due to the aging population, the demand for nurses was expected to increase; especially in areas requiring advanced degrees.

To increase interest in the nursing profession, organizations such as Johnson & Johnsons' *Campaign for Nursing's Futures* provided marketing targeted to promoting interest in the profession; as well as scholarships. Hospitals, health care organizations, and the Robert Wood Johnson Foundation created programs for not only recruiting new nurses to the professions; but also funded programing to retain existing clinical nurses. Due to these recruitment and retention efforts, there was a rapid increase in graduates beginning in 2002. "Beginning in 2004, however, the number of graduated more than tripled to over 30,000 in 2012" for master's and doctoral graduates (Buerhaus, Auerbah, & Staiger, 2014, p. 293). A significant number of these clinical nurses have the opportunity to be promoted to positions of nurse managers and nurse administrators.

Caldwell, Roby-Williams, Rush and Ricke-Kiely (2009) note that the Magnet recognition program was developed by the American Nurses Credentialing Center in 1994 to encourage quality in nursing care; increasing excellence of patient care associated with this qualification. Obtaining Magnet status is considered the highest recognition for nurses. This designation is an example of an organization's and their nursing staff's commitment to delivery of high quality of care to the community and to provide professional advancement. Since the latter part of the 2000s, hospitals have favored hiring nurses with bachelor's degrees versus associate degrees.

Kleinman (2003) developed a survey of 35 nurse managers and 93 nurse administrators to assess the requirements of nurse administrators for role preparation within healthcare organizations. The results revealed that the nurse administrations that obtained master's degrees were more likely to be clinical in nature than non-clinical. The skill set that were determined to be priorities for the nurse administrator focused on strategic planning, finance and human resources. The most desirable type of graduate degree was perceived to be a Master of Science in Nursing (MSN) and a joint Master's of Business Administration (MBA) for nursing administrators.

According to Drennan (2011), one of the outcomes of nurses obtaining masters degrees is the development of leadership, teamwork, change management, and general management competencies. Nurses have options related to choice of master's degrees; Master of Science in Nursing, MBA, Health Care Administration, or the joint MSN/MBA. In many instances, a MSN is needed for individuals teaching in nursing programs.

Executive nursing requires experience in clinical practice and business skills. Swanson and Stanton (2013) suggested that competencies are critical for nurse executives include a worldwide outlook or approach, a working knowledge of technology, expert decision-making skills, prioritizing quality and safety, politically judicious, collective and team building skills, balancing genuineness and performance expectations and coping effectively with change. Additionally, these competencies should include effective communication, relationship management, financial management, medical staff relationship, change management and strategic management. Business degrees, specifically an MBA, provide the necessary management education.

Nursing executives' foster skills and competencies necessary to improve patient care and to train the next cohort of nursing leaders. Although there is a lack of nursing knowledge specific to the MBA degree and

its necessity for administrative positions in healthcare, there is an understanding of the positive influence such a degree provides. With healthcare reform occurring on a global level, nurses in administrative roles understand the importance of the skillset an MBA affords. Antrobus and Kitson (1999) identified the importance of developing nurses and examined the broader socio-political factors impacting nursing leadership. An ethnographic approach with informal semi-structured interviews specific to 24 recognized effective nursing administrators was utilized. The study investigated profiles of effective nursing leaders and their knowledge and skill set base. The perception of these leaders was that their knowledge derived from practice directly or indirectly influenced their leadership role. Further analysis revealed that nursing leaders had certain identifiable skills essential for the nurse administrator. This included working with others to empower other nurses to be a strategic thinker, integrating research evidence with practice, having a clear understanding of self, values, purpose and meaning as well as working well with others to achieve transformational change (Michalik & Kowalewski, 2014).

The results of a 2008 study conducted by the Bureau of Health Professions noted that, "19.2% of RNs who earned a master's degree enrolled in programs with a focus in administration, business, or management, 13.3% focused on education, and 5.9% earned public health degrees" (Gerard, Kazer, Babington, and Quell, 2014). Attainment of higher level degrees are linked to improved patient outcomes. According to Kovner, Brewer, Katigbak, Djukic, and Fatehi (2012) report that the Institute of Medicine's committee, *Future of Nursing: leading Change, Advancing Health*, has set a goal that by the year 2020 80% of nurses will hold bachelor's degrees. There were several factors that motivated RNs to continue with a master's degree or higher that included professional goals and personal goals.

Prior studies demonstrate that an advanced degree for nursing administrators does provide positive outcomes and staff satisfaction (Gerard, Kazer, Babington, and Quell (2014), Kovner, et al (2012). Michalik (et al, 2014) reported that a study by Aiken indicated the need for more extensive research regarding the educational composition of the nurse workforce and the role that it plays in administrative roles. The educational composition of the current workforce requires specific training for administrative roles however; educational models incorporating this additional training would need to be developed to more effectively train future administrators. The focus from clinical care to administration have determined that leadership skills are imperative (Frederickson & Nickitas, 2011). Skills such as interpersonal (verbal and nonverbal), management, inter-professional, and mentoring had an impact on success as an administrator.

DATA AND METHODOLOGY

The study design for this research included a format that elicited personal numeric history such as years of experience and length of employment but also allowed for feedback that was unrestricted resulting in a span of results focusing on the qualities of nursing professionals and the role an advanced degree would play in health care management. This survey established basic demographics such as gender, and allowed for communication of subjective responses not limited to pre-designated replies.

Since each nurse has different views on the role of an advanced degree and career progression, this survey allowed for a manifestation of support for what was already established in the literature search as well as create the need for additional research to evaluate the legitimacy of the current feelings expressed with regard to advanced degrees for nursing executives.

The survey was distributed utilizing Survey Monkey via an email link to individuals on LinkedIn during the summer 2013. The specific groups chosen for distribution of the survey were the American Organization of Nurse Executives, the American College of Healthcare Executives, and local Buffalo, New York healthcare executives.

RESULTS AND DISCUSSION

A total of 100 surveys were completed and reviewed. The respondent population were 85.86% female and 14.14% male representing a variety of levels of management. There were representatives from the hospital unit management levels, directors, Chief Nursing Officer, President, Chief Operating Officer, and Chief Executive Officer. Of the responses, the majority were unit managers or directors.

The number of years of healthcare experience spanned from five years to 50 years. The average years of a position held were between five to 10 years. Sixty percent of the respondents reported that their current positions held the requirement of an advanced degree; 73% obtained that advanced degree prior to their appointment. The degree's that were most represented were the Bachelor of Business Administration, Bachelor of Science in Nursing, Master in Business Administration and Master in Nursing. 80% of respondents agreed that a clinical degree should be required for those in hospital administration.   When asked how they were prepared for their administration positions the answers were varied. 28 respondents responded that they were given no preparation at all; while only 10 respondents felt they were prepared well for advancement opportunities. When questioned about the most accurate way to prepare an employee seeking an advanced position without an advanced degree, 52 recommended mentoring and coaching while only 11 felt an employee should not be offered a position unless they had already obtained an advanced degree.

While the sample size was small and makes generalizability difficult, the results do offer insight into additional research that is needed in regard to this topic. The opportunities were either readily available for advancement or required an individual to leave the organization to obtain an advanced position. It is unclear if a clinical degree would affect this result. Although the degree obtained varied among respondents, over 60% had a Bachelor in business administration degree or non-clinical degree while only 50% of respondents had a Master of Nursing or clinical degree. Doctorate degree's comprised 6% of respondents.

Although the respondents averaged between 25-40 years of employment in healthcare, their average years in their current position were only between five to 10 years. It is unclear if this finding is common in most advanced positions or based is due to the small sample size. It would seem that any nursing administrator with 25 years of experience would be valued in an executive position and would remain in that position for greater than five years. However, a nurse administrator with over 40 years of experience although valuable, may no doubt be looking toward retirement limiting the length of time in their current role. If this were the cause, it would help to support the reasoning that nurses should be encouraged to advance in the organization beginning as early as possible in their career with organizational training and obtaining an advanced degree. These nurses would be able to give an extended period of service to the organization and their wealth of knowledge and experience could advance the organization (Michalik and Kowalewski, 2014). An advanced degree although required for 60% of the respondents in their current positions. As nurses progress in their careers, Although there has been concern regarding fewer individuals entering medical schools; leading to a concern regarding patient care; a record number of students applied to and enrolled in the nation's medical schools in 2013 (Association of American Medical Colleges website). A Master's degree will prepare managers and directors at this level for the changing needs in healthcare in order to maintain a successful organization. Those reaching out for corporate positions may then make the decision to proceed to the doctorate degree.

The primary objective of this study was to determine if an advanced degree was beneficial to nurses in hospital administration. Based on the data collected, there is a significant difference in the number of males and females in administrative roles. An advanced degree has been a requirement for administrative appointments and was required prior to appointment to the position. Most respondents had the impression that candidates for advanced positions should come from within the organization and that networking should not be required. Instead they preferred to have an internal coach or mentor that would reach out to

candidates exhibiting the qualities necessary for promotion. Although financial incentives and flexible scheduling were considered valuable incentives, most respondents seem to prefer a mentor and coach who could guide and direct them in their career path. Additional responsibilities assigned under the direction of a mentor would allow the internal candidates to learn what was expected and encourage retention with the organization. Such responsibilities would include finance, human resources and medical staff affairs. Coaching and mentoring were further clarified within the survey to include either the CNO or an individual with an advanced degree in the organization that could assist with the skills needed for progression. Administrative competencies need to be developed even for those who have completed advanced clinical degree programs. This should include business skills in order to combine clinical knowledge with business operations. The nursing administrator is respected for their similar clinical skill set of those they manage. Increased responsibilities that nursing leaders can impart are the ability to set clinical goals for the organization that are attainable and to communicate and collaborate those goals throughout the organization to those they mentor. Critical thinking based on previous clinical experience is one of the advantages of the nursing administrator; an advanced business degree would guide them to make critical decisions. As healthcare continues to change, the methods utilized for patient care will continue to change and as the hospital organization continues to reform the practice of healthcare it will require decision-making that is creative and idealistic.

Sanford (1994) reported that "chief executive officers (CEOs) felt that the best education of nurses in administration was a bachelor's degree in nursing, combined with an MBA." It appears an MBA provides a better background for the necessary skill set for nurses promoted to positions in administration. One response by institutions of higher education have been marketing MBAs to hospitals and health care facilities and the creation of a hybrid graduate degree, the MSN/MBA. Tuition reimbursement though available at many hospitals, does not entirely compensate monetarily for master's and doctorate degree programs. It has been suggested that hospitals choose prime candidates within the organization and fully pay for the entire cost of an advanced degree (MBA) in order to encourage nurses to continue on in their education. An increase in salary may help to off-set this expense however most hospitals will likely not give an advance without a promotion.

CONCLUDING COMMENTS

The primary goal of this study was to determine the benefit to hospitals of an advanced degree in the role of hospital administrators; as well as to investigate the perceptions of current nurse leaders in the hospital setting and their application of an advanced degree in administrative roles. The study design for this research included a format that elicited personal numeric history such as years of experience and length of employment but also allowed for feedback that was unrestricted resulting in a span of results focusing on the qualities of nursing professionals and the role an advanced degree would play in health care management. Based on the data collected, there is a significant difference in the number of males and females in nurse administrative roles. An advanced degree has been a requirement for administrative appointments and was required prior to appointment to the position. Most respondents had the impression that candidates for advanced positions should come from within the organization and that networking should not be required. Instead they preferred to have an internal coach or mentor that would reach out to candidates exhibiting the qualities necessary for promotion. Although financial incentives and flexible scheduling were considered valuable incentives, most respondents seem to prefer a mentor and coach who could guide and direct them in their career path.

Limitations of this study include the relatively small sample size; a larger sample size would provide more robust data and results. As with self-report surveys, it is possible that responders did not provide accurate responses; although the questions were not overly personal. Including additional questions related as to options the respondents may have chosen instead of the degree completed would have been interesting to evaluate.

Future research related to accountability and inter-professional practice for health care providers could provide data for institutions of higher education offering advanced nursing degrees to assist in decision making related to strategic planning and resource management. Comparing why nurses continue their degrees and in what specific disciplines in different areas of the country could also provide pertinent information related to future recruiting opportunities.

If hospitals were to promote from within, executives would need to make a determination of viable candidates in the organization and take the risk of assisting financially with the expectation that the candidate would complete the program and stay with the organization. Many candidates if promoted or given financial reimbursement frequently leave the organization for more advanced opportunities or better financial compensation. Networking is a very viable option for those who aspire to advance in their career. It creates mentor opportunities as well as a variety of potential job placements. Networking provides a sense of the current healthcare environment and the direction needed for change. With multiple perspectives available to the nurse looking for opportunities for promotion within their organizations, they will quickly build their business sense and plan for any changes that may be necessary. Although it may seem easy to require an advanced degree for any newly appointed nurse executive, many qualified nurses in today's healthcare environment have been in healthcare for many years and are not eager to return to school at a time so close to retirement. These candidates should not be overlooked; they have a multitude of experience. These individuals should be mentored, coached and encouraged to set obtainable goals that will allow them to accept an advanced role while working to achieve their advanced degree.

Incentives suggested for preparing internal candidates for advancement included tuition reimbursement, mentoring, seminars and webinars focusing on leadership development as well as additional responsibilities within the organization to grow professionally. Succession planning that is hardwired within the organization was a suggestion given for internal advancement, however this would require hospital organizations to develop specific curriculum or to partner with a particular university to offer such training to employees. Less costly options included mentoring from those in the organization that had already obtained an advanced degree as well as tuition reimbursement, flexible scheduling and salary incentives.

Hospitals will need to better prepare nurses hoping to advance in the organization. The transition from clinical care to the ranks of administration is not always a seamless one. Clinical expertise and experience frequently do not provide the background necessary for today's administrative roles. Without the prerequisite education, aptitudes, and capabilities; administrators can be deemed ineffectual and unable. An MBA or master's in health care management with its formal business education has been shown to be relevant for the role of nursing administration; providing needed coursework for success.

An advanced clinical degree most likely should not be required for those in the Chief Financial Officer position of the hospital organization; however an argument can be made to show the benefits of a clinical degree for those at the corporate level including the president, vice president, chief operating officer and chief executive officer. The dual MSN/MBA appears to be the best alternative for nurses moving into administration; providing additional clinical as well as the business education fulfills the educational requirements. Any nurse looking to advance their career should seek out opportunities and accept opportunities that presents to increase their working organizational knowledge; especially with the interactions with different departments. The more assignments, situations and challenges that a nurse can expose themselves to will prepare them for an advanced role. These opportunities will no doubt take them outside of nursing, but they will continue to have an effect on patient care and will provide value to the organization.

Healthcare leaders need to have knowledge in health and social policy as well as management and research. However nursing practice is key and cannot be lost in the process since this is the foundation of patient

care. Career paths for nurses should be revised to include political, managerial, academic and clinical domains. This study has provided an analysis of the current literature within the context of nursing administration and the role of an advanced degree. It has examined nursing leadership and supports the value that nurse executives can provide in senior level and corporate administration roles in healthcare settings. In addition it has shown what possibilities are available for growth of those looking to advance to higher levels of the hospital organization.

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SUCCESSFUL IMPLEMENTATION OF WRITTEN COMMUNICATION ACROSS AN ACCOUNTING DEGREE PROGRAM

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ABSTRACT

Both the accounting profession and faculty recognise the importance of written communication as a skill business graduates need to master. However, in an already crowded syllabus the problem for educators is how to get time to devote to soft skills such as communication. This study evaluates a program adopted by the accounting discipline of an Australian University aimed at improving the written communication skills of their graduates. The teaching, assessment, evaluation and feedback of written communication were embedded throughout a three year degree program. Specifically one first year, one second year and one final year course formally taught and evaluated the skill using a consistent assessment rubric which contained six criteria applicable to written communication in an accounting environment. The final year assessment of the skill was then compared against three previous years of such assessment before the new program was adopted. The evaluations were across two campuses with different student demographics as regards nationality. Significant improvement was noted at both campuses. The implications are considered important in that they demonstrate soft skills such as communication can be taught and improved upon throughout a degree program if they are integrated and supported appropriately.

JEL: 120, 129, M10

KEYWORDS: Written Communication, Accounting Education, Soft Skills, Teaching and Evaluating, Professional Accreditation

INTRODUCTION

Written communication skills are critical for accountants. Both the academic and professional literature are clear on this. Siriwardane and Durden (2014) cite 19 academic studies over a 40 year period focussing on oral and written communication. Many disclose weaknesses in written communication and even more worrying, differences between academic and professional accountants as to the importance of the skill during career progression. As regards the professional bodies, there appears international agreement as to the importance of the topic. In the USA Lingfelter and Umansky (2010) noted how many accounting firms complain that their new employees do not possess the requisite writing skills. In Australia Ogilvie (2006) noted how clients were perceived as leaving accounting firms partly due to the poor communication skills of the firms' employees. This was supported by Rumney (2006) who noted the National Training manager of one of the "Big 4" accounting firms bemoaning the difficulty of obtaining recruits with appropriate communication skills. Similarly in the UK Morgan (1996) noted accountancy firm employers' dissatisfaction with the written communication skills of new employees. Hassell and Joyce (2014) summarise the synergy between academic and professional requirements when they point out how almost every professional accounting body and academic organisation has highlighted the importance of communication skills The problem for accounting academics however is how to incorporate time to improve students' written communication into an already crowded accounting curriculum. The competence

requirements set by the various professional accountancy bodies are significant. The International Federation of Accountants (IFAC, 2003) the global umbrella body for all professional accountants, has done extensive research on the future of professional accountants, resulting in the formulation of International Education Standards (IESs). The proposed framework summarised in these documents lists knowledge requirements and other skills all potential accountants should possess when entering the profession. To cover all these knowledge and skill requirements within the confines of a three/four year Business/Commerce degree program is therefore challenging, and some of the so called "soft skills" (as described by Wilson (2014)) such as written communication, may suffer as a result.

This provides the motivation for the current study. The authors' University in Australia has clearly defined assurance of learning (graduate attribute) goals it intends its commerce degree graduates to attain. One of these is *written communication*, defined in the University's Graduate Statement pamphlet, under the **"**Effective Communicators and Team Members" section as, the:

> ..... *capacity to communicate effectively with others in writing.*

The Accounting Discipline of the Business School evaluates written communication skills of its final year students by way of formal assessment in a final year course. This Accounting Discipline supports two distinct campuses. One has predominantly domestic students whereas the second campus has a significant proportion of international students for whom English (the language of instruction of the University) was not their first language. The written communication results at both campuses were considered reasonable, based upon the specific demographics of the campus, but improvement was deemed feasible.

Additional motivation for the study was derived at the national level by way of an Australian Business Deans Council (ABDC, 2010)) project. This project seeks to collaboratively develop and implement a national model of expert peer review for benchmarking learning outcomes against nationally-agreed threshold learning outcomes. These were developed under the ALTC (a sub-committee of ABDC) 2010 *Learning and Teaching Academic Standards* project. Accounting was the first discipline selected and written communication is the attribute being tested. The accounting discipline at the authors' university therefore decided to dedicate significant effort into evaluating the feasibility of improving written communication, in order to satisfy both internal and external requirements.

The objective of the current study therefore is to examine whether written communication skills can be improved in accounting students, if a concerted effort is made to achieve this aim. The Accounting Discipline integrated a program whereby written communication would be specifically addressed, taught and assessed in one first year course, one second year course and one final year course across a three year Bachelor of Commerce Degree program. The results of the final year students were then compared to their previous cohorts at both campuses. Significant improvement was discovered in both after the two year trial. The implications of the study are considered significant. If written communication is to be treated as an important goal accounting students have to achieve, and the accounting profession appears to demand this, then appropriate time must be given to its instruction during a degree program. The current study appears to show such an investment can be worthwhile even with students who study overseas in a language which is not their primary means of communication. The remainder of this study is structured as follows. A brief literature review of the importance of written communication to the accounting profession and academics follows. The methodology of the current study is then described. A results section follows with a final section summarising the study and offering some concluding observations.

LITERATURE REVIEW

A review of literature from the professional accountancy bodies was conducted to support the concept of the importance of written communication for accountants. The requirements of a number of prominent

professional accountancy bodies were compared in respect of the technical knowledge and skill capabilities required of members. The bodies surveyed include the Institute of Chartered Accountants in Australia (ICAA, 2013), the Canadian Institute of Chartered Accountants (CICA, 2013), the American Institute of Certified Public Accountants (AICPA, 2102), the South African Institute of Chartered Accountants (SAICA, 2012) as well as the global body the International Federation of Accountants (IFAC, 2012). Table 1A summarises the knowledge requirements and Table 1B the skill requirements.

Table 1: a. Professional Accounting Bodies – Knowledge Requirements

ICAA	CICA	AICPA	SAICA	IFAC
CA Foundation (Business knowledge, ethics, IT, communication	Organisational effectiveness, control and risk management Information and IT	Regulations (ethics, law) Financial analysis Human Resources Information Technology	Supportive subjects Information technology	Organisational and business knowledge IT knowledge and competencies
Financial Reporting and Assurance	Finance Assurance	Financial accounting & reporting Internal Auditing; Control environment	External Financial Reporting Auditing Taxation	Accounting, finance and related knowledge Auditing; Control environment
Strategic Business Management	Performance measurement	Cost Management Budgeting, Forecasting and business planning Treasury Management	Managerial Accounting & Financial Management	
Taxation	Taxation	Taxation		

This table presents the knowledge requirements of professional accounting bodies worldwide.

Table 1: b. Professional Accounting Bodies – Skill Requirements

ICAA	CICA	AICPA	SAICA	IFAC
Innovative problem-solving	Problem-solving	Leadership skills Strategic & critical thinking skills	**communication skills**	Personal skills Interpersonal and
Forward-thinking change management	Management skills Adaptability to change		Intellectual skills Interpersonal skills Information skills	**communication skills** Intellectual skills
Technology-literacy	IT skills	Technological adeptness	Professional values	Technical and functional skills(including IT proficiency)
Collaborative team work capable **communication** of shared understandings	**communication**	**communication skills**		Organisational and business management skills

This table presents the skill requirements of professional accounting bodies worldwide.

It is clear from both tables that the knowledge and skills required by the various professional bodies correlate to a large degree. The specific requirements mentioned with regard to communication skills are highlighted in bold in Table 1B. It is clear that all the professional bodies recommend accountants be effective communicators, both written and oral. It is a critical skill all bodies require. An analysis of academic literature notes criticism of the written communication skills of accountancy students and it appears little has changed in the last 50 years. In 1963, Roy and MacNeill opined:

What is the outstanding deficiency of college graduates? The answer has come back in unison — the inability to communicate orally or in writing. (p. 58).

Little had changed by the 1970s, with Andrews and Koester (1979) noting how practitioners were actually holding accounting higher education providers responsible for the poor state of graduates' written

communication skills. In the 1980s and 90s the trend continued. In Australia, O'Leary (1991) circularised 23 accountancy firms and the number one weakness they noted in their graduates was poor written communication skills. The new millennium only notes a continuation of the trend. Christensen and Rees (2002) noted the need for improvement in communication skills of accounting graduates and to the present day, as the Hassell and Joyce (2014) comment referred to in the introduction attests, it is still an area considered in need of improvement by both academics and practitioners.

METHODOLOGY

As mentioned in the introductory section, written communication is considered an important graduate capability for accounting majors at the participating University. Students are instructed in the topic and assessed in several courses throughout the Degree programme. Appendix 1 shows the mapping of written communication instruction and/or assessment through the Bachelor of Commerce Program. 11 of the 24 courses in the Degree formally touch upon written communication and it is formally evaluated in seven of them. The final year course *Auditing* is the last degree course in which written communication is assessed. As mentioned previously, results of the written communication evaluation at this final stage of the degree program were considered adequate, but in need of improvement. The new initiative, commencing in 2012, was undertaken with the intention of significantly improving these final year evaluations so that the students on leaving University to commence work in accountancy firms as trainees would have better communication skills that their previous cohorts.

Therefore it was decided to take the results of the 2011-2013 final year cohorts as a base and compare the 2014 cohorts' (the first group to go through the revised system, explained below) final year results to see if improvement had been achieved. The international campus had 149 students (Table 2) studying auditing in this semester and the domestic campus had 124 students (Table 3). The assessment of the final year *Auditing* course evaluation of written communication was based on how well the students performed in one exam question in their mid-semester test. A rubric listing 6 criteria for written communication was used to evaluate the written response to a discussion question. The rubric is listed at Appendix 2. This results analysis therefore yielded 792 individual criteria evaluations for the international campus (Figure 1) and 696 individual criteria evaluations for the domestic campus (Figure 1). An examination of the results of this evaluation of written communication for 3 years, from 2011 to 2013 (discussed in the results section below) had shown no significant difference between the three cohorts. This result was consistent at both campuses.

Revised System

The proposal to improve written communication recommended the following revised approach:

(i)   Written communication is formally explained and assessed in a core first year, second year and third year course; and
(ii)   A standard rubric is used each time.

The benefits of the above approach are many. Firstly, by including an evaluative written communication item each year, it was demonstrated to the students, the Accounting Discipline's commitment to the project. In other words, when graduate capabilities programmes and objectives were explained to them, the subsequent regular embedding of assessment of the skills into the program reinforced the importance of the issue i.e. it was not altruism simply to appease the accreditation requirements of accounting professional bodies, the accounting teaching staff were serious about it. It was hoped students will, by year three, finally realise just how important written communication must be in the accounting environment. Second, by standardising the assessment evaluation tool (the rubric) of written communication the students will, over the three years become very familiar with the process and so should perform well in the final evaluation. Written communication was therefore taught and assessed as follows over the three years.

First Year – Accounting Information Systems Course Instruction

Accounting Information Systems: is the first course that addresses written communication. Written communication is assessed as a mandatory question in the final exam worth 5% overall. In a lecture the marking rubric (Appendix 2) is introduced and every criterion explained. Then a sample question is used to practise on and advice is given by the lecturer how every criterion can be incorporated in the solution. Prior to the exam, another sample question is provided with solution comments on the *Blackboard* site for that course. Students are further advised that in the final exam they will be required to write a letter or report to a third party, such as the management of a company. The letter or report format has been selected to facilitate written communication in the real world when theoretical knowledge is applied in a particular context. Additionally, this format enables the student to incorporate a layout and to structure the argumentation accordingly.

Assessment

The exam question is listed below. The written communication portion is weighted with 5 marks out of 60. The duration of the exam is 120 minutes (with additional 10 minutes pre-writing perusal) allocating 10 minutes to the students to answer the question and address all six criteria in the marking rubric.

K&T Co. is a medium-sized, industrial instrument manufacturer supplying precision equipment to manufacturers in South Australia. The company is 10 years old and uses an integrated ERP system. During the past year, sales have increased dramatically by 30 % but an external audit has shown substantial deficits in the internal controls.

Write a letter to the management explaining the importance of internal control for fraud prevention. Explain two fraud techniques in detail and explain how the company could use internal controls to prevent and detect them.

As mentioned above, it was considered that this task would enable students to demonstrate their written communication skills by incorporating an appropriate layout, by structuring their arguments appropriately and addressing the basic concepts of spelling and grammar.

Second Year – Financial Accounting Course

Instruction

During the semester, students were required to submit two assignments. It was individual work. Each assignment included two parts, one is a theory related question(s) and the other is a practical question(s). For the theory-related question(s), students were asked to prepare the written portion of the assignment as per the rubric criteria (Appendix 2). Each of the six criteria; hygiene, logic and flow, denseness, layout, persuasiveness and brevity were again explained to the students during a lecture prior to each assignment hand up. In tutorials the content of the assignments was again discussed and the importance of a persuasive written report, to support the accounting treatment, was again emphasised. Finally the rubric was put up on the course *Blackboard* site for the students to refer to.

Assessment

Each assignment was worth 5% of total assessment for the course over the semester. The written communication portion of each assignment was worth half the marks and technical content the other half. Marks for written communication were awarded based on the rubric criteria. The followings are two examples of theory related questions.

A stockbroker advises a client to "buy preference share…………………………With that type of share…………[you] will never have to worry about losing the dividends". Is the broker right? If so, please explain.

Your friend, Kim, has little accounting knowledge and is somewhat confused as to the understanding of intangible assets. Kim asked you to explain the following question "Should internally generated intangible assets be treated in the same way as acquired intangible assets'. (Students were asked to prepare an explanation for Kim under AASB 138).

Students had at least 4 weeks notice for each assignment, so in this instance there was no issue of time constraints hampering performance as regards written communication.

Third Year – Auditing Course

Instruction

At the commencement of the course, in the first lecture, written communication was flagged as a graduate capability taught in this course. The students were reminded of the written communication assessments they had performed in years 1 and 2 in the two courses listed previously. Students were then re-introduced to the rubric and taken through the six criteria again. Students were then informed of the assessment item which would evaluate their written communication skills in this particular course. This time it was not a memo as part of an assignment. Rather, it was a written question forming part of their mid-semester exam, the exam being worth 20% of overall assessment for the course. One of the three questions making up the mid-semester would be worth 50% of the paper. Half of the marks for this question were for technical knowledge and the other half would be allocated based on how well they communicated their answer in writing. Students were then given examples of previous written exam questions with examples of excellent, good and poor written responses. Appendix 3 provides and abridged version of this example. A full file with such examples was posted on the course *Blackboard* site together with the rubric so the students could study it at their leisure in the weeks before the exam.

Assessment

The exam question is listed below. As the exam ran for 90 minutes (with 10 minutes pre-writing perusal) it was estimated the students would allocate 45 minutes to the question which should give them ample time to design and then write down an answer in an acceptable written communication format, addressing all six criteria.

Online Ltd, sells tickets to concerts and sporting events all over Australia and New Zealand. They engaged the firm of Tick and Flick, CAs, to conduct the statutory audit of their financial statements and they have been their auditors for the past four years. The audit for this year was duly completed and an unmodified (clean) audit opinion was expressed on the financial report. Online Ltd's shares are traded publicly on the ASX and following the release of this year's financial report (which showed a net profit of $4M), the share price increased by 10%. In reliance on the financial report and the auditor's opinion, Websites Ltd. a multi-national media conglomerate, purchased 10,000 shares for $20,000, with the intention of buying even more shares in the future. Six months later it was revealed that Online's 'true profit' was only $2M, due to the fact that Online had capitalised most of its computer expenditure, instead of expensing it to repairs & maintenance. Websites Ltd. therefore lost interest in future investment in Online and so sold their shares. However, the highest price they could obtain was $10,000. Hence, Website Ltd. has brought legal action against Tick and Flick under Common Law for their loss in the value of Online's shares. Required:

(A) Can Website Ltd. recover their loss? Explain why, or why not. Cite legal cases to support your argument.

(B) Are Tick and Flick negligent in this situation? What factors would the courts consider in deciding whether or not they were negligent? What defences could they argue? Cite cases to support your argument.

The question was on auditor's liability to third parties, a topic covered in lectures and tutorials. This topic area was chosen as it was considered a good subject area to allow students to express their understanding and explanation of the various legal principles involved. The question appeared well enough constructed to allow objective evaluation of clear and logical expression, persuasive discussion, lucid thought flow as well as the traditional written communication staples of grammar, spelling etc.

Feedback to Students

In all three courses the written communication piece was marked in accordance with the rubric. The rubric results were then posted to a customised software package and students received feedback with their overall mark for the written communication and a breakdown over the six criteria. It was considered this feedback was critical as it showed the students how they could improve, next time they addressed the rubric. Also it highlighted the importance of the overall, teach, assess and provide feedback approach to this important skill.

RESULTS

When the results of the 2014 final course (*Auditing*) assessment of written communication were reviewed, overall the students as a cohort fared significantly better than in previous years. Improvement was evident at both campuses. Let us consider the larger campus in the first instance. This is the campus with more international students than domestic, so for ease of explanation it will be referred to as the international campus from here on. Figure 1 shows two graphs of the distribution of results for groups at both campuses. The raw number scores in the graphs are the summation of the individual six criteria as per the rubric in Appendix 2. Each criterion is individually graphed and then all 6 combined. As per Figure 1 graph 1, the international students, 29% of students were assessed as excellent overall. 35% achieved a rating of very good. 22% were assessed as good, 11% as satisfactory and only 2% were deemed unsatisfactory. The percentage figures were arrived at as follows: 29% = 232/(232+280+177+90+13).

This snapshot of the raw distribution does not really indicate how well the students are faring as regards written communication. (It does allow comparison with the cohort at the other campus, which is discussed below.) However when it is compared with the historical results of this campus, evidence of significant improvement appears. Table 2 provide the raw data with which to support this conclusion.

Figure 1: Analysis of Results - Campus International and Campus Domestic
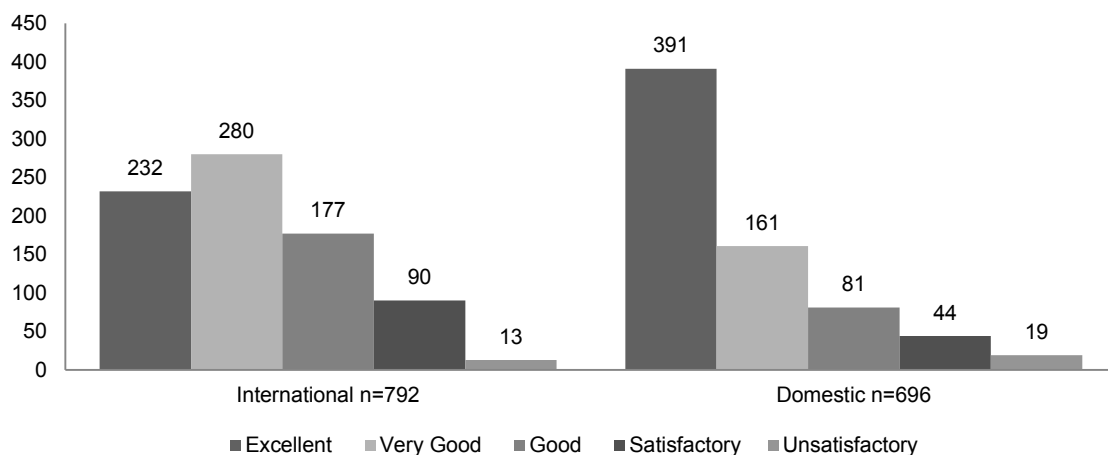
This graphs represent the distribution of students overall evaluation of written criteria across both campuses

As per Table 2 the total of students who received a very good or above rating for the 3 years from 2011 to 2013 were 38% (24+14), 35% (19+16) and 37% (29+8) respectively. This was a very consistent trend. However the 2014 cohort, the first group who had 3 years of focus on written communication, raised this percentage to 64% (35+29). This is a very significant improvement. Similarly, at the lower end of the scale the percentage of students deemed unsatisfactory fell to just 2% whereas in previous years this had ranged from 8% to as high as 18%. Finally, as a validation check the overall distribution of results for these 4 semesters was checked and no significant fluctuations were noted in overall performance. Hence there is no reason to consider this particular cohort were any better than previous groups.

Table 2: Comparison of Written Communication Results by Cohort - Campus International

	2014 (%) n=149	2013(%) n=260	2012(%) n=239	2011(%) n=265
Excellent	29	8	16	14
Very Good	35	29	19	24
Good	22	31	11	17
Satisfactory	11	24	35	27
Unsatisfactory	2	8	17	18

This table presents a comparison of the results of this year's cohort to those of previous years at the international campus

Let us now consider the other campus which had predominantly domestic students, and so will be referred to from here on as the domestic campus. Figure 1 graph 2, provides the distribution of results for this group. As is evident, from a simple comparison of the two graphs in Figure 1, the domestic campus students fare better at written communication than their international campus cohorts. This is to be expected. As per Figure 1 graph 2, 56% of the students at the domestic campus were assessed as excellent overall. 23% achieved a rating of very good. 12% were assessed as good, 6% as satisfactory and 3% were deemed unsatisfactory.   Here again the percentage figures were arrived at as follows: 56% = 391/(391+161+81+44+19). When these figures were compared with the historical results of this campus, evidence of significant improvement was again apparent. Table 3 provide the raw data with which to support this conclusion.

As these students were starting from a much stronger base, English being the native language of the vast majority of this group, a review of the top ranking provides the evidence of improvement. Figures for 2011 were no longer available but as per Table 3 the 'excellent' ratings for the 2 years from 2012 to 2013 were 34% and 35% respectively, consistent figures. But the 2014 cohort, fortified with 3 years of focus on written

communication, raised this percentage to 56%. Analysis of students who received a very good or above rating for the 2 years from 2012 to 2013 reveals percentages of 74% (40+34) and 68% (33+35) respectively. This increased slightly to 79% (23+56) in 2014. This increase is not as dramatic as for the international students but as mentioned previously this cohort of students started from a much stronger foundation and significant improvement is evident when one evaluates how many moved from the second tier of 'very good' to the top tier of 'excellent'. Again validation tests were performed to compare the overall results of these cohorts over 3 years and no significant differences were noted. A comparison of Tables 2 and 3 also shows that the students at the domestic campus consistently over time out performed the students at the international campus. Hence here again there is no reason to consider the cohort at either campus was significantly different from previous years.

Table 3: Comparison of Written Communication Results by Cohort - Campus Domestic

	2014 (%) n=124	2013(%) n=111	2012(%) n=108	2011(%) n=101
Excellent	56	35	34	n/a
Very Good	23	33	40	n/a
Good	12	22	18	n/a
Satisfactory	6	7	6	n/a
Unsatisfactory	3	3	2	n/a

This table presents a comparison of the results of this year's cohort to those of previous years at the domestic campus.

SUMMARY AND CONCLUSION

The purpose of this paper is to ascertain whether written communication skills of trainee accountants can be improved. This is a desirable outcome because as Burns and Moore (2008) note, the increased importance of communication in accounting is supported by evidence from the profession itself. As a result most Universities, including the authors' of this study's, list written communication as a skill to be taught practiced and assessed during an accounting degree program. Again, like many other Universities, the accounting degree program does not currently have a 'stand alone' business communication course in which to teach written communication. So the dilemma remains for instructors, how to improve the so called "soft skills" over the course of a full degree program, with its many other requirements.

This study analyses one such approach. Two cohorts of final year accounting students were therefore selected as subjects for the study. They were then subject to a formal 'teach, evaluate and report back' approach, in one core course each year of their three year degree. A standardised rubric was introduced in year 1, demonstrating to students six criteria they needed to address to assist in achieving good written communication skills. They then revisited this rubric in second year and third year, performed some assessment procedures and received detailed feedback on each occasion.

The final evaluation of written communication skills was found to be a significant improvement on those of three previous years (those cohorts not subject to the new approach) for both cohorts. This tends to suggest the written communication skills of both domestic and international students can be improved, if a significant effort is made throughout their degree program to achieve this. Certain limitations of the study must be considered when evaluating the results. These limitations also offer avenues for future research. Firstly, the subjects came from just one university and whether the findings can be generalised to other universities is a moot point. Future research could expand the study to universities in other jurisdictions. Second, the assessment tool used in two of the three cases in this study was an exam setting, by definition a setting inherent with its own pressures.

Other assessment methods may offer a better way of evaluating the skill. This again offers areas for extension of the current research. As regards the format of the assessment item, this can vary. It could be a simple individual piece of assessment (stand alone). For example write a letter of advice or a brief memo.

Alternatively, it can be incorporated into an assignment evaluating some technical content as well as testing the writing skills. These alternative methods could be compared to the method used here in two of the three cases, evaluating some portion of an exam question(s) during a mid semester or final test, to evaluate whether they come up with more reliable findings.

The implications of the current findings are considered significant. As long as students are consistently reminded of the importance of written communication and made to practice regularly (at least once a year) by year three, students should be aware of the necessary criteria and so should perform well in written communication assessment. This helps demonstrate to outside stakeholders how accounting academics can indeed attempt to improve written communication skills developed over the duration of a three year program.

This in turn could negate the criticisms noted by researchers such as Andrews and Koester (1979) mentioned previously, whereby accounting practitioners bemoan the efforts of accounting faculty to improve this important skill. If accounting faculty are to deliver graduates with the requisite skills required by the accounting profession then initiatives such as the one in this study are important. This is because they demonstrate it can be done without major impacts on resources. By simply integrating into an existing program certain measures, specific graduate capabilities can be addressed and improved upon.

Appendix 1: Program Mapping of Written Communication

Bachelor of Commerce (Accounting) Curriculum Map (Abridged)

Course	Acc Inf Syst	Intro to Bus Law	Corp Fin	Fin Acc	Company Acc	Mgnt Acc	Company Law	Acc Theory & Practice	Strat Mgmt Acc	Revenue Law	Auditing
The B Commerce graduate will:	✓✓ (b)	✓ (a) ✓✓ (b)	✓✓ (b)	✓✓	✓ (a) ✓✓ (b)	✓ (b)	✓ (a) ✓✓ (b)	✓ (a)	✓ (b)	-	✓✓ **(b)**
1.2 Demonstrate core competencies in communication and presentation skills in (a) oral and (b) written communication	**XX (b)**	XX (b)	-	**XX(b)**	X(a) XX(b)	(b)	XX (a) XX(b)	XX (b)	X(b)	X (b)	**XX (b)**

Key: Teaching & learning activities (TLAs): ✓ = objective is addressed through TLAs. ✓✓ = very strong – TLAs designed to promote thorough, deep & active learning in relation to desired objective Code for assessment: X = objective is addressed. XX   = very strong – thorough, deep assessment of objective

Appendix 2: Written Communication Rubric for Accounting Courses

Marking Criteria Written Communication Skills					
Criteria	Excellent	Very Good	Good	Satisfactory	Unsatisfactory
Hygiene (Loading 20%)	No spelling, grammatical, punctuation &/or repetition mistakes.	Minor spelling, grammatical, punctuation &/or repetition mistakes.	Some obvious but inconsequential spelling, grammatical, punctuation &/or repetition mistakes.	Numerous spelling, grammatical, punctuation &/or repetition mistakes of consequence, but they do not pose an insurmountable challenge for the reader.	Contains numerous spelling, grammatical, punctuation &/or repetition mistakes that pose an insurmountable challenge for the reader.
Logic and flow (Loading 20%)	The ideas are arranged in an extremely logical, structured and coherent manner. Sentences are clearly linked.	The ideas are arranged in a very logical, structured and coherent manner. Sentences are mostly linked.	The ideas are arranged in a mainly logical, structured and coherent manner. Sentences are principally linked.	The ideas are somewhat logical, structured and coherent. Sentences are also sometimes linked.	The ideas are not arranged in a logical, structured and coherent manner. Sentences are not linked.
Denseness (Loading 15%)	Abbreviations and wordiness always appropriate. No inappropriate jargon	Abbreviations and wordiness almost always appropriate. Little inappropriate jargon	Abbreviations and wordiness mainly appropriate. Some inappropriate jargon	Abbreviations and wordiness sometimes appropriate. Instances of inappropriate jargon	Abbreviations and wordiness rarely appropriate. Many instances of inappropriate jargon
Layout (Loading 15%)	Headings, sub-headings, point formats, always appropriate and correctly laid out.	Headings, sub-headings, point formats, almost always appropriate and correctly laid out.	Headings, sub-headings, point formats, mainly appropriate and correctly laid out.	Headings, sub-headings, point formats, sometimes appropriate and correctly laid out.	Headings, sub-headings, point formats, rarely appropriate and correctly laid out.
Persuasiveness (Loading 15%)	Language is always appropriately persuasive. It makes addressees feel very confident with the advice given.	Language is mostly appropriately persuasive. It makes addressees feel fairly confident with the advice given	Language is mainly appropriately persuasive. It makes addressees feel somewhat confident with the advice given	Language is sometimes appropriately persuasive. It encourages a little confidence in the addressee	Language is rarely appropriately persuasive. It does not encourage confidence in the addressee
Brevity (Loading 15%)	The contents are expressed completely but with minimal use of language.	The contents are expressed completely and with appropriate limits on the use of language.	The contents are expressed completely and with some limits on the use of language.	The contents are expressed completely and without too much use of language.	The contents are expressed completely but with too much use of language.

Appendix 3 – Examples of Written Communication Assessment of Exam Question (Abridged)
Example Question (Abridged)

Robert and Mirelle have been running their textiles business as a partnership. At a partner's meeting they decided to transfer a major part of their shares to their three children, their son (Alan), one daughter (Sweetie) and the youngest daughter (Fiona) who holds a degree in management. Fiona told her parents that before doing any transfer, it is necessary to convert the partnership into a company. During the first meeting of the company, Fiona informed all the shareholders that the company, given its size, needs to have its financial statements audited every year. Finally the board agreed that the company makes an invitation to tender for the audit of the company's financial statements. You are manager in one of the audit firms in the city and the audit partner has decided to bid for the tender. He has asked you to prepare brief answers to the following questions, Fiona has asked him.

(i)   Briefly explain what does the audit involve?

(The following three examples were of course hand written initially. They have been typed so you can easily evaluate them)

Excellent Written Communication. 10 Out Of 10, Followed All Six Criteria As Applicable

      (i)   Briefly explain what does the audit involve?

The audit will involve evaluating the company's financial statements to provide assurance to the company, not insurance, on their accuracy. An audit has the purpose of providing a client with reasonable assurance that their representation of accounts is true and fair. These accounts are prepared in a way that is suitable for viewing by a third party such as shareholders. The audit will serve to be objective, independent and undertaken in a professional manner.

Good Written Communication. 7 Out of 10, Followed Criteria as Applicable to a Reasonable Extent

      (i)   Briefly explain what does the audit involve?

An audit generally involves an independent qualified professional is employed to test controls and procedures and report any misstatement or fravdulent activities to the relevant departments. Ie. ASLC and management. An audit gives the reader assurance the statements are free from bias and misstatement.

Unsatisfactory Written Communication. 4 Out of 10, Failed to Followed Several Criteria as Applicable.

      (i)   Briefly explain what does the audit involve?

Auditor is a process of objectivity which is doing by competence professional practitioner by controlling and monitoring of assertion information by preparers, then for enhancing the confidence of users eg shareholder, public… auditor collecting sufficient properiate audit evidence and comperouise and evaluate them against accounting and auditing standard by corresponding assertion information and communicating the result to user of information in addition their standard and independence report.

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THE IMPACT OF ETHICAL WORK CLIMATES AND NATIONAL CULTURE ON ACADEMIC ELITES: A CROSS-CULTURAL COMPARISON OF BUSINESS SCHOOL FACULTY

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ABSTRACT

The purpose of this paper is to examine the relationship that Ethical Work Climates and National Culture have on business faculty in universities. Most studies involving ethics focus on students or professions outside academia. We felt that looking at the teaching profession and in particular business faculty across cultures would provide an insight to the question of whether academic elites were influenced by their organizational culture or national culture when introducing the subject of ethics to their students. The most significant difference was in the egoistic climate. Contrary to the hypothesis that the United States would score higher, it in fact scored the lowest of the three. It also held true that the United States is slightly more principled than Ghana and Taiwan. In all other climates there was no significant difference.

INTRODUCTION

Are universities responsible for the ethical behavior of its students beyond their time spent at school? The current literature is answering that question by turning their attention to the individuals held most responsible, faculty at colleges and universities. This paper will examine how ethical work climates impact on the current issue concerning academic elites and their influence on students who will become tomorrow's leaders in the business world. We also look at whether there is any difference between national culture and ethics by conducting a cross-cultural study of professors at universities in the United States of America, Ghana, and Taiwan. We chose these three countries since there position around the globe; North America, Africa, and Asia represent distinct cultures, language, and habits, as well as their position in the global economy.

According to a World Bank study (Salmi 2010) the most prevalent unethical practices by faculty in universities around the world is fraud on admission exams, bribery, favoritism, cheating and plagiarism, fake or unearned degrees and falsification of results or theft of ideas in research. Most of the research in this area has been conducted by international organizations and research institutions. Academic elites are hesitant to participate in many studies. It is for that matter that we feel our research will help shed light on an area of ethics that gets little attention.

To assess faculty at universities in the three nations, we chose the Ethical Work Climate developed by Victor and Cullen (1987, 1988) and later revised by Cullen, Victor and Bronson (1993). The ECQ

measures ethical climates at individual and organizational levels of analysis. It is designed to evaluate respondents' perceptions of how the members of an organization typically make decisions concerning various events, practices, and procedures (Victor and Cullen, 1987). The ECQ basically measures the ethical decision-making of members within an organization.

The design of the paper focuses on the literature of the Ethical Work Climate and its theoretical typology. We than show how the Ethical Work Climates relate to National Culture and finally the literature surrounding how the ECQ and national culture impact university teaching. Data was collected from universities in the United States of America, Ghana, and Taiwan and a one way ANOVA was conducted on the ECQ climates followed by an analysis of the results and limitations of the study.

LITERATURE REVIEW

Ethical Work Climates

Ethical values are a set of guiding principles that encourage individuals in an organization to make decisions consistent with one's value system and the value system of the organization. They are expected to be ideally possessed by an employee. The Ethical Work Climate, developed by Bart Victor and John B. Cullen, (1987, 1988) and James W. Bronson (1993) state that organizations are responsible for any ethical or unethical actions that takes place among their employees and likewise can initiate and implement ethical work climates. "Ethical climates are conceptualized as general and pervasive characteristics of organizations; affecting a broad range of decisions" (Victor & Cullen, 1988, p.101). The Ethical Climate Questionnaire is "simply an instrument to tap, through the perceptions of organizational participants, the ethical dimensions of organizational culture" (Victor & Cullen, 1988, p.103). Therefore the participants becomes the 'type of observer' who views different kinds of behavior, whether in decision-making or their compliance in the organization's practices and procedures; "but not evaluating the perceived organizational expectations" (Cullen, Victor, & Bronson, 1993, p.671).

The Ethical Climate covers two dimensions of theoretical typology (Victor & Cullen, 1988); one dimension is ethical criterion, which is used for the organization's decision-making, and the second, locus of analysis, refers to ethical decision-making.

The ethical criterion dimension covers three major classes of ethical theory (Victor & Cullen, 1988); egoism, benevolence, and principle. Labeled as three major classes of a group or organizational concept, they do not follow an individual's perception or behavior. Egoism is defined as "the maximization of self-interest" (VanSandt, 2001, p.18). This means that a person believes in themselves, irrespective of opposed situations from society or opinions of other people to preserve its dignity as an individual. The second dimension is benevolence, where "people tend to be less cognizant of laws and rules and may also be amenable to arguments employing rules or principles" (Victor & Cullen, 1988, p.105). This explains that an argument or discussion with a person who has lesser knowledge or ignorance of the law or rules might be ineffectual. Principle is the last dimension of ethical criterion where "people … tend to be less sensitive to particular effects on others" (Victor & Cullen, 1988, p.105). This kind of situation usually happens when a worker who is honest and loyal becomes the enemy of another when breaking office policies in the work place. The honest and loyal employee takes some action by reporting the other employee to the management without any second thoughts as long as they know that there is a violation of the policy.

Another part of the Ethical Work Climate is the locus of analysis dimension. This dimension represents the different sources of influences and motivation where a person might conceive its own perceptions on ethical or unethical issues. Victor & Cullen (1988) stated that it is a referent group identifying the source of moral reasoning used for applying ethical criteria to organizational decisions or the limits on what is

considered the ethical analyses of organizational decisions" (p.105). Individual, local, and cosmopolitan are the categories that comprises the second dimension. This locus of analysis demonstrates that ethical climate is an organizational concept (Victor & Cullen, 1988).

Locus of individual "is external to the focal organization in the sense that the prevailing normative climate supports a referent for ethical reasoning located within the individual" (Victor & Cullen, 1988, p.106). This locus explains that perceiving a kind of work climate within an organization can depend on how an individual perceives its environment from their own point of view. While individual locus focuses on oneself, the local locus "specifies sources of ethical reasoning within the organization, such as the workgroup" (Victor & Cullen, 1988, p.106). Victor & Cullen (1988) also mentioned that for the local role incumbent, "the important reference group or sources of role definitions and expectations are contained within the social system" (p.106). This explains that within organizations, employees might perceive a positive or negative value depending on the type of group a person belongs. A group, which places a high value on morale, tends to influence an individual to perceive this kind of thinking; likewise the same with workgroups that place a low value on morale.

A level, which specifies organizational sources of ethical reasoning external to the focal organization, such as professional associations or a body of law (Victor & Cullen, 1988), is what is called cosmopolitan. Developed law-based environments use this locus to perceive norms or morale, which are acquired from other sources outside the organization.

Combining the two dimensions, ethical criterion and locus analysis, forms nine different criterions in order to describe the moral reasoning of an employee or individual.

The locus of the individual when combined with ethical criterions results in the following dimensions: egoism-individual (EI) results in self-interest, benevolence-individual (BI) resulting in friendship, and principle-individual (PI) results in personal morality. Local locus, combined with the ethical criterions creates: egoism-local (EL) resulting in company profits, benevolence-local (BL) resulting in team interest and principle-local (PL) explains a referent to company rules and procedures. For the last three sets of dimensions, the analytical combination of ethical criterion and locus of analysis, the following are described: egoism-cosmopolitan (EC) forms the dimension of efficiency while benevolence-cosmopolitan (BC) and principle-cosmopolitan (PC) form the dimensions of social responsibility and laws and professional codes respectively.

National Culture and Organizational Culture

Studies have shown that organizational cultures are affected by national cultures regardless of the presence of significant subcultures within a nation (Soeters et. al., 1988; Hofstede et. al., 1990). Parboteeah et. al. (2005) also explains the usefulness of the concept of national culture to distinguish work practices (Hofstede, 2001). These work practices summed up as an organization's culture – "a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration" (Schein, 1992, p.12) – have a direct link to the national culture of the individuals who make up the company's workforce (Joiner, 2001; Dusan, 2003). Employees are influenced by various institutions present in their culture before they even join a given organization, such as family, society, religious orders, educational systems, and many other in which they participate have been shaping their beliefs, habits, and identities for years and it is not surprising that employees bring these external influences with them they join an organization. A similar view is echoed by Erakovich and others (2002) who pointed out those cultural influences have the power to change the character and identity of an organization, altering the perceptions and behavior of organizational members.

Research (Crisitie et. al., 2003) has also shown that more than thirty empirical cross-cultural studies on ethical attitudes and ethical behavior have been conducted and practically all of them recognize the influence of national culture on one's ethical attitude and behavior. This demonstrates how national culture plays a significant role on the ethical reasoning and the ethical attitudes of persons, including those in the teaching profession. Hence, we can assume that "if organizational cultures are influenced by national cultures, one can also expect that national cultures will have a significant impact on ethical climates." (Parboteeah et. al., 2005, p.462)

National Culture, Ethical Work Climates and Business College Faculty

Ethical issues associated with the teaching profession have not been given significant attention regardless of many moral and ethical issues being constantly dealt with in university teaching. One of the reasons for this negligence is that even though several researches (De Russy, 2003; Sergiovanni, 1992; Braxton & Bayer, 1999; Markie, 1994) have over the years emphasized the importance of the teaching profession and the power teachers have to create a long lasting impact on their students, "college teaching is not recognized as a distinct profession" (Markie, 1994, p.155). College faculty have been referred to as "gatekeepers of knowledge" (Gaikward, 2011, p.22) who have a significant influence on the quality of life their students are going to have once they are on their own. In *A Professor's Duties: Ethical Issues in Professional Teaching* (1994), Markie tackles various ethical issues in college teaching by partly focusing on the obligations of individual professors, primarily with regard to issues about what and how to teach. Markie asserts that the role of college teachers is a complex one which comes with considerable power and authority, the exercise of which can have significant effect on the lives of students. This 'power and authority' can either be used to better or destroy inadvertently the lives of students shown in the irresponsible and unethical behavior within the professoriate. These include, among other, "lateness for class, use of vulgarity in scholarly forums, showing favoritism among students, improper use of campus funds, plagiarism, and sexual liaisons with students, failure to properly perform administrative duties and unwilling to uphold the value of truth in teaching and research" (De Russy, 2003, p.B20).

To analyze the major distinguishing characteristics of Ghanaian, USA, and Taiwanese national cultures that impact the perceived ethical climate by faculty in Business Colleges, this study focused on the three ethical climates; egoism – maximizing one's own self-interest, benevolence – maximizing the joint interest of an organizational community, and principle – loyalty to universal values and beliefs.

Faculty members in an egoistic climate, more associated with individualism, will more than likely opt for actions that are motivated by personal gains and are beneficial to their career in an academic institution. Given the direct link established between the corporate scandals that have plagued the business world and the responsibility of institutions of higher education to nurture and produce 'ethically-sound' graduates, it is highly relevant to study differences in egoistic climates for faculty in Business Colleges.

Benevolence grounded in collectivism is primarily based on concern for others (Victor & Cullen, 1987; 1988). An organization characterized by a benevolent climate will find faculty identify and solve ethical problems where the well-being of others takes precedent. Parboteeah et. al. (2005) also notes that decisions are aimed to coincide with socially responsible behavior.

In a principled or rule-based climate, ethical decisions are made on the interpretation of rules, laws, and standards (Victor & Cullen, 1998). In an educational institution with a principled climate, fraternization policies prohibiting romantic, sexual, and exploitative relationships between college employees and students will be observed to the letter. The academic institutional rules and professional code of conduct will guide faculty in ethical decision-making.

METHODOLOGY

This research was undertaken to examine whether there are any differences in the ethical attitudes of faculty members in Ghana, Taiwan, and the USA and whether the national culture dimensions of individualism/collectivism (Hofstede 2001) and universalism/particularism (Trompenaar 1994, House et.al. 2004) influenced those differences.

The Ethical Climate Questionnaire developed by John Cullen and Bart Victor (1987, 1988) and further perfected with James W. Bronson (1993) was used. The questionnaire is composed of a 36-item Likert scale representing the nine dimensional values of ethical climate. Minor linguistic changes were made to fit an educational institution. In place of the word 'company', institution was replaced. 'Customer' and 'public', which appeared in items 26, 30, and 34, were substituted with student and stakeholder. These linguistic changes did not alter the meaning of the questions, rather brought the questionnaire in line with terminology best understood within an academic sector setting.

The questionnaire was translated into Mandarin Chinese for the Taiwanese faculty. The Chinese version was prepared by a bi-lingual professor in Taiwan and translated back into English by a different professor from the Applied English department at Southern Taiwan University of Science and Technology in Taiwan. Pre-tests were conducted for assurance using faculty in Taiwan from engineering, health sciences, and linguistics and foreign languages departments.

Data was collected from Business faculty in the USA, Ghana, and Taiwan. Twenty-one American professors from three different states in the United States responded. One hundred Ghanaian professors from Accra and Kumasi and sixty-five professors from public and private universities in Taiwan took part in the study for a total of one hundred eight-six respondents.

Research Hypothesis

Literature supports the fact that individualism seems to be the most relevant cultural factor for differences in the existence and development of the egoistic climate. We can therefore assume that institutions of higher education, notably Business Colleges in individualist societies such as the US are more likely to exhibit egoistic ethical climate. Hence, we hypothesize the following:

Hypothesis 1a: Faculty members in the US have stronger egoistic ethical climates than do their Ghanaian counterparts.

Hypothesis 1b: Faculty members in the US have stronger egoistic ethical climates than do their Taiwanese counterparts.

The benevolent ethical climate discussed above is relevant because it shows how individuals in collectivist societies show care and value for the in-group or institution. We have seen that Ghanaian and Taiwanese are deeply rooted in collectivist ideals unlike in American societies where personal gain takes predominance over communal benefits. Hence, it is more likely that the Ghanaian and Taiwanese will develop benevolent ethical climates to reflect societal norms. The foregoing leads to the following hypothesis:

Hypothesis 2a: Ghanaian faculty members have stronger benevolent ethical climates than do US faculty members.
Hypothesis 2b: Taiwanese faculty members have stronger benevolent ethical climates than do US faculty members.

To the extent that the US is a universalistic society while African and Asian societies like Ghana and Taiwan are more particularistic (Trompenaars, 1994), the following hypothesis is posited:

Hypothesis 3a: US faculty members have stronger principled ethical climates than their Ghanaian counterparts.

Hypothesis 3b: US faculty members have stronger principled ethical climates than their Taiwanese counterparts.

We can assume that the teaching profession all over the world involves the transfer of knowledge and information regardless of the language and the teaching method used or the country in which the profession is carried out. As such, all faculty members irrespective of nationality can be prone to ethical mishaps in their profession in one form or the other.

Therefore, Alternative/Null Hypothesis: There are no ethical climate differences among Ghanaian, Taiwanese and US faculty members.

RESULTS AND ANALYSIS

The Expectation Maximization Algorithm, which is an iterative method for finding maximum likelihood or maximum a posteriori (MAP) estimates of parameters in statistical models, was used to replace all missing data in the questionnaires. This was necessary in order to conduct a confirmatory factor analysis. Four factor, Egoism-individual-Self-interest climate (EI), Benevolence-Cosmopolitan climate (BC), Benevolence-Local climate (BL), and Principle-Cosmopolitan climate are extracted and analyzed.

A one way ANOVA was conducted on the ECQ climates presented below. Based on Table 1 the ANOVA results, for the Self-Interest (EI) climate type, there is a difference between the three mean squares resulting in a significant difference in the egoistic ethical climate perceived by faculty members in the three countries ($F = 14.050$; p-value $= 0.000 < 0.05$). However, the expected results were inconsistent with expectations as the US has the lowest mean, followed by Ghana and Taiwan. Thus hypothesis 1a and 1b were rejected.

Furthermore, the results of Table 1 indicates that there are no significant differences in BC, BL and PC climate types among the three countries studied. Thus, hypotheses 2a, 2b, 3a and 3b were rejected.

Taiwanese faculty perceived stronger egoistic-individual climates than their Ghanaian and US counterparts. Furthermore, the US which was hypothesized to perceive the strongest egoistic-individual climate turned out to perceive the lowest.

Hypotheses 2a and 2b stated that Ghanaian and Taiwanese faculty members have stronger benevolent ethical climates than do US faculty members. These two hypotheses were rejected for both types of benevolent ethical climate (i.e., individual and local). Table 2 shows that the mean results for the three countries were also very similar with non-significant differences.

Hypotheses 3a and 3b stated that US faculty members have stronger principled ethical climates than their Ghanaian and Taiwanese counterparts. These hypotheses were also rejected however the ANOVA results indicate a slightly higher mean for the US which is consistent with our hypothesis.

Table 1: ANOVA for ECQ Factors

		Sum of Squares	df	Mean Square	F	Sig.
EI	Between Groups	26.726	2	13.363	14.050	**0.000
	Within Groups	174.05	183	0.951		
	Total	200.77	185			
BC	Between Groups	2.197	2	1.099	1.586	0.208
	Within Groups	126.78	183	0.693		
	Total	128.98	185			
BL	Between Groups	1.444	2	0.722	0.948	0.389
	Within Groups	139.35	183	0.761		
	Total	140.79	185			
PC	Between Groups	0.836	2	0.418	0.594	0.553
	Within Groups	128.73	183	0.703		
	Total	129.56	185			

*Note: ** 95% confidence level. This table shows ANOVA analysis for the four factors. The result shows that there is a difference between the three mean squares resulting in a significant difference in the egoistic ethical (EI) climate perceived by faculty members in the three countries (F = 14.050; p-value = 0.000 < 0.05).*

Table 2: Descriptive Statistics for ECQ Factors

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
EI	Ghana	100	2.8633	1.0316	0.10316	2.6586	3.0680
	Taiwan	65	3.4051	0.9081	0.1126	3.1801	3.6301
	US	21	2.1746	0.8921	0.1947	1.7685	2.5807
	Total	186	2.9749	1.0418	0.0764	2.8242	3.1256
BC	Ghana	100	3.4675	0.9036	0.0904	3.2882	3.6468
	Taiwan	65	3.2769	0.6748	0.0837	3.1097	3.4441
	US	21	3.5952	0.9168	0.2001	3.1779	4.0125
	Total	186	3.4153	0.8350	0.0612	3.2945	3.5361
BL	Ghana	100	3.0550	0.9021	0.09021	2.8760	3.2340
	Taiwan	65	2.9154	0.7797	0.09671	2.7222	3.1086
	US	21	3.1905	0.9966	0.21747	2.7368	3.6441
	Total	186	3.0215	0.8724	0.06396	2.8953	3.1477
PC	Ghana	100	3.6325	0.8801	0.0880	3.4579	3.8071
	Taiwan	65	3.7038	0.8231	0.1021	3.4999	3.9078
	US	21	3.8452	0.6590	0.1438	3.5453	4.1452
	Total	186	3.6815	0.8369	0.0614	3.5604	3.8025

Note: this table shows the Descriptive Statistics for ECQ Factors among Chana, Taiwan, and USA College of Business faculty.

CONCLUSION AND LIMITATIONS

Our goal was to examine whether business school faculty across cultures would provide insight into whether they were influenced by their organizational culture or national culture when making ethical decisions that would impact on their students.

The data collected from universities in the United States, Ghana, and Taiwan was analyzed using SPSS. A one way ANOVA was performed with surprising results. The results did show that ethical behavior is influenced by both ethical climates (organizational culture) and national culture, although the results were not as expected.

An unexpected result for the United States concerned the egoistic-individual climate. The United States scored the lowest. As a strong individual culture, the expected result should have been the opposite. Those in egoistic climate, more associated with individualism, opt for actions that are motivated by personal gains and are beneficial to their career in an academic institution.

This result may be due to the diversity in faculty that is encouraged in American universities. Another reason for this score may concern the faculty handbook. Frostburg State University issues a handbook with over 200 pages detailing what is considered acceptable behavior and what the institution considers unacceptable, unethical and punishable by law.

Traditionally, Taiwan and Ghana should have demonstrated a closer affinity for benevolence than the United States. The benevolent ethical climate associated with collectivist societies show care and value for the in-group or institution. A possible explanation for the shift away from a strong score in benevolence is the steady economic growth supported by a stable democracy and social stability demonstrated by both countries over the past years. Although the score were similar for principle climates, the United States did show a slight difference. This may be attributed to a climate that emphasizes compliance to rules and regulations irrespective of status or rank. Furthermore, in institutions of higher education faculty misconduct such as favoritism, mishandling of funds and teacher student relationship are not taken lightly. Wrongdoings committed several years back are punished when brought to light regardless of how long ago they took place. This is consistent with findings of universalistic cultures where people place a high importance on laws, rules, and obligations and where the rule is the rule without any exceptions.

Limitations of the Study and Future Study

The small number of respondents from the United States may have skewed the results. Many respondents were also reluctant to participate. There is always the risk when participants are asked ethical questions that the respondents may attempt to answer the questions as they deem to be socially or culturally acceptable. This then makes the answers biased with the potential to distort the results.

To conclude more accurate finding and expand the study for future research the study should be replicated using other countries around the world to determine if there are significant differences among them where ethical climate is concerned. Another important implication of this study is to encourage faculty to emphasize more on ethics while teaching. Research has proven that the more ethical faculty members are the more positive outcomes for students (Hagedorn, 2000). This may provide further incentive for leadership within Business Colleges to work to foster a more benevolent and/or principled Ethical Climate.

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THE EFFECTIVENESS OF MOBILE BASED LEARNING TECHNOLOGY VERSUS FACE-TO-FACE LEARNING OF ACCOUNTING INFORMATION SYSTEMS

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ABSTRACT

The fast developments of information and communication technology (ICT) today not only have an impact on the world of industry, but also in the world of education. In the world of education, the useage of ICT is expected to improve the performance, especially the performances of students with regard to their academic matters. The need to improve the quality of accounting graduates who have personal skills has long been a concern of accounting education. This study aims, first to provide empirical evidence that mobile learning will improve student performance not only in technical skills but also in personal skills. Second, to prove and test the effectiveness of mobile learning as opposed to face-to-face learning in improving the competence of accountants in accordance with the standards established by the Indonesian Institute of Accountants (IAI) and the national education goals. Method of learning with mobile technology is expected to support the learning process of the present method so as to improve the competence of accountants in terms of technical competency skills, personal skills, business knowledge and extensive expertise. The third objective is to understand the students' motivation in learning. This study is an exploratory research and developed a new mobile learning application of Accounting Information Systems. This study used quasi-experimental research design to test the new application.. Research results of the pre-test and post-test score indicated that mobile based learning technology is more effective than face-to-face learning for additional learning of accounting information systems.

JEL: M49

KEYWORDS: Mobile Learning Applications, Quasi-Experimental Design, Students' Performance

INTRODUCTION

The fast developments of information and communication technology (ICT) today not only have an impact on the world of industry, but also in the world of education (Moore et al., 2011; Behera, 2013; Siragusa et al., 2007). In the world of education, the useage of ICT is expected to improve the performance, especially the performance of students with regard to their academic matters. Basically the development and use of ICT can be grouped into two learning systems, ie the system of e-learning as a form of learning that utilizes electronic devices and digital mediaand mobile learning (m-learning) as a special form of learning that utilize devices and communication technologies such as mobile phone (smart phone). This new concept will influence the educational learning process transformation from conventional education into digital form.

The need to improve the quality of accounting graduates who have personal skills has long been a concern of accounting education. The American Institute of Certified Public Accountants (AICPA) published a framework of core competencies (Core Competency Framework) that must be possessed by students entering the accounting profession, both in the public sector, industry, government, or other service

business, which was also adopted by the Indonesian Institute of Accountants/IAI (AICPA, 2004, 2010; IAI, 2010). The competency framework supports the concept of continuous learning that starts from the academic environment and continuing (life-long) through professional education and experience. Learning accounting requires more than knowledge transfer which include the active role of accounting students in their learning process. Quality of learning is not something that can be given away by educators, but need to be developed by the students through the process of interaction between students, educators and other students. In addition to developing technical knowledge and skills of accounting, accounting education programs must be designed to be able to develop computer competency and information systems, communication, interpersonal, intellectual, critical thinking, problem solving, integrity, and othegeneric (soft) skills (Holcomb and Michaelsen, 1996; Boyce, 1999; Behera, 2013). Accounting education is also expected to develop a level of expertise that can be applied in a variety of contexts, including skills that enable students to understand and criticize accounting information and its role in economic and social, as well as the role of accountants in creating and re-creating the social reality (Hines, 1988). Supporting learning methods such as mobile learning appears to be an ideal solution to improve the quality of accounting graduates.

One of the benefits of mobile learning is the life-long learning as indicate on the Core Competency Framework (from AICPA) which supports the concept of continuous learning that starts from the academic environment and continuing (life-long) through professional education and experience. Therefore, this study aims to provide empirical evidence that the approach to learning with mobile learning will improve student performance not only in technical skills but also in personal skills. In addition, by adopting mobile learning technology in accounting education, accounting students not only understand the importance of personal skills in the accounting profession, but they also learn to accept and use ICT as part of the accounting profession. In other words, mobile learning that support conventional learning will drive the achievement of the overall competence of accountants: the technical competence, personal competence and a broad business perspective competency.

This research also aims to prove and test the effectiveness of mobile learning as opposed to face-to-face learning in improving the competence of accountants in accordance with the standard established by the Indonesian Institute of Accountants (IAI) and the national education goals. Method of learning with mobile technology is expected to support the learning process of the present method so as to improve the competence of accountants in terms of technical competency skills, personal skills, business knowledge and extensive expertise. Important issue in accounting education is how to have a qualified accounting graduates competencies in line with the expectations and the needs of the community. Indonesian Institute of Accountants (IAI) has adopted the core competencies of accountants based Core Competency Framework issued by the AICPA.

IAI also stated that although the curriculum/syllabus of undergraduate accounting education and Accountants Professional Education (PPA) in terms of skills, values, ethics and professional attitude is subjected to International Education Standard (IES) no. 3 - professionals' contents and skills, no. 4 - professional values, ethics, and attitudes, but still need to balance the percentage of the knowledge, skills, values, ethics and professional attitude, and assessment of methods and techniques of teaching (IAI, 2010). This study is important for several reasons: first, this study tried to carry out a review of the methods and techniques of teaching by providing a solution that is more sophisticated learning methods in accordance with the advancement of technology, the mobile technology-based learning methods. Second, although mobile technology has developed very rapidly, up to date positive impact of mobile learning is still questionable, considering there are positive and negative impacts of the emerging mobile technologies. Finally, the application of mobile learning in accounting education and its impact to date, to the author's knowledge has not been done. The rest of this paper will be organized as follows: the second section of this paper is the literature review. The third section outlines the research methods and the forth section describes research results. Finally, conclusion is set in the last section.

LITERATURE REVIEW

Theories in Mobile-Learning

Integration of technology based learning like M-Learning in the learning process is supported by several theories.The first theory is socio-constructivist theory. Swan (2005) indicated that socio-constructivist theory basically constructed from cognitive-constructivist teory and sosial-cognitive theory. Constructivists believe that reality is constructed by the human mind when interacting with the world where we live physically, socially, and mentally. We try to understand the experience by constructing and adjusting the internal structure of knowledge that is collected and organized in our mind as a perception and is reflected in the reality. Socio-constructivist learning theory suggests that learning in the minds of individuals and is an active process of forming mental interacts with the environment or emerging from social interaction (Duffy and Jonassen, 1992). Learning is essentially a social activity, and that reality is constructed through communication, collaborative activities and interactions with others. This indicates that students naturally organize and construct their knowledge and computer technology is a media that support the interaction process. Thus, constructivists believe that the computer has a unique capacity to represent abstract ideas into more concrete form.

From the point of view of constructivist, learning becomes more individualized and increased knowledge of individuals will center on the learner (learner-centered). Therefore, the individual will interact with other individuals (collaborative) and perform continuous learning (life-long), so that the technology can be used as a means of learning the (Swan 2005). The second theory is situated learning theorywhich suggested that learning must be conducted in the context of actual environment. Digital learning technology can be used not only to represent the contexts but also learning content (Brown et al., 1989). Theorists of learning-situations (situated learning), argues that learning is a function of activity, context and culture in which the learning takes place, so it can not be separated from the support of community participation. The important concept in this theory is the existence of a statement of legitimacy surrounding them. That is, proficiency in the knowledge and skills can be achieved gradually by the plunge in a community of practice. In the context of education, students (cognitive apprenticeship) in the class working on a problem with the help of a friend or someone more expert, like the professor or instructor (knowledge building communities), where students collaborate and learn from the self and community environment gradually (Swan, 2005).

The third theory is Authentic Learning Theory. This theory stated that stated that the development of multimedia technology capabilities able to deliver learning products that facilitate communication and division (sharing) of knowledge so that learners can use it to reflect and construct further knowledge (Herrington dan Oliver, 2000). In developing learning environments in higher education, the constructs used in authenthic situated learning theory is derived from learning theory, which can be defined as the context of task and role of participants (users). Task context is created by making a realistic and authentic problem. Realistic and authentic problems are generally complex and difficult to be defined so that depth analysis from various perspectives, collaboration and reflection of participants are needed (Herrington dan Oliver, 2000). Such characteristics exist in ICT including mobile technology. This means that ICT with mobile technologies can be used to leran by creating problems that occur in the real world (realistic and authentic world). Based on these theories, the learning can be done with ICT-based learning media. ICT-based learning can be grouped into two learning systems, namely the e-learning as a form of learning that utilize electronic devices and digital media systems, and mobile learning (m-learning) as a special form of learning that utilize devices and mobile communications technology. These two concepts of learning bring the transformation process from conventional education into digital form, both in content and system.

Mobile-Learning Development

The education system has been and until now mostly done by traditional face-to-face between educators and students in one classroom. The development of ICT has an important role in changing education method. Teaching and learning processes which was originally dominated by the role of the teacher - the area of teacher, and then the process started much dominated by the role of the teacher and books - the area of teacher and book. Furthermore, this role began to shift with the dominant role of teachers, books, and technology – thearea of teacher, books, and technology (Soekartawi, 2003; Haythronthwaite et al., 2011; Behera, 2013). Thus there is a shift in learning paradigm from conventional learning to sophisticated learning with digital technologies such as mobile learning. Research by Motiwalla (2007) using experiment study of wireless learning proved that wireless technology can be adopted in learning process. In the world there are more than 5 billion people who bring a very powerful tool in their pocket or bag that is mobile device. Of these people, 500 million people use the internet in 2009. The amount will be doubled within five years in which mobile technology replaces the Personal Computer (PC) as a means to get into the web (Cumavo, 2011). In Indonesia alone, there are 68 million mobile users at the end of 2006, 94.7 million in 2007, and this number will increase to 133 million by 2010. In other words, nearly half the Indonesian population (about 250 million people) will be mobile users (Bahar, 2009).

Indonesia is the world's three biggest users after China and India. Guild Research results regarding the adoption of mobile learning in the organization showed that in the world of education 14.5% had used mobile learning, 10.3% started to build a business case based mobile learning, 47.6% began researching how other organizations use mobile learning, and 22 , 1% do not have any plans with mobile learning. Based on these data, although there was an extraordinary development in mobile learning, but research on mobile learning in accounting education in Indonesia is scarce or even not yet done. Research on learning using information and communication technology (ICT) has been conducted by researchers whose focus is on learning or electronic learning methods are more commonly known as e-learning (Suryaningrum et al., 2009). The research results prove that despite the ease of use of e-learning, but until now the use of e-learning in accounting education in Indonesia is not developed as expected.

In accordance with the development of ICT, learning models shift towards the use of mobile technology that can be accessed anywhere and anytime. Ramli (2011), a senior adviser at the Ministry of Communication and Information of the Republic of Indonesia, said that based on market research in 2010 in the Indonesian cellular telecommunications penetration (full mobility) of 84.5% (± 203 million), much larger than the penetration of fixed wireless (limited mobility) which only amounted to 13.3% (± 8.3 million), and the remaining 9.3% for fixed wirelines and broadband penetration. Ramli further revealed that in the field of education, the government plans to networking with relation (link) to 40 million students. The factors driving the expanding opportunities of the use or application of mobile learning as a new trend in the study are the level of development of mobile devices is very high, the level of use is relatively easy, and the price of the device is more affordable around $ 100, compared to personal computers around $ 500 (Ramli, 2011). This has formed a new learning paradigm that can be done anywhere (where ever) and anytime (when ever).

Historically, electronic learning objects, were designed anddeveloped specifically for playback on unique devices, e.g. videotapes, cassette tapes,CDs, television, personal computers, etc. Accessing courseware specifically developed for these electronic devices resulted in a tethered learning approach, restricting the ability of mobile students to take courses. M-Learning, as a subset of D- and E-Learning, wasdesigned to overcome such limitations(Idrus and Ismail, 2010; Moore et al., 2011). M-Learning 1) provides the ability to create homogenous learning objects for heterogeneous mobile devices, and 2) does so by utilizing wireless connectivity.This approach benefits a growing audience of post-secondary institution and workforce learners, e.g. those in hard to reach, isolated locations, away from their home or office, or in FTF environments where a need to augment the classroom experience exists. The advent of M-Learning created

an environment of anywhere, anytime learning (Keegan, 2005; Low and O'Connell, 2007; Moore et al., 2011). Chocrane (2011) indicated that M-Learning bridges pedagogically designed learning contexts, enables learner generated contexts, and content, while providing personalization and ubiquitous social connectedness.This M-Learning practice was adopted by universities and firms that wished to reach a diverse audience of learners– many of whom were mobile with restricted access to the devices that traditionally made D- and E-Learning possible.

DATA AND METHODOLOGY

To find out how important the material content in the curriculum/syllabus is taught to accounting students, a preliminary interviews were conducted with several professors and students of accounting at the Universitas Pembangunan Nasional"Veteran" jawaTimur, particularly on the learning materials of Accounting Information Systems (AIS). Preliminary results of this interview suggest that learning AIS especially with regard to capabilities in the areas of technology and information systems are still very weak. There are two reasons why it happened. First, accounting educators are to focus on the material that will improve practice skill competency (or technical skills) with the hope of accounting graduates to be an expert accountant in applying accounting practices. Second is the limited time in learning with face-to-face teaching methods in the classroom. In accordance with the system of semester credit, accounting courses, which generally have 3 credits given face-to-face teaching time in the classroom (face-to-face) about 2.5 hours (50 minutes x 3 credits = 150 minutes). Face-to-face time in the classroom is generally focused on learning technical skills that do not allow providing or discussing matters relating to ethics, behavior, or technology as learning to improve personal skills.Supporting learning methods such as mobile learning appears to be an ideal solution to solve that problem.

This study is an exploratory research program to develop a mobile learning application of Accounting Information Systems (AIS). Once the AIS mobile learning application is completed, tests on the application made by using the quasi-experimental research design. There are two things that will be measured: 1) student learning outcomes in the domain of knowledge (cognitive) knowledge of AIS. Knowledge was measured using MCQs (Multiple Choice Question) conducted in pre-test and post-test. 2) Students' attitudes and motivation were measured after students attend one lecture or teaching methods by using a mobile learning. MSLQ (Motivated Strategies for Learning Questionnaire) developed by the National Center for Research University of Michigan to improve postsecondary teaching and learning (Pintrich et al., 1991; Garcia and Pintrich, 1995; Duncan and McKeachie, 2005) is used in this research.

Research subjects are fifty two students of the Faculty of Economics majoring in Accounting who has passed the AIS courses. Students are grouped into two randomized groups. Each group will follow the learning process of AIS with a certain topic of data warehaousing with different methods: 1) face-to-face classes are held at the Laboratory of accounting and 2) mobile learning that can be done by students anytime and anywhere. Respondent responses are 100% and all 52 datas can be used for further examination. The quasi-experiment was started in February 2014 (pre-test) and finished in May 2014 (post-test). The pilot study of mobile technology-based learning applications is done at the user level (accounting student who has completed an AIS course). Design research is quasi-experimental control group pre-test and post-test non-equivalent (non-equivalent pre-test and post-test control group design) testing pre-post test, attitude assessment, and student motivation to use mobile learning.a). Pre-post test was conducted to measure the impact of behavioral changes in students after the students utilize mobile learning application program with their cell phone. Pre-test conducted before students take advantage of mobile learning applications program, which aims to measure the ability of students before the beginning of the use of technology-based learning mobile applications. Post-test was performed after an application program utilizein the student learning. Students were given for 6 days to try and take advantage of learning applications. Test post-test is intended to measure the ability of students after using the mobile technology-based learning application. b).

Assessment of attitude and motivation of accounting students is done to seek information from students after the students get a chance to try and make use of mobile technology-based learning application.

RESEARCH RESULTS

Numbers of students who are willing to follow the pre-test are as many as 52 students.Pre-test questions are multiple choice questions with topic of data warehouse that consists of 20 questions randomly selected from the 30 available questions. In the pre-test, the students were grouped into 4 grupto distinguish given multiple choice questions. This is done so that each student can not imitate each other answers. The average pre-test score of students is 53.94 or 54 (fifty-four). The pre-test scores will then be compared with the post-test scores, the value after the student got to the topic of AIS data warehouse learning. Comparison of pre-test and post-test was conducted using paired sample t-test. At the post-test activities, students were also asked to complete a questionnaire about the attitude and motivation of the use of mobile technology in learning. Data tabulation and analysis was conducted in May 2014. Data qualified test was conducted to prove that the instruments and datas are suitable for further analysis. The reliability test showed alpha of 0.88 more than 0.60 which indicated that the data was reliable. Validity test Ujishowed that Kaiser-Meyer-Olkin Measure of Sampling Adequate (KMO-MSA) score was 65.3% more than 50% which indicated that the data was valid for further analysis.The analysis was conducted to provide: 1) whether the additional learning using mobile learning is effective in improving students' knowledge and ability and 2) whether there is motivation difference in learning using mobile-learning between the two groups of mobile-learning (ML) and face-to-face (FTF).

Table 1: Normality Test

No	Item	Sig.	Conclusion
1	Pre-test Score	0,229*	Normal
2	Post-test Score	0,200*	Normal
3	Learning Motivasion	0,987*	Normal

*Significance at the 5 percent *This table showsthe result of normality data test. The significance values show more that 0.05 which indicates that all data are normal.*

Table 2: Pre-Test and Post-Test Comparison of AIS Score

Group	N	AIS Score (Average)	
		Pre-Test Score	Post-Test
Face-to-Face (FTF)	26	51.54	55.65
Mobile-Learning (ML)	26	56.35	71.73
Total (average)	52	53.94	63.69

This table shows on average the AIS score before (pre-test) and after (post-test) the additional learning both of face-to-face and mobile learning

Comparison of Accounting Information System (AIS) score before and after the additional learning in Table 2. Table 2 showed that on average SIA score for both group are increased. The average AIS score for FTF group increase from 51.54 to 55.65 while ML group increase from 56.35 to 71.73.

Table 3: Paired T-Test on AIS Score

Group	Mean	Std.Dev	Std.Error	T	Df	Sig.
FTF	4.115	3,374	0,662	6,219	25	0.000*
ML	15.385	11,363	2,229	6,903	25	0,000*
Total	9.750	10,062	1,395	6,987	25	0,000*

*Significance at the 5 percent *This table showsthe result of paired t-test on AIS score after additional learning. The significance values show less than 0.05 which indicates that there is difference between students who received additional learning with face-to-face to students with mobile leraning.*

On total, the AIS score increase from 53.94 to 63.69. Paired t-test was used to examine whether these scores are significantly different as shown in table 3.

The results using paired t-test proved that there are significant differences between students who received learning materials of accounting information systems with face-to-face classes and mobile learning. Learning with mobile learning indicated the average change in the value of knowledge at 15.385, while the face-to-face learning of only 4.115. This implies that additional learning with mobile learning is more effective than the face-to-face learning.

Table 4: One-Way Anova Post-Test Score Dependent Variable: Post-Test Score

Item	Sum of Square	Df	Mean Square	F	Sig.
Between Group	3360.077	1	3360.077	30.530	0.000*
Within Group	5503.000	50	110.060		
Total	8863.077	51			

*Significance at the 5 percent *This table shows the result of one-way ANOVA on post-test score. The significance values show less than 0.05 which indicates that there is difference between students who received additional learning with face-to-face to students with mobile leraning.*

Testing with one-way ANOVA (Table 4) shows the F value of 30.530 with significance value of 0.000. The significance value less than 0.05 so it can be concluded that the post-test score between groups (face-to-face and mobile learning group) are significantly different. It is proved that additional learning materials using mobile learning is more effective than face-to-face learning. Therefore, the material of AIS that could not be thought in face-to-face classroom activities can be added using mobile learning.

Table 5: One-Way ANOVA of Learning Motivation Dependent Variable: Learning Motivation

Item	Sum of Square	Df	Mean Square	F	Sig.
Between Group	0.050	1	0.050	0.165	0.686*
Within Group	15.109	50	0.302		
Total	15.159	51			

*Not-Significance at the 5, 10, 25 percent *This table shows the result of one-way ANOVA on learning motivation. The significance value showsmore than 0.05 which indicates that there is no difference of learning motivation between students who received additional learning with face-to-face to students with mobile leraning.*

Testing with one-way ANOVA (Table 5) shows the F value of 0.165 with significance value of 0.686. This value is greater than 0.05 so it can be concluded that the learning motivation between groups (face-to-face and mobile learning group) did not differ significantly. This proves that students are motivated to learn similarly despite different method in learning materials. Because of the same motivation to learn, it is suggested that the learning material is added with mobile learning if it is not enough time to explain all of the material in the syllabus on face-to-face classroom activities.

CONCLUSION

This study aims to provide empirical evidence that mobile learning will improve student performance and to prove and test the effectiveness of mobile learning as opposed to face-to-face learning and to understand the students' motivation in learning. This study is an exploratory research and developed a new mobile learning application of Accounting Information Systems. This study used quasi-experimental research design to test the new application. The test results prove that the additional learning with mobile learning is more effective than face-to-face learning. The advantage of mobile learning is no limitation of space and time, making students can learn anywhere and anytime as required. At least four limitations should be noted in this study. First, this study using experiemental design that focused more in internal validity than external

validity. Second, students' performance may be different since individual participant provided the empirical data, possible biases or preferences (e.g. learning styles, students' GPA, social preferences, etc) may exist due to different personal experiences, family, or educational background. Third, since this study is an exploratory research, it didn't control for other variables that may influence the students' performance. Finally, this study use paired t-test and ANOVA to analyze the different of students' performance and learning motivaton between face-to-face and mobile learning that may have some limitations. Future research may conduct the same study with larger participants to expand the external validity, use a control variable as a moderating variable (such as GPA, learning styles), and use other analysis like two-ways ANOVA or multivariate analysis.

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IBFR

COMPETENCY BASED EDUCATION AND TECHNOLOGY IN TEACHING STATISTICS

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ABSTRACT

This research focuses on proposing answers to crucial questions for improving statistics teaching. There is a perception not yet overcome that statistics is abstract, not useful, rigid, that generates anxiety and negative attitudes especially in management science and socials students. Neumann, Hood and Neumann (2013) provide an overview of recent research on teaching and learning statistics. Makar & Ben-Zvi (2011), Gardfield & Ben-Zvi (2007) and Scheaffer (2001) have suggested teaching approaches that include more real-life data and less theory, more data analysis and intuition-based knowledge building supported on active student participation and suitable technology and software. Research findings on how student learns, competency-based education, teamwork and communications and information technologies provide the platform to device and test new answers. Our study reports results achieved in our university (UANL-FACPyA) from an exploratory research. We share these results with all those statistics teachers and instructors in business and industry organizations facing theses challenges.

JEL: A20

KEYWORDS: Statistics Education Research, Teamwork, Competency-Based Education, Statistics Software

INTRODUCTION

Modern societies need competent employees and citizens that may function properly in our information-laden organizations. One critical skill that competent citizens (and future competent citizen, i.e., students) should achieve is statistical literacy. In regard with this concept, statistical literacy is the ability to understand and think critically about data, statistical methods, and results interpretation as *basic skills* or minimal knowledge achieved by all citizens. These skills also include desired habits of mind, attitudes and general awareness, since data variation and chance are omnipresent in modern life (Gal, 2004).

We should expand the statistical literacy concept to include the ability to understand and critically evaluate findings from recent research discussed in newspapers, magazines and journals that can make a substantive difference in personal, professional and policy-making decisions, and in quality of life (Wallman, 2003). Watson (1997) detailed what statistical literacy should include: 1) a basic understanding of probabilistic and statistical terminology; 2) an understanding of statistical language and concepts when they are embedded in the context of wider social discussion; and 3) a questioning attitude one can assume when applying concepts to contradict claims made without proper statistical foundation. A more advanced set of statistical knowledge and skills beyond basic literacy may and should be achieved by some people such as college and graduate students, and even technicians or incumbents of certain industries job, such as manufacturing.

There is a perception not yet overcome that statistics is abstract, not useful, rigid, that generates anxiety and negative attitudes especially in management science and socials students (Neumann, Hood and Neumann, 2013). The issue that we want to introduce here is that even though statistical education is being promoted at all levels at a fast pace, research supporting these efforts has evolved at a much slower rate. Researchers in this area have posed crucial questions. They invite us to propose answers.

Although US government educational agencies since year 2000 recommend that education from kindergarden through grade 12 should include statistical reasoning, educational research on this area is not substantial and well supported. Evidence research tells us since the 1980´s that many adults cannot handle questions related with probabilistic thinking properly. Neumann, Hood and Neumann (2013) provide an overview of recent research on teaching and learning statistics. Makar & Ben-Zvi (2011), Gardfield & Ben-Zvi (2007) and Scheaffer (2001) have suggested teaching approaches that include more real-life data and less theory, more data analysis and intuition-based knowledge building supported on active student participation and suitable technology and software. What we want to add to the existing body of literature is the validation of the hypothesis that competency-based education supported by technology could improve substantially statistics learning. Our exploratory in-class research focuses on proposing answers to overcome these crucial perceptions and questions when teaching statistics.

The remainder of the document is organized as follows: First, we do a literature review to summarize previous studies related with crucial questions in reference with challenges when teaching Statistics and efforts to face them. Second, we present the methodology based on a conceptual model that we are using to understand and validate the impact of attitude, efforts and other factors in course outcomes, and data we have collected from a 28 students' class experiment, when applying this model and Csikszentmihalyi suggestions to promote positive attitudes. We also present the instruments and statistical methods used to collect and process data and ascertain the impact of efforts in course outcomes. Third, we present the results and findings when applying the methods we have suggested for teaching Statistics, explained in previous section. Fourth, we conclude telling the reader what we have done and achieved that could beneficially add to the existing body of literature.

LITERATURE REVIEW

This section summarizes previous studies related with crucial questions in reference with challenges when teaching Statistics and efforts to face them. In line with recent research on teaching and learning statistics, in a statistics course taught in the first semester of 2014, we promote the use of real-life data, since several researchers have suggested implementation of teaching approaches that include more real-life data and less theory (Gardfield and Ben-Zvi, 2007, Scheaffer, 2001, Makar and Ben-Zvi, 2011, Neumann, Hood, and Neuman, 2013). This course has a competency-based approach and specific details are detailed in Appendix.

Conceptual Model: Factors Impacting Course Outcomes

We show in Figure 1 the model that we are using, derived from our literature review, to understand and improve the teaching statistics process. Data collection and statistical analysis in this exploratory research were a collaborative effort done during class sessions.

Attitude is very important for attaining *outcomes* but we have inserted *effort* as an intermediate variable between them, as seen in Figure 1. Setting goals, or expected outcomes, plus motivation reflected in *efforts*, leads to developing strategies for achievement, i.e., good grades and skills development. These strategies involve the student in the design processes for monitoring progress or problems solutions for achieving those goals. The difference between successful students from unsuccessful students, it is often that successful students set goals, or expected outcomes (Zimmerman, 1989). Csikszentmihalyi (2013, p. 44)

points out that anxiety occurs when the task, or expected outcomes involves a very high challenge, with a very low performer skills, whether the person is a student, a worker, or just any person (See Figure 2).

Figure 1: Conceptual Model of Impact of Attitude, Efforts, and Other Factors in Course Outcomes
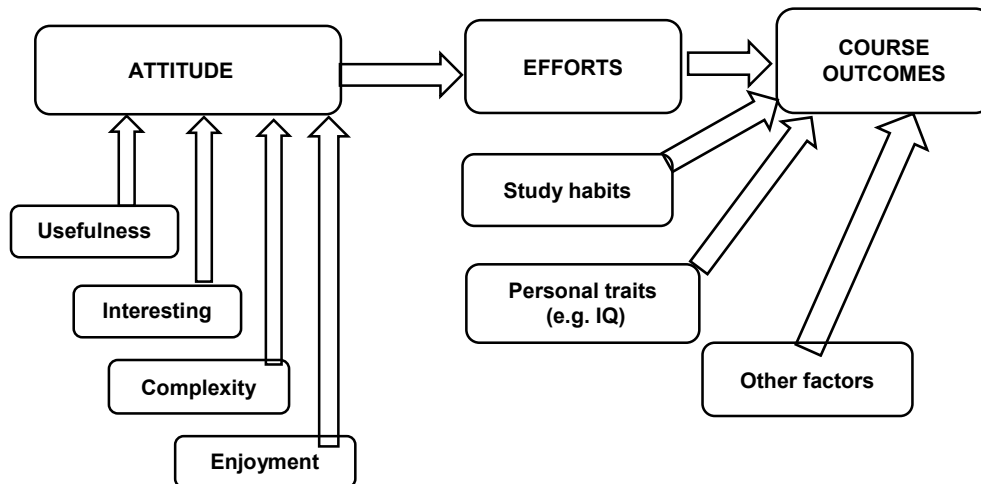
Source: Authors design. This figure shows the relationship of effort and other factors in course outcomes, and the attitude components on effort.

Figure 2: Quality of Experience According to Challenge and Capacity Levels

Source: Authors design- Based on Csikszentmihalyi (1997, p. 31), this figure shows the relationship of Capability level and Challenge level that induce quality experiences in work, study, sports, artistic or other activities. The ideal path when designing learning activities is to prepare capabilities level of students in order to start from relaxation, then to induce a sense of control (self-esteem), and finally increase the challenge level to induce flow.

To avoid anxiety, challenge should increase incrementally, but according to the confidence and capability of the performer, and at the same rate. The flow state begins to be experienced when these two variables, challenge and capability, are above average and keep increasing in a balanced way. The state of maximum flow occurs when these two variables are located in extremely high levels. Regarding the impact of goals on improving students' attention and greater involvement, i.e., efforts, the author of the theory of flow has declared that "when the goals are clear, the feedback relevant, and challenges and skills are balanced, attention becomes focused and full strength" (Csikszentmihalyi, 1997, p. 31).

Desirability of Flow State

The flow state tends to occur when a person's skills are fully involved in overcoming a challenge that he or she may face. Optimal experiences usually involve a delicate balance between the capabilities we have to act and the opportunities available for action (Figure 2). If the challenges are too high, we are frustrated, worried and finally anxious. If the challenges are too low relative to our capabilities or skills, we feel relaxed and then bored. If we perceive challenges and skills have a low level, we are apathetic. Conversely, when we have to face a high level of challenges that involve the application of a high level of skills, we probably have a deep involvement. This is what separates the states of flow from the ordinary experiences. A climber will experience this state of flow when the mountain demands full force and concentration; a singer when the song calls for the full range of her or his vocal abilities; a surgeon, when the operation involves new procedures or require an unexpected variation. These experiences allow flow states that provide flashes of intense living against a matte background. Right and upper zone of Csikszentmihalyi model (Figure 1). A normal day, with no induced flow states, produces boredom and even frustration and anxiety (Csikszentmihalyi, 2013). A person who experiences a state of flow is completely focused, and engaged with extreme psychic energy. His or her mind does not leave any room for distracting thoughts or irrelevant feelings. In this case, self-consciousness disappears (rapture, or ar_rob_amiento in Spanish), but one feels stronger than normal. The sense of time is absent and hours seem like minutes. In extreme state of flow, one feels time is not happening (Csikszentmihalyi, 2013). When the whole being of a person expands into a fully functioning body and mind, anything you do is worthwhile by itself; living becomes its own justification. In this harmonic convergence of physical and mental energy, life finally takes his own sense (Frankl, 2006).

Flow states inducement, in oneself or in people with whom we have contact, is important in diverse areas: 1) In everyday life, because we improve the quality of life and well-being, also called *euphoria*, 2) In education, besides making it more enjoyable or pleasant, flow states impact intensity and duration of the student's attention favorably, 3) In work, it improves the quality of life at work, beneficial psychological states are experienced, and most likely, following the HR model of Hackman and Oldham (1976), flow could also increases job performance, 4) In cultural activities, such as arts, or in leisure and hobbies flow may boost creativity and performance. It shows up when a musician, for example, he/she wonders and enjoys bright performances in such a way as becoming ecstatic or in rapture, or experiencing euphoria.

The orientation towards competency approach, high involvement, meaningful learning and group collaboration, implies that the professor designs a working structure in which students organize and develop their work as part of a team or a group (Fink, 2004). In teamwork literature, a distinction between group and team is done by identified the interdependence of the members of the group with respect to the task. Thus, the greater the interdependence the greater the need for interaction between members, i.e. the closer the interaction, and they will be identified as a team (Fink, 2004, Salas, Rosen, Burke and Goodwin, 2009).

Related to this, the attaining of a common result, i.e., a collective product when pursued by the team is another relevant feature of teamwork. To walk this step from group to team, instructional strategy requires a strong emphasis on the learning and application of concepts, i.e., that the activities of the teams of students engage them in these aspects (Michaelsen and Knight, 2004). For this, the implementation of activities in each topic of the course program should be increasingly oriented from a simple approach to a more complicated level. This promotes learning and allows teams a great cohesion, a situation that can make them more productive for next steps (Birmingham and McCord, 2004). Behind the whole work, on one hand there is a highly meaningful learning experience because team members can provide more volume and/or a great diversity of inputs. On the other hand, this can be achieved as a remarkable development of the group by increasing the interaction between group members (Birmingham and McCord, 2004, Bonals, 2013).

In following this approach, the teaching of statistics, in our case, collaborative and teamwork applies from the basic concepts of learning and data generation, throughout its collection and processing, analysis and interpretation, done by students but coached by the professor. An example is to develop a small survey in class in reference to students opinions about usefulness, complexity, like/dislike, interest on the subject, and personal characteristics of students and environment; and then go through the full experience up to results interpretation, keeping in mind one or more hypotheses. With an increased confidence in this process and a feeling of purpose and quality control, students expand the sample interviewing schoolmates in other statistical classes.

Another example is the team's division of labor and competition when throwing (dropping) a "dart" to a "100" line level marked in green and 80 and 120 in red on a 1millimiter precision graph paper board, because one student drops the dart, a second student reads the result, and a third one registers results and input them at a PC. By the way, the "dart" is made of a pencil with a needle inserted in pencil eraser. Besides that, there is an in-focus projector connected to the PC and Excel applications developed for this purpose so the group can watch right away the normal curve that shows up when the full collection of data are processed and displayed. Then, it is the proper time to explain the normal curve full topic at class, now that they are relaxed, feeling that they have control and ready for higher understanding challenges, i.e., we are moving bottom up in right sides quadrants in Csikszentmihalyi's model (Figure 1). You may see this process via our DropBox link. https://www.dropbox.com/sh/emvwi5dg3mgg1ns/1oy5PScX6-

DATA AND METHODOLOGY

In this section, we explain the methodology, based in our teaching experience and Csikszentmihalyi's ideas, for conceptually define negative perceptions and operational levels found for them, and actions to overcome those negative perceptions about Statistics learning, through competency-based learning, teamwork and use of accessible communication and information technology. We also present the instruments and statistical methods used to collect and process data and ascertain the impact of efforts in course outcomes. The explanation of this is via the following tables. As we can see, in Table 1, we have listed negative perceptions, and we have proposed actions to revert the negativity of them. We include also some examples to do so.

Table 1: Negative Perceptions in Reference to Statistics, and Overcoming Actions and Examples

Perception to Change	Actions to Change Perception	Examples
Statistics is abstract.	Generate and analyze concrete real-life data.	Students measure their body weights, heights and calculate body mass indexes. Visualize used car prices as a function of car millage using an Excel scatter diagram. Each student analyzes a different car.
Statistics is not useful.	Scatter diagram of car prices versus millage from data published in students local area newspaper (www.avisosdeocasion.com)	Students learn how much to pay for a used car, today and in my city.
Statistics generates anxiety.	"Play with darts" and compete in-class teams to get as many 100s as possible. Try to get them close to the 100 mark ; as many as possible.	Generate the corresponding distribution curve for each team using Excel. Calculate and interpret average and variance, and percentage in 100 ± 10 interval. Check how close is each team to a bell-shaped normal distribution curve.
	Throw two dices and register sums resulting by teams.	Compare how close is each team outcome to a triangular distribution.
Other negative attitudes	As needed.	As needed.

This table lists in first column three of the most cited negative students perceptions in literature associated with Statistics learning effort. In second column, we annotate our suggestions to design learning activities to overcome the negativity of each perception, and some examples of those actions in column 3. Each student uploads his own example as learning evidence to DROPBOX and is graded by a professor assistant with a rubric.

In Table 2 and Table 3, we define the meaning of outcomes and efforts, since we will be using regression analysis methods to capture the impact of efforts in outcomes. This, as a first approach to a structural equation model that could be emerging, in the near future, from our conceptual schema depicted in Figure 1.

Table 2: Statistics course outcomes

Outcome Level	Meaning in Survey	Outcome Level Tag for Researchers Only
1	I did not meet my objective. For example, "my objective was to get a 100", or "my objective is just to pass" or "get a good grade" but I did not achieve it.	Very low
2	I got my objective just partially or less than expected. For example, "I got a good grade in concepts but I just passed in problems section".	Low
3	I just met my objective. For example, "I got almost what I was expecting".	High
4	I exceeded my objective. For example, "I got a higher grade than expected".	Very High

This table describes the meaning of each course outcome level, as a semantic scale. This scale is included in questionnaire. The third column shows a short tag for each level code. These tags are not shown to respondents so they may not be induced to read just the meaning of each level, and answer without a careful pondering.

Table 3: Student Efforts in Statistical Course

Effort Level	Meaning in Survey	Effort Level Tag for Researchers Only
1	My effort was minimum or scarce.	Very low
2	I made good effort but I did not take my effort forward when difficulties arose.	Low
3	I worked hard even when difficulties arose.	High
4	I followed all the recommendations made by my professor for a careful exam preparation. I surmounted any difficulty.	Very High

This table describes the meaning of each course effort level, as a semantic scale. This scale is included in questionnaire. The third column shows a short tag for each level code. These tags are not shown to respondents so they may not be induced to read just the meaning of each level, and answer without a careful pondering.

We also should keep in mind that in a real world job as in classroom activities, experiential activities must have the characteristics of sports teams: clear goals, joint tasks, timely feedback and recognition by group members to individual contribution to the achievements. In our case, a statistics teaching class, collaborative and teamwork applies, from data generation through their collection, processing, analysis and interpretation as experiential activities for students. Besides the example mentioned above, another example is to develop surveys in class and go through the experience of collecting information, capture, process, interpret and write results using information and communication software and classroom equipment, keeping in mind one or more hypotheses all the way.

RESULTS

Shown next are the main findings when applying the methods we have suggested for teaching Statistics, explained in previous section. We have used codes from level 1 to 4 for a semantic scale; and in general, code 1 is for very low level, code 2 for low, 3 for high, and 4 for very high level. Results in reference to the usefulness of statistics are that 71% of the group or class said that it is substantial (Code 3) or very useful in her/his life (code 4). Considering the intensity of scale as metric, the hypothesis that *What is being learned is not useful* is rejected with t = 11.09 and p-value = 0.000, reaching the intervals limits between 2.8 and 3.6 at 95% confidence, which confirms the substantial usefulness deemed by students.

Regarding on how interesting or uninteresting is Statistics, as it is being taught, results are favorable to interesting side since 65% think it is considerably interesting (Code 3) and 29% as very interesting (code 4). Only 6% said it was just some interesting or nothing interesting at all. The hypothesis that *Statistics is not interesting* is rejected with t = 16 and p-value = 0.000, reaching the limits between 2.9 and 3.5 at 95% confidence, which confirms the inference that is considerably or high interesting.

In reference to complexity/simplicity, only 18% felt that the approach of the course was complex or very complex. Favoring simplicity 82% declared that it was simple (Code 1) and understandable (Code 2). The hypothesis that *The subject is complex* is rejected with t = 12.5 p-value = 0.000, reaching the limits between 1.5 and 2.2 at 95% confidence.

With respect to enjoyment of statistics as the course is conducted, students said that enjoyment was little, considerably or much, with percentages of 47%, 35% and 18% correspondingly. An important additional factor, which could influence results, is the method of study performed outside the classroom. The opinion that their method was not considerably good at all accounted for 18% of students; 24% of the class said that methods could be improved. Although 58% considered they have a good method anyway it could be better, they said. No student said she/he has a very good method. In reference to the impact of effort on course outcome that we have proposed in the conceptual model on Figure 1, we have found relevant and statistical significant impact as shown in Figure 3. One dot or point represents several cases.

Figure 3: Impact of Effort in Course Outcome
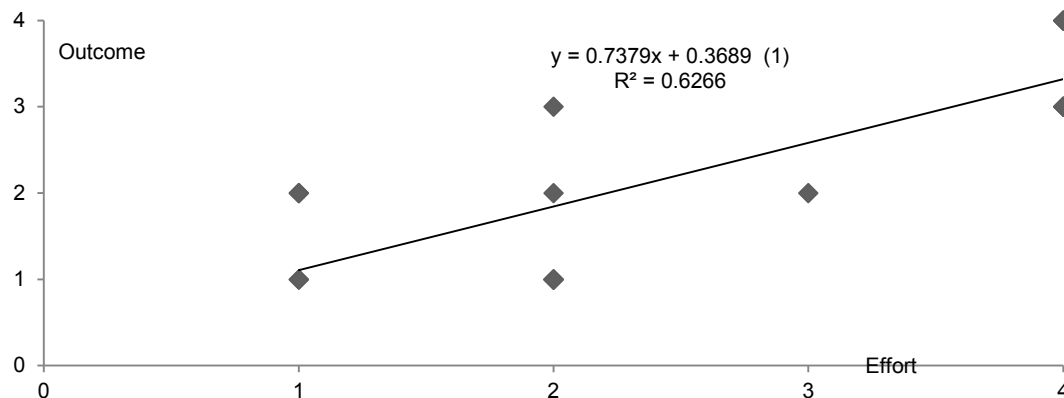
This figure shows the impact of effort on course outcomes, the trend line, the regression equation, the correlation and coefficient of determination, estimating that 63% of outcome variance is due to effort levels. One dot or point represents several cases.

The regression equation found is

$$Outcome = 3.69 + 0.738 * Effort \tag{1}$$
$$t = 5.02, p = 0.00,$$

The 95% confidence interval for R= 0.79 has a low limit of 54%, and 93% as an upper limit. Furthermore, as we can see in Figure 3, the confidence interval is substantial since it explains 63% of outcome. Outcome levels have assigned codes according to Table 2. The correlation coefficient between grades and outcomes was also considerable, 0.81. The 0.81 correlation coefficient between grades and outcomes shows that student's opinion on outcomes is consistent with grades.

CONCLUDING COMMENTS

Our research focus on proposing answers to crucial questions for improving statistics teaching. On one hand, there is the traditional perception that statistics is abstract, not useful, rigid, and that generates anxiety and negative attitudes especially in management science and socials students. On the other hand, there is the belief in society and its decision-makers that it should be a statistical literacy among its citizens for a better quality of life and better decisions-making processes.

In this exploratory research, we have tried to give the study of statistics an interesting approach, with meaningful learning, usefulness, and with an existential or experiential approach to understanding, more accessible and even fun or enjoyable. We have adopted a model to try to induce Csikszentmihalyi flow experiences among students.

With this new approach via a meaningful and competency-based learning, teamwork and using modern information technologies, we are getting encouraging and statistically significant results. Based on a questionnaire applied to students, with the new approach most of them (96%) consider Statistics interesting or very interesting, 82% deem that is understandable and even simple, and 53% that is enjoyable or very enjoyable, and 71% that Statistics is useful or very useful.

We have also proposed a conceptual model that connects attitudes, efforts and results. With information from these same students, we have found that 63 % of the variance in course outcomes is explained by efforts, not withstanding other matters as luck or other factors which we also will continue researching. The correlation between efforts and results is 0.79, with a 95 % confidence that this correlation parameter, in similar populations, may be located between 0.54 and 0.93.

We may think that a limitation of this study is that since it is a small sample (less than 30) results could be context dependent, but t-statistical-test are significant, so we could say that results are rather approach dependent. Another limitation is that outcomes do not depend exclusively on attitudes and efforts. We agree on this comment but a direction for future research is that of following the *Conceptual Model of Impact of Attitude, Efforts, and other factors in Course Outcomes* that we have designed, we could include research personal traits and habits, and to ascertain outcomes based on structural equations modeling.

APPENDIX

Context or Background of This Exploratory Research

The background or context of this exploratory research is a statistical analysis course taught in a school of business named FACPyA UANL, a university located in Monterrey, México (www.uanl.mx). This course corresponds to the semester January-June and is pursuing a competency-based education model. Some relevant details of this course are the following.

Course: Statistical Analysis in Management Process Course

Purpose: This course will help FACPYA student achieve correct applications of statistical analysis in the management process and its environment, supporting the general and specific professional competencies as stated in the UANL educational model.

Specific Competency Supported by This Course: This course supports the specific competence related to the optimal resource management of any organization through the responsible use of innovative technologies and processes in decision-making, performing advisory functions or specialized consulting to help create value and improve its competitive position.

Course Expected Outcomes: The student will identify the fundamental concepts of statistics, data description, through the effective management of data grouping and presentation techniques and analysis of measures of location and dispersion.

The student will demonstrate the understanding of concepts of probability, its rules, as well as some discrete and continuous distributions for the proper handling of the normal distribution as a tool for parameter estimation and hypothesis testing (mean, proportion, correlation methods and regression coefficients).

The student will demonstrate the understanding of concepts of correlation and regression between two variables applied to a specific problem.

The student will present a research project with information from a real company in which he/she applies the acquired knowledge in this course.

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ACKNOWLEDMENTS

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STRATEGIC NETWORKS OF HIGHER EDUCATION INSTITUTIONS: EVIDENCE FROM EUROPE

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ABSTRACT

The purpose of this study is to present the establishment, activities and the results of the Consortium on Applied Research and Professional Education, which is the strategic network of higher education institutions. The study analyses the role of trust in strategic partnerships and the benefits of networking. The concept of trust has been used to plan the structure of the strategic network and create a cohesive network with common interests. The strategic network promoted student and staff exchange, research and development projects and the sharing of knowledge and good practices. The consortium is the first strategic network of its kind established by five European universities of applied sciences. The findings of this study are useful to the administrators of educational institutions as they improve internationalization and institutional performance.

JEL: M1, R1

KEYWORDS: Strategic Management, Trust, Networking, Higher Education

INTRODUCTION

The European development in the funding of research and development has increased the sophistication of communication and collaboration, so that the role of autonomous higher education institutions without trustworthy partners and social networks is no longer reasonable. The core idea of network theories is that networks of experts create benefits and value, which are hidden in social relations characterized by trust and reciprocity. The networks raise the ability of members and community to participate and interact when resolving common problems (Cross and Barker, 2014).

Trustworthy strategic networks enhance the willingness of people to act in a way that is beneficial to the network and institutions. For the purpose of the study, we define *international strategic partnerships* as, relatively enduring collaborative arrangements that utilize human and financial resources and governance structures from autonomous institutions located in several countries for the joint accomplishment of individual and organizational goals. Strategic partners are those mentioned in the strategic plans or otherwise deemed important for the future success based on agreements, stipulations or practices. The purpose of this study is to analyze trust and the extent of networking in the strategic network of higher education institutions. The study presents the establishment and activities of the Consortium on Applied Research and Professional Education (CARPE) of five European universities of applied sciences. CARPE is the first network of its kind, providing opportunities for research and development projects, student and staff exchange and sharing knowledge and good practices.

The collective trust of a network is separate from the interpersonal relationships within an organization. Therefore, trust must be assessed at the organizational and network levels. It is essential to create trust in a system of expertise, which is not specific to an individual. *Institutional-based trust* is a belief that the necessary impersonal structures are used to enable trust formation (McKnight, Cummings and Chervany, 1998). In institutional and network trust, formal mechanisms such as agreements and contracts are used to determine the extent of trust (Zucker, 1986). The European strategic network is important from the

viewpoint of the European Union, because among other things it promotes economic and social progress by strengthening economic and social cohesion. The network of higher education institutions implements the policy in a very reasonable way, because education and research and development create capabilities that are needed for European progress and cohesion. Europe is an important market area of the enterprises, which the CARPE partners will support by producing a skilled labor force and carrying out research and development projects. The remainder of this paper is set up as follows. The next section includes the literature review which shows that trust brings the confidence to demand collaboration especially in the projects of research and development. Trust is balanced with the activity and the supply of opportunities provided by the network to create an equilibrium of trustworthy partners. The third section includes data and methodology, which describes the European strategic network, criteria for membership and the governance. The fourth section presents the results and discussion. The concluding comments are presented in the final section.

LITERATURE REVIEW

Earlier studies attribute trust to relationships (Bell, 2001; Kramer, 1999), but Anderson, Steinerte and Russell (2010) have extended it to interpersonal, institutional and contextual trust. When we say that someone is trustworthy, we mean that he or she will perform an action that is beneficial or at least not detrimental to us (Gambetta, 1988). As a relational matter, trust depends on the quality of the interaction. Personal contacts, communication, availability of information and transparency help partners build trust. They contribute to the reciprocity of trust, which is as an expectation that others will return trusting behavior in kind (Kramer, 1996; Tyler and Kramer, 1996).

Trust has been defined in behavioral terms: a trusting individual makes a low personal investment in monitoring and enforcing the compliance of the individual with whom he or she has made a contract which he or she sees as beneficial (Levi, 1996). Trust is an essential tool in reducing transaction costs (Jack and Anderson, 2002). Trust can be conceptualized in institutional terms, where institutions set formal or informal norms to achieve benefits with low transaction costs. Transactions require personnel to search for partners, to negotiate with them and monitor agreements. If partners can trust each other, the transaction costs can be significantly reduced and quality improved.

Institutional trust accompanies the relational trust. Many studies have reported on the importance of laws, regulations and formal contracts for trust (Volery and Mensik, 1998). The formal law may create trust by creating confidence in the legal system. Regulations and contracts may create trust since effective law creates confidence and makes it easier to trust in other relations. Agreements between higher education institutions are typically voluntary. Even though they are not financially binding, they still provide a guarantee of compliance. There are many models of trust but not all of them do address the multi-partner property of trust or reputation in networks. Anderson, Steinerte and Russell (2010) mention contextual trust, where coordinators of research and development projects do not trust people *per se*, but particular circumstances. There are constitutive expectations in trust relationships. Therefore this study analyzes the networks of research and the development projects of higher education institutions when they apply for funding from the European Union or from elsewhere.

Trust is clearly limited to a number of partners, because it is impossible to trust everybody and the number of contacts is limited by time constraints. If the number of partners in the network increases, so do the transaction costs but the benefits of the project decrease. We can conclude that trust decreases with the number of partners in the network. At the same time, if the activity of the network increases, so does the number of partners and so do the benefits. The networking activity provides opportunities, but not all these opportunities are found to be beneficial because trust decreases. Clearly there is an equilibrium determined by trust for the collaboration and activity of collaboration in the network.

Figure 1 depicts the changing equilibriums in the network. Part A of the figure describes a situation where trust has a positive shift in the research and development market, which may be due to the better stipulations and funding regulations. As a consequence, the benefits of the project increase due to lower transaction costs and the number of partners can be increased. Part B of the figure describes the increasing opportunities in the network based on the positive activity shift of the partners, which may be due to the budget cuts of the central government in the basic funding of institutions which motivates to look for external funding opportunities. As a consequence, the number of partners increases, but the benefits of the project diminish because the transaction costs of communication and collaboration tend to increase. It can be concluded that trust is equal to the demand for collaboration and it must be balanced with the activity in networking to reach the equilibrium, which determines the number of partners and benefits in the network.

DATA AND METHODOLOGY

The Vice-Rector of HU University of Applied Sciences and the Rector of the Turku University of Applied Sciences planned the first ideas of the network in 2008. After three years of preparations and negotiations four European higher education institutions signed the agreement about the strategic network to form CARPE in November 2011. CARPE is an association under Dutch legislation. Manchester Metropolitan University was accepted for the full membership in 2012.The Consortium on Applied Research and Professional Education (CARPE) network includes the following institutions 1.) HU University of Applied Sciences Utrecht (Hogeschool Utrecht), 2.) Turku University of Applied Sciences (Turun ammattikorkeakoulu), 3.) Polytechnic University of Valencia (Universitat Politècnica de València), 4.) Hamburg University of Applied Sciences (Hochschule für Angewandte Wissenschaften Hamburg), and 5.) Manchester Metropolitan University. The CARPE network supports the economic and social cohesion in the European common market and create benefits for the universities of applied sciences in various countries. Trust and the number of members in the network were discussed in the first meetings.

Trust was considered an important element of CARPE when the formal network was established and the agreement was signed. The leaflet of the first conference in Utrecht crystallized the idea: "Trust is important in joint research and development. If you have good partners, you have better results." This statement reflects the idea that the number of institutions in the network must be relatively small to ensure trustworthy activities and high-quality results. The motivation for the strategic collaboration was that the most important target market of the enterprises is in Europe. For example, about 55% of Finland's exports go to Europe. Exports are important for the Finland's small open economy.

The share of exports is nearly 40% of the gross domestic product. Another motivation is the external funding from the European Union, which makes student and staff exchange possible in addition to international research and development projects. The key objectives of the network are 1.) Exchange and collaboration in European research programs, 2.) Development of joint study programs, 3.) Exchange of students and staff, and 4.) Establishment of a strong European reputation. The student and staff exchanges financed by Erasmus funding from the European Union creates possibilities to plan research and development bids and to develop joint study programs. The research and development projects are planned to serve the enterprises and other organizations in the regions of the institutions. The criteria of calling members to the network were analyzed and discussed in many meetings. The higher education institutions were selected based on similarities in the curricula and offerings, which facilitate student and staff exchange. The differences in the strengths of institutions enable the collaboration and distribution of work in applied research and development. All the members in the network are universities of applied sciences, which have applied research and development and professional education to promote regional development. The Manchester Metropolitan University and the Polytechnic University of Valencia have doctoral programs, but the other institutions in the network have education only to the master's level. The member institutions have strong roots in their regions and a substantial role in the economic, social and cultural life of their community.

Figure 1: Increasing Trust and Activity in Networks
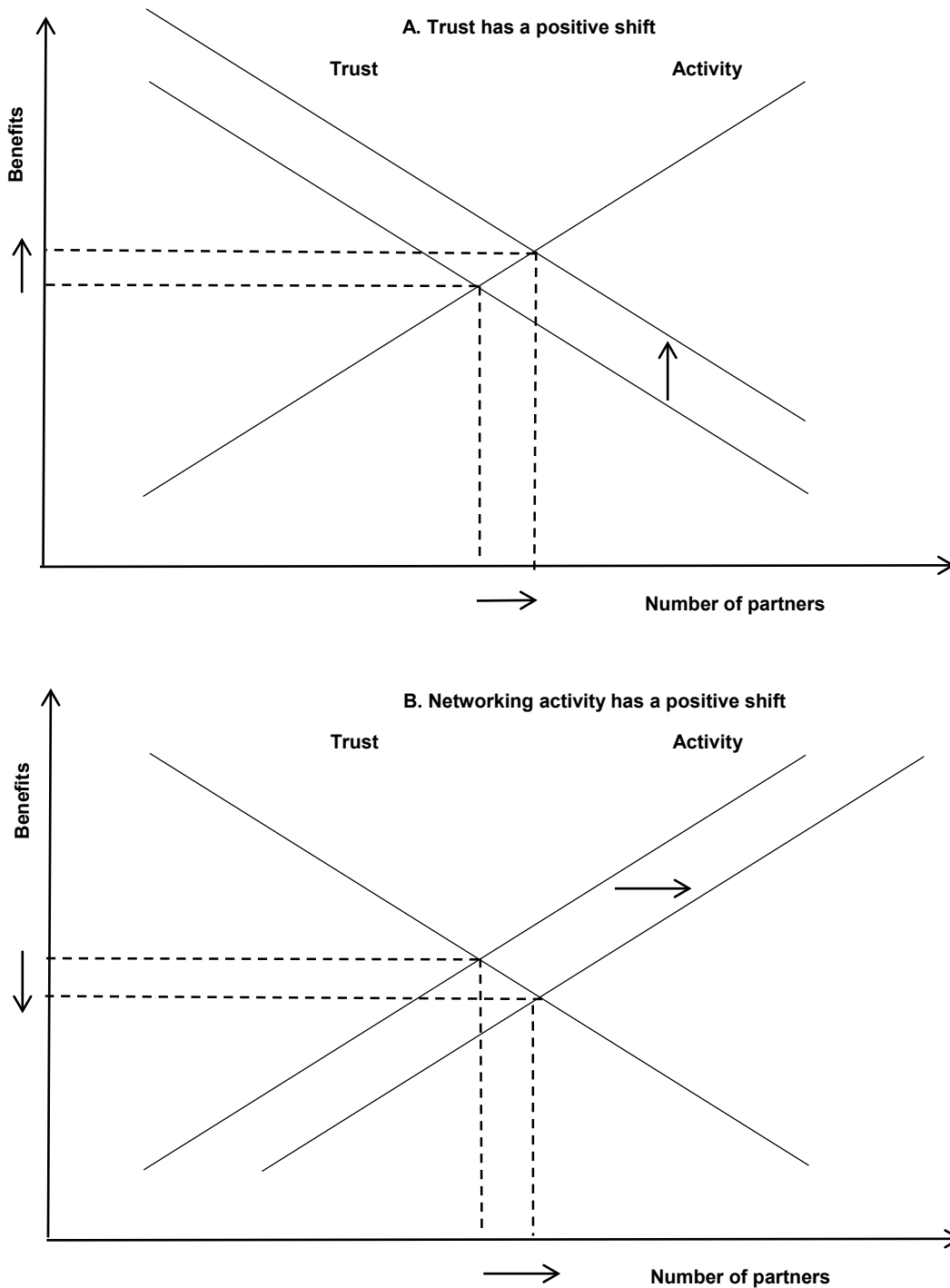
Part A indicates that the positive shift in trust increases the number of partners in the network and the number of benefits obtained from the research and development project. Part B indicates that the positive shift in the activity increases the number of partners and decreases the benefits of the project due to the increasing transition costs.

The institutions promote collaboration to disseminate, implement and commercialize knowledge and skills in their regions particularly focusing on small and medium-sized enterprises, but also with large enterprises and public sector. Informal working groups, project groups and meeting are used to plan education, research and development and other activities. The institutions also promote innovations, in the form of new or improved products, services or processes to meet market needs (Tidd Bessant and Pavitt, 2001; Bessant, Lamming, Noke and Phillips, 2005). The Turku University of Applied Sciences developed innovation pedagogy for the universities of applied sciences to create efficiency and improve external impact on the region (Kettunen, 2011; Kantola and Kettunen, 2012; Kettunen, Kairisto-Mertanen and Penttilä, 2013). The institutions respond to the development needs of the enterprises and other organizations in the region. Research and development projects are typically interdisciplinary and integrated into education. The projects provide opportunities for students to create skills for development work. International activities promote innovations, which encourage for entrepreneurship. Lecturing is supplemented by the collaborative learning in groups and networks. Students learn to think creatively and work collaboratively in groups and networks to solve design problems (Pun, 2014).

New members are accepted by invitation by the Steering Committee. One important criterion for membership of the CARPE network is the geographical spread in Europe. At the first phase, the network is located mainly in Western Europe. There have been plans to extend the coverage and activities to Eastern Europe. The Steering Committee assessed the joint activities of potential associate members and accepted the University of Debrecen in Hungary for an associate member in November 2014. The university can be considered as full member in the future. Figure 2 depicts the governance of the CARPE network. The Steering Committee, in the center of the figure, comprises the heads of member institutions and support group, consisting of the international relations officers from each member institution. The Steering Committee is the highest decision-making body, and meets twice a year to assess progress, plan improvements and make decisions. Regular communication is essential in building rapport and understanding, which is the basis for a long-term relationship among the institutions. Face-to-face discussions establish collaborative interpersonal relationships.

The Steering Committee has specially designated groups to perform development tasks and make decisions. The support group prepares the agenda for the meetings of the Steering Committee. The communication group prepares the webpages, leaflets and other communication. Working groups and theme groups perform other pre-determined development tasks. Each institution nominates its own members of the groups. CARPE is an open network, because all the higher education institutions and partners can join the projects and other activities if the project groups of CARPE deem it necessary to achieving the objectives of a project. Active participation in joint projects and other activities opens up possibilities for associate memberships and finally for full memberships. Active collaboration generates trust, improves collaboration and keeps the full members of CARPE in projects and other joint undertakings.

There are no membership fees of the CARPE network, because each institution pays its own administrative, traveling, accommodation and other costs. The research and development projects are financed by the European Union. The student and staff exchange is financed by the Erasmus. The governance structure is deliberately simple in order to avoid unnecessary bureaucracy and to preserve the autonomy of each institution. According to the Statutes of CARPE, the parties will promote cooperation among student associations at their institutions. The active members of the student associations attend CARPE Conferences and met students from other member institutions. The participation of students is important, because the activities of support services, student exchange and the participation in international research and development projects create networks which are valuable after graduation

Figure 2: The Governance of the CARPE Network
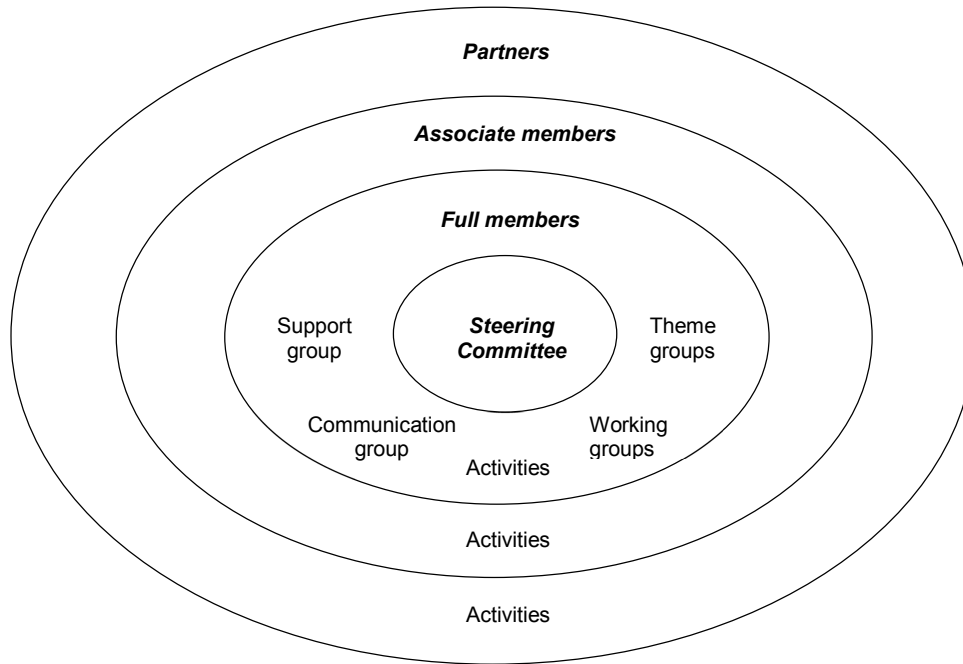
The role of the Steering Committee and groups supporting the activities of the CARPE network. The activities of partners open up opportunities for associate and finally for full memberships.

RESULTS AND DISCUSSION

Collaboration in the Consortium on Applied Research and Professional Education (CARPE) has remarkably increased the external funding of the institutions. The network considers other CARPE members as the preferred partners in the new research and development projects. The collaboration has increased the external funding for the research and development of the Turku University of Applied Sciences to 7.6 million Euro in 2013. Nearly 60% of the external funding has been obtained from the European Union. The Turku University of Applied Sciences was Finland's most active higher education institution in the Erasmus Lifelong Programme, participating in nearly in every third project during the 2007-2013 program period. Another important result is that student and staff exchange has increased among the CARPE members. The Turku University of Applied Sciences integrates research and development projects into education and invites students to participate. The international research and development projects offer international student exchanges and practical training supervised by the teachers and other personnel. Distance education, technology-based practices and collaborative learning are changing the traditional face-to-face teaching modes (DiRienzo and Lilly, 2014; Wali, Chowdhury, Alam, Wali and Islam, 2014). CARPE holds biennale conferences to share knowledge and promote collaboration. The conferences bring together personnel from the CARPE institutions to share expertise in research, support services and teaching. The first conference was arranged in Utrecht in 2011. The second conference was in Manchester in 2013. These are not traditional academic conferences where researchers present papers and posters; member institutions meet to share ideas and prepare collaborative projects for European funding bids. The network shares knowledge about higher education management. For example, the first CARPE Conference organized in Utrecht in 2011 demonstrated the importance of many research groups at the HU University of Applied Sciences Utrecht. The good experience with the research groups encouraged the Turku University of Applied Sciences to create its own research groups in 2013 and after the organizational

change scheduled for early 2015 the research and development activities of the institution are based entirely on the activities of the research groups.

The second CARPE Conference was organized in Manchester into a series of themes reflecting the major areas of collaboration of CARPE. There were 90 papers and 22 poster presentations on the following themes: Art and Design Networks (Applied Arts), Continuing Professional Development, Creative Engineering, Entrepreneurship, Quality Assurance in Higher Education, Sustainability, Social Innovation, Future of Healthcare, Spaces of Interdisciplinarity and Re-Inventing the Humanities. These themes reflect the common focal areas of CARPE members. Table 1 depicts the joint activities of the CARPE network obtained from the CARPE website (www.carpenetwork.org) in November 2014. Research and educational projects include planned and accepted projects financed by the European Union. The section of conferences and workshops includes two CARPE Conferences and five workshops to support research and development activities. The student and staff exchange consists of visits to member institutions. Other activities include publications, newsletters, videos and other useful information about the network. Newsletters describe the activities of the institutions. Enterprises and many other organizations have found the strategic network useful. They have participated in the research and development projects and obtained the latest knowledge from experts at higher education institutions. These organizations have created a skilled labor force, because they have hired young students for practical training, where students have also written their thesis. According to the recruitment statistics, the practical training of students is the most important way that education can create contacts and ensure employment for them.

Table 1: Joint Activities of the CARPE Network

Joint Activities	Number of Joint Activities
Research and educational projects	22
Conferences and workshops	7
Student and staff exchange	38

There have been 22 research and education projects. The projects have been planned during the conferences, workshops and exchanges. Two CARPE Conferences and five workshops have been arranged. Several people were included in many of the staff exchanges

CONCLUDING COMMENTS

This study presented the establishment and activities of the Consortium on Applied Research and Professional Education (CARPE), which is a European strategic network of universities of applied sciences. This is the first strategic network of its kind and serves as a model for other higher education institutions hoping to improve their international activities and institutional performance. Trust among the institutions is important and leads to a relatively small number of institutions in the network, but at the same time, the network encourages active collaboration in research and educational projects, conferences and workshops and student and staff exchange. There are five universities of applied sciences at the core of the strategic network. The purpose of the network is to create trust and shared knowledge so that the experts at each institution could contact experts at the other member institutions. The small size of the network is conducive to the establishment of trust, the sharing of common interests and the formation of coherence. CARPE is not a closed network, because any other partner can initiate a student and staff exchange and join the projects planned within the CARPE network. Conversely, other partners can invite the CARPE members to join their activities. In the course of its operation, the CARPE network has identified a range of elements that contribute to developing and sustaining its strategic membership among the

European universities of applied sciences. An important issue that has emerged is that institutions seeking to develop partnerships need to operate in a manner that is compatible with the common fields of education and research and development to promote student and staff exchange, but the strengths of institutions form a basis for research and development projects. The membership implies the need for institutions to be responsive to enquiries and readily available for collaboration to prepare joint funding bids to start projects

that will deepen the collaboration in the CARPE network. Further development of CARPE encompasses double degree programs, graduate schools, continued lobbying for funding and joint pedagogical development. The double degrees could extend the student and staff exchange, which would improve knowledge sharing and planning of research and development. Graduate schools' affiliations with research and development projects could improve the level of knowledge at the network. The universities of applied sciences also need better funding contacts and joint pedagogical outlines to develop networked learning.

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AN EXPLORATIVE STUDY OF VIRTUAL TRADING GAMES: A MEANS-END CHAIN APPROACH

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ABSTRACT

In order to help students acquire relevant knowledge on various financial investments in this rapidly changing environment of the global economy, it is crucial for educators to identify game elements that will attract students and keep them focused on learning. In this research, Digital Game-Based Learning and Means-end Chains have been chosen as the theoretical basis for the study, with ladder interview and content analysis as the tools of analysis to discuss the structure of the "game attribute-learning consequence – terminal value" chain of virtual trading games from the perspective of students. Results of the study revealed that through game attributes such as Diverse investment tools, Virtual chips, Team work, and Virtual platform, students were able to benefit from learning consequences including Practice for financial planning, Accumulation of investment experience, Reduction of error rate, Enhancement of team learning, Increased practical experience, Reduction of pressure and accountability and pursue terminal values such as Sense of achievement, Fun and enjoyment of life, Warm interpersonal relationships, Sense of security. Hopefully these findings will help educators to better understand students' value perception structure in digital education gaming in order to develop new teaching solutions, and game developers to design innovative game attributes.

JEL: M31

KEYWORDS: Digital Game-Based Learning, Means-end Chain Theory, Virtual Trading

INTRODUCTION

With the massive influx of innovative teaching technologies entering the classroom, teachers no longer play the dominant role in teaching/learning activities but instead assume diversified roles in these processes (Loveless, Devoogd, & Bohlin, 2001). Numerous studies conducted in the past have also pointed out that in an effort to boost students' interests in learning, teachers have attempted to blend games into their lessons so as to allow students to learn and acquire knowledge through gaming (Coller & Scott, 2009; Papastergiou, 2009; Robertson & Howells, 2008). During the process of Digital Game-Based Learning (DGBL), students will be able to simulate scenarios of reality in the game and thereby develop various advanced skills (Lin & Lin, 2014; Lin & Tu, 2012). DGBL not only offers ideal learning results but also encourages students to be proactive in their learning. In order to help students acquire relevant knowledge on various financial investments in this rapidly changing environment of the global economy, it is crucial for educators to identify game elements that will attract students and keep them focused on learning.

In order to create opportunities for students to get hands-on practice for online trading, colleges and universities in Taiwan have constructed learning systems that offer realistic simulation of actual financial trading environments. Virtual trading is also known by other terms including "Internet-Based Virtual Stock Markets", "Prediction Markets" or "Information Markets" (Servan-Schreiber, Wolfers, Pennock, & Galebach, 2004). Virtual trading has already been extensively deployed in teaching and research relating to finance and has provided adequate knowledge and experience for learners (Wu, Tseng, Chan, Huang,

Chu, & Chen, 2012). Past research has focused on the effects of using real and virtual currencies in virtual trading (Rosenbloom & Notz, 2006; Servan-Schreiber et al., 2004) while others have suggested that learners would be able to build their knowledge in a risk-free, simulated environment that is highly realistic (Hartley, 2006). PC simulation learning not only allows learners to engage in experiential online learning but serves as the most vital and essential component of digital learning/teaching software (Boehle, 2005). Nonetheless, few studies in the past have touched on the derivation of various learning consequences from their corresponding virtual trading game attributes or identified the values that each learning consequence had to offer learners.

Through the behavioral analysis of DGBL, results revealed that students in fact had a crucial impact on learning behavior and learning results. The needs of students inevitably have a foundation for development, which goes to highlight the value of DGBL for specific learning processes. In order to determine the terminal values that students seek from DGBL, the research has chosen Means-end Chains (MECs) as its theoretical framework coupled with Laddering as the tool for in-depth interviews, which were designed to reveal the structure of students' "game attribute – learning consequence – terminal values" chain for virtual trading. Hopefully, the results of the study will serve as a useful reference for digital educational game developers for innovative product development and marketing strategy formulation. As for educators, the findings of this research should also help them to identify suitable teaching principles and key points of instruction for digital game-based learning.

The paper is organized as follows. Section 1 briefs the motivation and purpose of the research. Section 2 reviews related literatures and studies about DGBL and the MEC theory. Section 3 structuralizes our research methodology consisting of research framework, the subjects participating, the method of data collection, and the analysis methodology. Section 4 summarizes and discusses the empirical results. Finally, Section 5 contains our concluding remarks and implication of the study.

LITERATURE REVIEW

Prensky (2003) believes that compared to the regular curriculum offered by schools, teenage students devote more focus on playing digital games than on their school work. The use of games for the presentation of course content can trigger students' motivation to learn and inspire them to grow independently while gaming. Past studies found that through the use of simple games for learning, teachers were able to raise students' learning motivation and output (Papastergiou, 2009; Virvou, Katsionis, & Manos, 2005). In fact, students were not only more inclined to focus on the subject matter but would actually take the initiative to engage in game-based learning (Ebner & Holzinger, 2007). A number of existing research papers have proven the positive effect that game-based learning has on education (Kirriemuir & McFarlane, 2004; Squire, 2005).

Following the rapid development and advancement of information technology, technological media have witnessed extensive application and gradual recognition in education. DGBL has achieved close cohesion between PC gaming and educational contents (Prensky, 2007) and in addition to becoming more popular in the fields of educational technology (Becker, 2007), it has emerged as a new model for digital learning (Aldrich, 2004; Squire, 2005). And as such, the feature of edutainment that DGBL provides enables students to discover a means of learning that is far more interesting than what they get from conventional textbooks (Embi & Hussain, 2005). Many previous studies have already pointed out that through the processing of playing digital games, students are able to develop many new cognitive abilities (Gee, 2003). Adopting DGBL as a teaching strategy will not only help students to boost their interest in learning, encourage them to be proactive in learning, create individualized opportunities for learning and experience transfers, will but also create a social learning network amongst students (Hsiao, 2007; Oblinger, 2004). On top of that, DGBL also offers concrete improvement of students' capacity for creative thinking, logical deduction,

critical thinking (McFarlane, Sparrowhawk, & Heald, 2002), reading ability, problem solving ability and strategic planning capabilities (Jenkins, 2002).

The means-end chains theory is proposed by Gutman (1982) and the theory was formulated in an effort to better understand customers' motivation at a deeper level. Through qualitative, in-depth interviews, one would be able to understand how consumers expect to arrive at their desired outcomes through specific products/service attributes, and the chains of the consequences would in turn be used to account for consumer behavior (Olson & Reynolds, 2001). Peter and Olson (2009) pointed out that when consumers choose to buy a product, it is not because the product has attracted the consumers but rather because the consumers believe that the product would help them achieve their desired goal or satisfy their needs. In other words, consumers buy products because they believe specific attributes of their chosen products would allow them to arrive at specific values they anticipate in their minds (Reynolds & Gutman, 1984). MECs can be broken down into three tiers of primary elements, namely Attributes, Consequences and Values (Olson & Reynolds, 1983). "Attributes" refer to the characteristics or features that consumers take into account while selecting products/services (Olson & Reynolds, 2001). Attributes can be divided into "Concrete Attributes" that are tangible or "Abstract Attributes" that are intangible (Peter & Olson, 2009). "Consequences" refer to more specific experiences/results that consumers expect from specific traits/characteristics of a product (Olson & Reynolds, 2001). Consequences can be divided into "Functional Consequences" that offer more concrete or direct experience to users or "Physiological Consequences" that generally refer to the more abstract psychological perceptions that users may have (Valette-Florence & Rapacchi, 1991). "Values" are important goals and targets that consumers strive to achieve through specific consequences they generate from particular attributes and can be separated into "Instrumental Values" and "Terminal Values" (Miele & Parisi, 2003).

DATA AND METHODLOLGY

Laddering is the most commonly adopted approach to the construction of MECs theories (Gutman & Miaoulis, 2003). Featuring one-on-one in-depth interviews, laddering involves "Direct Elicitation" that gradually unveils how users take advantage of attributes of a specific product in order to pursue their desired consequences/benefits and terminal values (Peter & Olson, 2009). A number of open-ended questions (as shown in Table 1) were posed to the learners to gather their responses. After the data had been collected, it was processed through the quantification technique of Content Analysis (Franzosi, 2008). After the data had been organized and sorted, the study used an Implication Matrix to record the chain correlations between different elements in quantifiable methods in order to summarize the tiers of various values constructed by the respondents (Reynolds & Gutman, 1988).

Table 1: Outline of the Interview Questions

Procedures	Semi-structured Questions
Laddering	1. What attributes or characteristics of virtual trading games appeal to you?
	2. Why do(es) the attribute(s)/characteristic(s)matter to you?
	3. What benefits or learning consequences does it offer?
	4. What personal values do you derive from the advantage/learning consequence?

This table shows the interview questions. Based on ladder structuring, the above open-ended questions were posed to the respondents in the above order.

Jones (2003) pointed out that 70% of the undergraduate student samples played PC games and 65% of those students were gamers. Considering Reynolds, Dethloff and Westberg (2001) proposal that samples of laddering interview should not be less than 20, the study has therefore adopted the approach of Purposive Sampling to select 50 users of virtual trading game platforms currently enrolled at different universities in Taiwan for in-depth interviews during the spring of 2013. Among the 50 respondents, 16 were male (32%) and the remaining 34 were female (68%); 33 of them were from national universities (66%) and the

remaining 17 were enrolled in private universities (34%); 35 of them major in Business and Management (70%) and the remaining 15 major in Finance (30%). On a related note, 23 (46%) of the respondents had previous experience in virtual trading competitions and the other 27 (54%) had no prior experience; 24 (45%) of them had no more than 1 month of playing experience while the other 26 (52%) had more than 1 month of experience with virtual trading games (as shown in Table 2).

Table 2: Demographics of Participants

Measure	Frequency	%	Measure	Frequency	%
Gender			Major		
Male	16	32	Business & Management	35	70
Female	34	68	Finance	15	30
Age(19-23)	50	100	Playing Experience		
Education(Undergraduate)	50	100	Below 1 month	24	48
University			More than 1 month	26	52
National	33	66	Competition Experience		
Private	17	34	Has	23	46
			Has not	27	54

This table shows the demographics of participants. The 2nd &5the columns report the number of different measures.

RESULTS

The study identified a total of 33 variables. It comprised ten (concrete and abstract) attributes representing the characteristics of the virtual trading games, fourteen (functional and psychological) consequences and nine values (as shown in Table 3). In addition, the 50 respondents constructed a total of 126 value ladders and 362 chains (as shown in Appendix A).

Table 3: Identification Classification of the Attributes, Consequences and Values

| Attributes	Consequences	Values
Concrete attributes	**Functional Consequences**	**Instrumental Values**
-Diverse investment tools (A1)	- Obtain information on current affairs (C3)	- Sense of security (V1)
- Virtual chips (A2)	- Increase practical experience (C6)	- Fun and enjoyment of life (V5)
- Offers information (A5)	- Facilitate independent learning (C9)	- Excitement (V7)
- Digital learning function (A6)	- Reduce pressure and accountability (C10)	
- Team competition (A10)	-Help with decision-making (C11)	
	- Enhance learning motivation (13)	
	- Train logical thinking (C14)	
Abstract attributes	Psychosocial Consequences	Terminal Values
- Mirrors the reality (A3)	- Practice for financial planning (C1)	- Sense of accomplishment (V2)
- Team work (A4)	- Accumulate investment experience (C2)	- Self-fulfillment (V3)
- Virtual platform (A7)	- Reduce error rate (C4)	- Well-respected (V4)
- Practice for operation(A8)	- Enhance team learning (C5)	- Warm interpersonal relationships (V6)
- Educational (A9)	- Integrate professional knowledge (C7)	- Sense of belonging (V8)
	- Facilitate positive competition (C8)	- Self-respect (V9)
	- Diversion of investment risks (C12)	

This table shows the identification classification in this study. There are 10 attributes, 14 consequences and 9 values. Attributes can be divided into "Concrete Attributes" or "Abstract Attributes". Consequences can be divided into "Functional Consequences" or "Physiological Consequences". Values can be s divided into "Instrumental Values" or "Terminal Values".

Figure 1 shows the important linkage paths of students playing virtual trading games. The following explains the major four paths respectively.

Diverse investment tools → Practice for financial planning → Sense of achievement : Virtual trading games feature a number of investment tools (such as securities, bonds, futures). Through virtual trading, students were able to use diverse investment tools and choose specific investment tools to obtain practice for

financial planning. In the process of practice, students could pick up many skills and techniques for financial management and derive a Sense of achievement from the experience.

Figure 1: Hierarchical Value Map of Virtual Trading Gamers
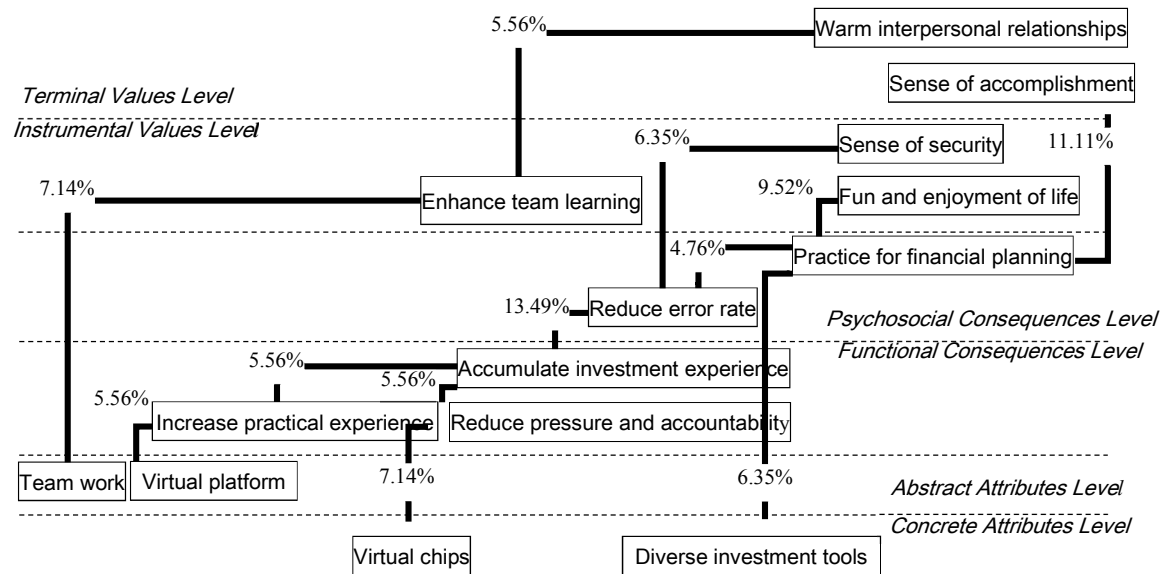
This Figure shows the HVM of the gamers. Four major routes were identified from the HVM. (1)Diverse investment tools → Practice for financial planning →Sense of achievement (2)Team work→ Enhance team learning→ Warm interpersonal relationship (3)Virtual chips→ Reduce pressure and accountability → Accumulate investment experience→ Reduce error rate→ Sense of security (4)Virtual platform→ Increase practical experience→ Accumulate investment experience→ Reduce error rate→ Practice for financial planning→ Fun and enjoyment of life The 50 respondents constructed a total of 126 value ladders. Percentages of links were depicted.

The reason why digital games are able to catch people's attention lies in their diverse features (such as continual challenge and victory) that were able to trigger gamers' intrinsic motivations and in turn evolve into a Sense of achievement (McGrenere, 1996). With Diverse investment tools, virtual trading in a volatile environment can generate an infinite number of investment combinations and possibilities. In order for students to effectively engage in Practice for financial planning, the study suggests game developers to design different game units for different investment tools and state the characteristics of various investment tools in corresponding units to enhance students' capacity and knowledge on the application of the featured investment tool.

Team work → Enhance team learning → Warm interpersonal relationship: Team work is a vital element of virtual trading. Through group discussions, students would be able to determine their investment target and directions. And by engaging in virtual trading in a team, students would not only be able to facilitate the flow and transfer of knowledge, but also Enhance team learning. By participating in multiple sessions of effective communication and immersed in an ideal atmosphere for learning, students will be able to benefit from the terminal value of Warm interpersonal relationships.

Lin and Tu (2012) pointed out that Team work not only facilitates diverse thinking for students but also has a significant influence on emotional exchange for students. The study by Bhatt (2004) also indicates that a connection system that incorporates network technologies would create a higher degree of social interaction. And as such, the study suggests game developers to design a Team work play format that uses internet connectivity to enable multiple students to engage in online learning simultaneously. This would not only resolve the issue of account sharing by multiple players but also allow students to form a social network of learning to enhance their learning results.

Virtual chips → Reduce pressure and accountability → Accumulate investment experience → Reduce error rate → Sense of security: A virtual trading system offers a substantial amount of Virtual chips for students to freely invest without any restriction. Students believe that since the use of Virtual chips does not involve the commitment of their personal assets in real life, they will be able to learn from virtual trading with a relaxed mindset in an environment that Reduces pressure and accountability. On top of that, students can also continually accumulate investment experience in this relaxed learning environment. Through virtual trading, students will gradually pick up the skills to Reduce error rate and ultimately arrive at the terminal value of Sense of security.

It is worth pointing out that when students use Virtual chips they might neglect modest amounts of investment or even make random investments due to the lack of pressure and accountability. This contradicts all forms of financial investments in the real world. And thus, the study recommends game developers to incorporate a system of currency conversion in their virtual trading games so that students would gain more authentic and practical experience through the conversion and exchange of currencies. This would hopefully help students to accumulate investment experiences that are more aligned to reality. Virtual platform → Increase practical experience → Accumulate investment experience → Reduce error rate → Practice for financial planning → Fun and enjoyment of life

The strength of a virtual trading system lies in the fact that it does not involve the presence of financial institutions; students may simply use a Virtual platform to make investments. Through the process of learning to invest, students will not only be able to Increase practical experience but also learn to reduce error rate through Accumulation of investment experience. When students reach specific levels of proficiency, they will be able to start their Practice for financial planning in pursuit of their terminal value of Fun and enjoyment of life. Simulation games provide an ever-changing environment for decision making processes for students, and through repeated decision-making, students will gradually learn the skills of diagnosing and resolving conflicts and be able to effectively apply these skills in the real world (van Houten & Verbraeck, 2006). Therefore, the study suggests game developers to incorporate various potential situations and scenarios that are likely to happen in real life in their Virtual platform so that students will be able to Increase practical experience and Accumulate investment experience. By facing and overcoming different situations.

CONCLUDING COMMENTS

This research has been designed to examine the correlation between the attributes of virtual trading games, learning consequences and terminal values. With MECs theory as the theoretical framework, the study adopted the laddering technique for data collection. The participants for this study were 50 college students. The next step involved the application of content analysis for data processing. The processed data produced a total of 10 game attributes, 14 consequences and 9 values. These factors were then processed with structural implication matrix and HVM to identify the chains of all variables for analysis and comparisons. HVM can be used to explain the students' psychology in the play of virtual trading game, indirectly explain the ultimate values the gamers pursued, and also explain the process of the gamers' behavior paths.

Results of the study showed that virtual trading not only brings about effective personal learning consequences but also facilitates group learning. Through virtual trading with diverse investment tools, students were able to Obtain information on current affairs and thereby Help with decision making in order to achieve the learning consequence of Practice for financial planning. Through the motivation to achieve outstanding investment performance, students would benefit from the consequence of Facilitating independent learning and eventually arrive at the terminal values of Sense of achievement, Self-actualization and Fun and enjoyment of life. At the same time, there are multiple game attributes that will enable students to Accumulate investment experience. Through the use of Virtual chips, students can

Reduce pressure and accountability and from there Accumulate investment experience; through a Virtual platform that features Digital learning functions and Mirrors reality, students were able to Increase practical experience during the process of learning about investment and trading, and in turn Accumulate investment experience. Accumulation of investment experience not only improves students' precision in the timing of trading but also helps them to reduce error rate in subsequent investments, to ultimately deliver the terminal values of Sense of security and Self-actualization.

The study found Enhanced team learning to be a fairly important learning consequence for virtual trading games. Since most students lacked actual experience with investment, it would be unlikely for them to be able to solve investment related issues immediately when they encounter such issues. And as such, it is crucial for students to find the right channels for problem-solving. The format of Team work helps students to overcome their shortcoming of being inexperienced in investment by enabling students to engage in discussions to determine investment decisions. The process not only facilitates the exchange of investment knowledge but also brings the consequence of Enhanced team learning. Students also believe that by fostering an atmosphere of learning for the team, it would bring about the terminal value of Warm interpersonal relationships. On the other hand, Team competition could facilitate positive competition among students if their investment performance were to be integrated with their academic grades; students who do well would in turn benefit from a Sense of achievement.

Therefore, the study suggests teachers to introduce small-group competition in their instructions before encouraging students to participate in various formal competitions once they have demonstrated specific level of progress. This should enable students working with virtual trading to benefit from more positive learning consequences. However, there is the limitation in this study. The study's samples may be biased in that the study surveyed players mostly university students. Future researches may choose other groups to compare the finding. For different demographics of virtual trading gamers, it is recommended that future researches focus on the differentiation of market segments (i.e. different majors). In addition, future research might concentrate on how virtual trading games can be applied in studying various aspects of course. A quantitative follow-up study based on the results is useful.

Appendix A. Implications Matrix of Virtual Trading Gamers

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	V1	V2	V3	V4	V5	V6	V7	V8	V9	Total
A1	8		5			3			4			2												22
A2	1	1								9														11
A3		3	5	1		4	1		1			1	2											18
A4				9																				9
A5		1	1	1							3													6
A6		4				4	2		2	2			2											16
A7	1	5				7			2	3				1										19
A8		2				2	1						2											7
A9	2	1			1	1	1		2				4	1										13
A10								5																5
C1		1		1											3	14	9	1	12		2			43
C2	3			17			1				2		1			3	4					1	1	33
C3		1		2							5	1	1			1	2							13
C4	6										1				8	3	6	1	4			1		30
C5													1					1		7		1		10
C6	3	7		4		3			3							1								21
C7	1							1	1		1					3	2							9
C8									1		1					4		1			1			8
C9	5		1	3									3		1	2	1	1	1					18
C10	3	7						1	1							2								14
C11	5							1							2	2	1		1					12
C12	1												1		1							1		4
C13	4		1	1			1									1	2	1	2		3	1		17
C14													1			1	1				1			4
Total	43	33	13	30	10	21	9	8	18	14	12	4	17	4	18	34	28	6	20	7	7	4	2	362

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