AN ANALYSIS OF PERSONALITY TRAITS AND LEARNING STYLES AS PREDICTORS OF ACADEMIC PERFORMANCE

Asst. Prof. Vikanda Pornsakulvanich, Ph.D.*,
Asst. Prof. Nuchada Dumrongsiri, Ph.D.**,
Pair Sajampun*, Suppasit Sornsri*, Surej P. John*, Tipa Sriyabhand*,
Chatkaew Nuntapanich**, Chulamani Chantarawandi**,
Parichart Wongweeranonchai**, and Smith Jiradilok**

Abstract

The present study examined the influence of Big Five personality traits and learning styles on cognitive and affective academic performance, and gender differences in learning styles. A survey research was employed to collect the data from the target population of students. Participants (N = 1,529) were students who enrolled in Business Administration and Communication Arts at Assumption University of Thailand.

Overall, the results indicated that personality traits found to be better predictors of cognitive and affective academic performance than did learning styles. Conscientiousness was a significant contributor of academic performance. Among five personality traits, Conscientiousness, Openness, Agreeableness significantly predicted cognitive academic performance, whereas Conscientiousness, Openness, Agreeableness, and Emotional Stability significantly predicted affective academic performance. Learning styles were also related to cognitive academic performance. Moreover, students in Business Administration reported higher scores in Conscientiousness, Agreeableness, and Emotional Stability than those in Communication Arts. The results showed no significant differences in learning styles between genders.

Keywords: Personality traits, Big Five, Learning styles, Academic performance, GPA, Satisfaction, Thailand

บทคัดย่อ

การวิจัยนี้ได้ศึกษาอิทธิพลของตัวแปรที่เกี่ยวกับ บุคลิกลักษณะ รูปแบบการเรียนรู้ และเพศ ว่ามีความสัมพันธ์อย่างไรกับผลการศึกษาทั้งด้านสติปัญญาและด้านอารมณ์ การวิจัยนี้เป็นการวิจัยเชิง

*The authors are full-time lecturers in Martin de Tours School of Management and Economics, Assumption University of Thailand.

**The authors are full-time lecturers in Albert Laurence School of Communication Arts, Assumption University of Thailand.

สำรวจจากกลุ่มตัวอย่างที่เป็นกลุ่มนักศึกษาจำนวน 1,529 ตัวอย่าง เป็นนักศึกษาในคณะบริหารธุรกิจและคณะนิเทศศาสตร์ มหาวิทยาลัยอัสสัมชัญ

ผลของการวิจัยโดยสรุปพบว่า บุคลิกลักษณะเป็นตัวทำนายผลการศึกษาได้ดีกว่ารูปแบบการเรียนรู้ ความมีจิตสำนึกเป็นตัวแปรบุคลิกลักษณะที่สามารถอธิบายผลการศึกษาได้มากที่สุด ในบุคลิกลักษณะทั้ง 5 ชนิดนั้น ความมีจิตสำนึก ความเปิดเผย และการโอนอ่อนผ่อนตาม มีความสัมพันธ์กับผลการศึกษาด้านสติปัญญา ส่วนตัวแปรความมีจิตสำนึก ความเปิดเผย การโอนอ่อนผ่อนตาม และความมั่นคงทางอารมณ์ มีความสัมพันธ์กับผลการศึกษาด้านอารมณ์ นอกจากนั้นรูปแบบการเรียนรู้ก็มีความสัมพันธ์กับผลการศึกษาด้านสติปัญญา ผลของการวิจัยยังพบว่านักศึกษาในคณะบริหารธุรกิจมีคะแนนสูงกว่านักศึกษาในคณะนิเทศศาสตร์ในตัวแปรที่เกี่ยวกับบุคลิกลักษณะด้านความมีจิตสำนึก ความเปิดเผยและความมั่งคงทางอารมณ์ ผลการวิจัยไม่พบความแตกต่างระหว่างเพศหญิงและชายในรูปแบบการเรียนรู้

INTRODUCTION

Students learn in many ways, and teachers differ in instructional methods. Nevertheless, both students and teachers share the same goal – to reach optimal learning. Educational programs and courses that are responsive to diverse student populations and their individual differences are essential. Scholars have explored and identified factors that contribute to academic success for students and teachers such as cognitive ability, stress-coping strategies, and emotional intelligence (Austin, Evans, Magnus, & O'Hanlon, 2007; Chen, Gully, Whiteman, & Kicullen, 2000; O'Connor & Bevil, 1996). Individual characteristics also affected students' behaviors and volunteerism in activities at school (Jarernvongrayab, Chuawanlee, Choochom, & Chittcharat, 2010). This research project focused on other aspects of students' individual differences – personality traits and learning styles.

Students behave and perform differently in class due to their prominent personality traits and preferred learning styles. For example, those who are extraverted and socially skillful may have difficulties in concentrating on academic materials and do poorly in school, whereas students who are ambitious and organized may strive for and enjoy academic achievement (Gilles & Bailleux, 2001). On the other hand, students who prefer visual perception may be most comfortable and perform better with a teaching method of charts, pictures, and video clips, but suffer in lecture-based class (Felder & Silverman, 1988).

Failure to observe individual differences in teaching and learning process leads to negative consequences for both ends. Students become inattentive, discouraged, and then forced to drop out of classes or school due to poor academic outcomes. Teachers experience unresponsive classes, poor attendance, and lower self-confidence wondering if they are doing things wrong and in the right profession. Shelton (2003) showed that high student retention resulted from high support from the institution by making them feel integrated

and valued.

Therefore, this research project aims to serve as a preliminary research to raise concerns for individual differences in personality traits and learning styles among students and teachers at Assumption University. As suggested by Litzinger, Lee, Wise, and Felder (2007), the ultimate goal of teaching and learning is not to provide individualized instruction, but to call for additional attention on a balanced instruction. With the findings of this research, we expect to observe and address students' individual differences and then allow us to develop classrooms that are student-centered and maximize their learning at the end.

PROBLEM STATEMENT

The study of the students' individual differences in Big Five personality traits and learning styles has been widely investigated. Researchers attempted to discover the effects of personality traits on many variables such as performance, satisfaction, and well-being (e.g., Judge, Heller, & Mount, 2002; Hurtz & Donovan, 2000). In the educational context, numerous studies explored the relationships among personality traits, academic performance, motivation, and satisfaction (Komarraju, Karau, & Schmeck, 2009; Oswald, Schmitt, Kim, Ramsay, & Gillespie, 2004; Paunonen & Ashton, 2001; Trapman, Hell, Hirn, & Schuler, 2007). In addition, empirical evidence has shown that the personality traits and learning styles were significantly associated with academic performance (Busatto, Prins, Elshout, & Hamaker, 1999; Chamorro-Premuzic & Furham, 2003).

Nevertheless, there is little evidence examining these relationships and the Big Five personality traits in Thailand (Kittisopee, 2003; Smithikrai, 2007). In addition, the study of the effects of personality traits in conjunction with learning styles on academic performance, particularly in the Thai educational context has not been discovered. Hence, it is noteworthy to apply the two frameworks – the Big Five and learning styles – to understand the extent to which students' personality traits (i.e., Emotional Stability, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness) and learning styles (i.e., sensing-intuitive, visual-verbal, active-reflective, and sequential-global) predict their academic performance and satisfaction. The Big Five and learning style frameworks are presented in the next section.

CONCEPTUAL FRAMEWORKS

The Big Five

In this study, we use the Big Five personality traits as our conceptual framework. Researchers have studied the Big Five for decades. However, there has been the different point of views on the dimensions and definitions of the Big Five (Goldberg, 1993). A well-accepted personality dimensions include Emotional Stability, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness (Costa & McCrae, 1995; Goldberg, 1993; Judge et al., 2002; McCrae & Costa, 1989; Saucier, 1994).

According to Goldberg (1993), Emotional Stability (ES) refers to those who are self-reliant, stable, and adaptable to new situations. This concept sometimes is called Neuroticism (Emotional Instability). Extraversion

(E) is defined as those who are sociable, gregarious, assertive, and cheerful. Openness to Experience (O) refers to those who are curious, unconventional, and imaginative. Agreeableness (A) refers to those who have the tendency to be cooperative, generous, altruistic, and warm. Conscientiousness (C) is defined as those who are dependable, organized, persistent, and goal-oriented.

Applying the Big Five framework in this study would allow us to understand differences in students' personality traits among Faculties and Departments and explore which the prominent traits would better predict academic achievement in different academic areas and disciplines. These associations would provide the fruitful knowledge for instructors to realize differences of students' learning and performances and to have insight into students' behaviors and the way that instructors would help students for their academic success.

Learning Styles

As another conceptual framework for this research project, learning styles are defined as cognitive, affective, and psychological characteristics that function as stable indicators of how people learn and respond to a learning environment (Felder & Spurlin, 2005; Ku & Shen, 2009). Learning style analysis has become a major concern in most sectors of education for many years in response to problems of differences in learning approaches among students. Past research widely recognized that academic achievement depends not only on a learner's intellectual ability, but also on the individual's preferred learning styles (Kolb, 1984). The study of learning styles aims to accommodate a teaching and learning process based on students' individual differences and preferences (Felder & Silverman, 1988). Frederico (2000) suggested that no single strategy is best for all students, but teaching methods are to be adapted to accommodate their individual differences.

The current study employs Felder and Silverman's (1988) learning styles. They developed their learning styles from previous models: the Kolb's Learning Style Inventory (Kolb & Kolb, 2005), Jung's theory of psychological types, and the Myers-Briggs Type Indicator (Alaoutinen, Heikkinen, & Porras, 2010). Initially, Felder and Silverman identified a student's preferred learning style into five dimensions: sensing-intuitive (how information is perceived), visual-verbal (how information is presented), inductive-deductive (how information is organized), active-reflective (how information is processed), and sequential-global (how information is understood). Later, Felder (2002) noted in the preface added to the original article that the inductive-deductive dimension was dropped and the visual-auditory was changed to visual-verbal dimension.

Felder and Silverman (1988) suggested four dimensions of learning styles: (1) sensing-intuitive, (2) visual-verbal, (3) active-reflective, and (4) sequential-global. Sensing learners like to observe facts, gather data, and prefer to solve problem via standard methods, whereas intuitive learners are innovative, prefer theories, and dislike repetition. Visual learners remember best what they see and prefer visual information such as diagrams, pictures, and flowcharts while verbal learners remember best what they hear and like written/ spoken explanations.

Active learners enjoy experimentation to try things out, like to work in groups, and dis-

like being passive. Reflective learners prefer to spend time examining and thinking through information and like to work alone. Finally, sequential learners learn through linear steps and can work with partial or superficial information. On the other hand, global learners follow holistic thinking process and are able to connect difficult materials and synthesize information.

Applying the Felder and Silverman's (1988) learning style model would allow us to classify students based on their preferred styles. Understanding the differences among students from various Faculties and Departments would help instructors to facilitate and balance their teaching for all types of learners for a better learning. In additional, a few studies measured directly the relationships among the Big Five, learning styles, and achievement (Busatto et al., 1999).

Research Objectives

Thus, this research project was to explore the influence of personality traits and learning styles on how well students across disciplines perform in class. This study served four purposes: (a) to determine the influence of Big Five personality traits on academic performance, (b) to study the influence of learning styles on academic performance, (c) to examine gender differences in learning styles, and (d) to explore the differences in prominent personality traits among Schools and Departments.

Literature Review

In this part, prior studies on the relationships among Big Five personality traits, learning styles, and academic performance are reviewed. Prior studies attempted to understand which factors are significantly involved with students' academic success. Studies suggested that cognitive and non-cognitive individual differences play a crucial role in the development of knowledge (Furham & Chamorro-Premuzic, 2004). In some studies, non-cognitive individual differences such as the Big Five are better predictors of academic success than cognitive ability (e.g., Furham & Chamorro-Premuzic, 2004; Furham & Chamorro-Premuzic, & McDougall, 2003; O'Conner & Paunonen, 2007). Many studies found that the personality traits and learning styles were directly related to academic performance (Barchard, 2003; Duff, Boyle, Dunleavy, & Ferguson, 2004; Noftle & Robins, 2007). Nevertheless, there are some controversy results of which personality traits and learning styles better predict students' academic achievement (Trapmann et al., 2007).

The Big Five Personality Traits and Academic Performance

Many researchers examined the effects of the Big Five on cognitive and affective academic performance including GPA, individual score, and satisfaction (e.g., Rothstein, Paunonen, Rush, & King, 1994; Trapmann et al., 2007). All five personality traits were found to be more or less influential to academic performance (O'Conner & Paunonen, 2007; Trapmann et al., 2007). Past research has shown that certain Big Five personality traits were more influential than the others to predict academic performance. Among all the Big Five, Conscientiousness was one of the most significant and consistent contributors to predicting academic achievement (Barchard, 2003; Duff et al., 2004; Noftle & Robins, 2007; O'Conner & Paunonen,

2007). In particular, studies also found that Conscientiousness was positively related to academic success (Barchard, 2003; Noftle & Robins, 2007), grades (Chamorro-Premuzic & Furham, 2003; Kappe & van de Flier, 2010; Oswald et al., 2004), GPA, and individual score (Duff et al., 2004; Laidra, Pullmann, & Allik, 2007; Paunonen & Ashton, 2001). This result suggested that students who had high Conscientiousness scores were more likely to perform better in the academic area than those who had low Conscientiousness scores.

Beside Conscientiousness, Openness to Experience is another Big Five personality that found to have a major contributor to academic performance. For instance, Barchard (2003) found that Openness to Experience positively predicted academic success. Rothstein et al. (1994) revealed that Openness positively predicted GPA and classroom performance. Laidra et al. (2007) studied students in the elementary and secondary school and revealed that Openness was one of the significant contributors to academic achievement. Moreover, Noftle and Robins (2007) examined undergraduate students and found that those who were high in Openness tended to have higher scores in the SAT verbal test scores. Despite the consistent findings of a positive association between Openness and academic success, some contradicted findings revealed that Openness found to have no influence on academic success (O'Conner & Paunonen, 2007).

Some studies have shown mix results for the other three personality traits including Extroversion, Emotional Stability, and Agreeableness. The evidence showed a negative relationship between these personality traits and academic performance. For example, Furham and Chamorro-Premuzic (2004) revealed that those who have high grades would have low scores in Extroversion. Moreover, Emotional Instability and Extraversion were negatively related to academic success (Duff et al., 2004), and examination grades (Chamorro-Premuzic & Furham, 2003). Rothstein et al. (1994) found that Agreeableness had a negative relationship with GPA. Also, Agreeableness was negatively related to classroom performance. Oswald et al. (2004) found a negative correlation between Extraversion and GPA.

Based on these inconsistent results of the Big Five predictors and academic performance and the scarcity of research in Thailand, this study sought to explore the relationships between Big Five and academic performance and satisfaction proposing in H1, H2, and RQ2. The next part is the review of the relationships between learning styles and academic performance.

LEARNING STYLES AND ACADEMIC PERFORMANCE

Numerous studies attempted to develop models to classify and measure learning styles in different ways (e.g., Kolb, 1984; Felder & Silverman, 1988; Vermunt, 1998). For example, Kolb's (1984) model categorizes learners into four groups: assimilators, accommodators, divergers, and convergers (Kolb & Kolb, 2005). Vermunt (1998) proposed four learning styles: meaning-directed (e.g., critical processing); reproduction-directed (e.g., memorizing or analyzing); undirected (e.g., lack of regulation), and application-directed.

However, across various learning style

models, prior research in education and psychology consistently showed that students learn in different ways and behave differently in courses that matched and mismatched with their learning styles (Kinshuk, Liu, & Graf, 2009; Suliman, 2006). According to Felder and Silverman (1988), engineering students tended to be sensors, liked facts, data, and experiments, and then earned lower grade in engineering courses that mainly emphasized concepts, lectures, and readings, which matched intuitive learners better. Sadler-Smith and Riding (1999) examined two dimensions of learning styles: wholist-analytical and verbal-imagery, which were similar to Felder and Silverman's (1988) sequential-global and visual-verbal, respectively. Wholists showed stronger preferences on collaborative learning with role plays, group discussion, business games, and nonprint-based instructional media (e.g., slides and video tapes) than did analytics.

Likewise, Kinshuk et al. (2009) found active learners experienced more difficulties in adapting to mismatch courses than did reflective students. Also, they reported that sequential learners in online course visited learning objects more often than global learners did, who requested for additional learning objects more frequent than sequential students did. Yi-An (2009) investigated learning style preferences, language learning strategy use, and English achievement for Taiwanese EFL students. The results showed that there was a positive relationship between the learners' preferred learning styles and their English achievement. They used auditory learning styles most often as their preferred style. Recently, Alaoutinen et al. (2010) revealed that the match between the learning styles and the teaching methods enabled the students to perform as a team better. Programming students were active, intuitive, visual, and sequential, and they acted differently in class. Reflective learners spent more time to reflect on the information before trying any actions.

Furthermore, the literature provides evidence that students with different areas of study have their specific learning styles. Technical and engineering students were more active, sensing, visual, and sequential (Alaoutinen et al., 2010; Felder & Silverman, 1988), whereas humanities students were more verbal than those in the sciences (Felder & Spurlin, 2005). Consistently, Ku and Shen (2009) indicated that Liberal Arts students were more verbal than other colleges while management and business students tended to be intuitive.

Gender differences were observed in learning styles and academic performance as well. Curry (1999) addressed the flaws in the cognitive- and learning-style literature that overlooked gender as an interacting variable affecting academic behavior. Ku and Shen (2009) supported Curry's concern. They found female students more intuitive and global, but less visual than males. However, the gender differences were varied by colleges. In Science, female and male students did not differ in learning styles.

Also, other studies showed that demographics such as gender, age, and working experience tended to serve as a mediating variable in a relationship between certain predictive factors such as learning styles and academic performance. For example, Chen and Fu (2009) reported that gender differences in Internet use affected academic achievement. Females used Internet to search for information, whereas males used Internet to play games. Students who used Internet as a source

of information scored higher than those who used it for playing games and social purposes. Thus, females were more likely to have better academic achievement. O'Connor and Bevil (1996) suggested that female nursing students used different strategies to cope with stress, which in turn influenced academic outcome.

Overall, several conclusions are drawn from the learning-style literature. First, students have their preferred learning styles that lead to different academic behaviors and outcomes. Second, learning styles are varied by fields of study such as engineering, management, liberal arts, and humanity, and by gender.

Based on the literature, this research project aimed to further investigate (1) how personality traits and learning styles of students affected their academic performance, cognitively and affectively; (2) how male and female students differed in their learning styles; and (3) how students from various faculties/majors differed in their prominent personality traits. Therefore, four hypotheses and two research questions were posed:

Proposed Hypotheses and Research Questions:

H1a: Personality traits (i.e., Emotional Stability, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness) predict cognitive academic performance (i.e., GPA).

H1b: Personality traits (i.e., Emotional Stability, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness) predict affective academic performance (i.e., course satisfaction).

H2a: Learning styles predict cognitive academic performance (i.e., GPA).

H2b: Learning styles predict affective academic performance (i.e., course satisfaction).

RQ1: Do males and females differ in learning styles?

RQ2: Which are the prominent personality traits among students from various majors and faculties?

RESEARCH METHOD

Research Design and Sample

This study used survey research to identify the predictions of personality traits and learning styles on academic performance. The purposive sampling was used to select the sample from the target population of students in two Schools: the Martin de Tours School of Management and Economics (MSM&E) and the Albert Laurence School of Communication Arts (CA) at Assumption University of Thailand. According to the Registrar Office as of Semester 2/2010, the total number of students in MSM&E was 9,130, consisting of 5,556 non-major students and 3,574 students in 12 majors. The total number of students in CA was 1,559, including 739 non-major students and 820 students in five majors.

Based on Zikmund (2003), at a 97 percent confidence level with 3 percent error, the sample size was estimated at a minimum of 823 for the MSM&E when the size of population was less than 10,000 and at a minimum of 619 for the CA when the size of population was less than 2,000.

Also, past research showed that classroom environment (e.g., technology equipment, class size, and traditional-online format) influenced students' performance (Clayton,

Blumberg, & Auld, 2010; Dorman, 2009). Thus, to control classroom condition, data were collected from students enrolled in standard classes that (1) provided basic equipment such as a computer and screen, a projector, and a microphone, and (2) were not activity-oriented. Thus, courses with special needs such as laboratory, studio, performance, and workshop were excluded.

Self-administered questionnaires were distributed in 41 courses, including major required courses and core courses. The questionnaire contains three sections: personality traits, learning styles, and demographics. Participants completed the questionnaire and were ensured about the confidentiality of their responses.

Participants (N = 1,529) were 657 males (43.0%) and 862 females (57.0%) with age range from 16 to 30 years old (M = 20.63; SD = 1.77). About 52.8% (n = 807) were undergraduates in MSM&E and 46.8% (n = 716) were in the School of Communication Arts. Nine participants did not report their school. Over 50% were students with majors and 42.2% were non-major (see Table 1). Six hundred eleven participants (40.3%) were senior students, 355 participants (23.4%) were juniors, 355 participants (23.4%) were sophomore students, and 196 participants (12.9%) were freshmen.

Measurement

Personality Traits. The Big Five personality traits were operationalized as the patterns of people's behaviors. The International Personality Item Pool (IPIP) (Goldberg, 1999) was used to measure participants' behaviors. The scale reflects the five-factor model traits: Emotional Stability (Cronbach α = .71); Extroversion (Cronbach α = .71);

Table 1: Sample of Major and Non-Major Students

	Frequency	Percentage
Major Students in School of Management (MSM&E) (n = 548)		
1. Accounting	61	4.0%
2. Business Economics	65	4.3%
3. Business Information Systems	32	2.1%
4. Finance and Banking	36	2.4%
5. Hospitality and Tourism Management	54	3.6%
6. Industrial Management	65	4.3%
7. Insurance	1	0.1%
8. International Business Management	40	2.6%
9. Management	43	2.8%
10. Marketing	111	7.3%
11. Real Estate	40	2.6%
Major Students in School of Communication Arts (CA) (n = 331)		
1. Advertising	94	6.2%
2. New Media Communication	35	2.3%
3. Performance Communication	63	4.1%
4. Public Relations	76	5.0%
5. Visual Arts Communication	63	4.1%
Non-Major Students	**641**	**42.2%**

Note. **N = 1529. Nine participants did not report their majors.**

Openness to Experience (Cronbach $\alpha = .70$); Agreeableness (Cronbach $\alpha = .66$); and (5) Conscientiousness (Cronbach $\alpha = .70$). Participants were asked to rate how accurately each statement described their behaviors. The scale contains 50 items with a 5-point scale ranging from *Very Inaccurate* (1) to *Very Accurate* (5). For example, the items are: *"carry out my plans", "respect others", "do not like art", "make friend easily*".

Learning Styles. Learning styles were operationalized as learning preferences on four dimensions of sensing-intuitive, visual-verbal, active-reflective, and sequential-global. The Felder-Soloman's (1997) Index of Learning Styles (ILS) (Litzinger et al., 2007) was used to measure participants' preferred learning styles. The scale consists of 44 items, representing 11 items for each dimension, with two forced-choice responses. Participants would select either "a" or "b" corresponding to two categories of the dimensions (e.g., visual or verbal). The score on each dimension is ranged from 0 to 11. Past research reported internal reliability ranging from .50 to .70 (Litzinger et al., 2007). In this study, the Cronbach's alpha reliability was ranged from .37 to .57. The examples of the items were: "*I understand something better after I (a) try it out, (b) think it through", "I remember best (a) what I see, (b) what I hear".*

Cognitive Academic Performance. Cognitive academic performance is operationalized as participants' Grade Point Average (GPA). Participants were asked to report their latest GPA.

Affective Academic Performance. Affective academic performance is operationalized as the extent to which participants feel satisfied with their classes. The items were adapted from those used in class/teaching evaluation conducted every semester at Assumption University. The scale consists of 16 items with a 5-point Likert scale ranging from *Strongly Disagree* (1) to *Strongly Agree* (5). For example, the items are: *"Classroom discussions are useful to my learning", "I am interested in learning this class", "I feel that I have learnt a great deal in this class"*. In this study, a Cronbach's alpha reliability was .87.

Demographics. Participants responded to general demographic questions about gender, age, school, major, admission number, school year, and GPA.

Data Analysis

A descriptive analysis was conducted to analyze the general demographic data obtained from the respondents. Scale reliability analysis was performed to determine the reliability of the measurement. For Hypothesis 1a and 1b, a separate multiple regression analysis was performed to determine whether the personality traits were the significant predictors of academic performance and satisfaction. For Hypothesis 2a and 2b, a separate multiple regression analysis was used to assess whether the learning styles predicted academic performance and satisfaction. For Research Question 1, an independent-samples *t*-test was performed to investigate whether male and female students differed in their learning styles. A Multivariate Analysis of Variance (MANOVA) and an Analysis of Variance (ANOVA) were conducted to determine the differences in personality traits among Schools and Departments in Research Question 2.

RESULTS

Hypothesis 1a posed that the personality traits (i.e., Emotional Stability, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness) predicted cognitive academic performance (i.e., GPA). Hypothesis 1a was partially supported. Multiple regression analysis indicated that five personality traits accounted for 6.5% of the variance in cognitive academic performance, $R = 0.26$, $R^2 = .07$, $F(5, 1410) = 19.66$, $p < .001$. Emotional Stability ($\beta = -.06, p < .05$), Openness to Experience ($\beta = .12$, $p < 001$), Agreeableness ($\beta = .14, p < .001$), and Conscientiousness ($\beta = .09$, $p < .01$) were significant predictors of GPA. However, Emotional Stability was the only significant negative predictor, whereas Openness to Experience, Agreeableness, and Conscientiousness positively predicted GPA (see Table 2). Those who had high scores in Openness, Agreeableness, and Conscientiousness would have high GPA, whereas those who had high scores in Emotional Stability would have low GPA.

Hypothesis 1b posed that the personality traits (i.e., Emotional Stability, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness) predicted affective academic performance (i.e., course satisfaction). The hypothesis was partially supported. The results showed that five personality traits accounted for 15.2% of the variance in affective academic performance, $R = 0.40$, $R^2 = .15$, $F(5,1526) = 54.65$, $p < .001$. Openness to Experience ($\beta = .16$, $p < 001$), Agreeableness ($\beta = .24, p < .001$), and Conscientiousness ($\beta = .09, p < .001$) positively predicted course satisfaction (see Table 3). Those who had high scores in Agreeableness, Conscientiousness, and Openness would be satisfied with their learning class.

Hypothesis 2a posed that learning styles were related to cognitive academic perfor-

Table 2: Multiple Regression Analysis for Personality Traits Predicting Cognitive Academic Performance

Dependent Variable	Predictors	B	SE B	β
Cognitive Academic Performance				$R^2 = .07$***
	Extroversion	-.00	.00	-.02
	Agreeableness	.01	.00	.14***
	Emotional Stability	-.00	.00	-.06*
	Conscientiousness	.01	.00	.09**
	Openness to Experience	.02	.00	.12***

Note. *$p < .05$. **$p < .01$.***$p < .001$.

Table 3: Multiple Regression Analysis for Personality Traits Predicting Affective Academic Performance

Dependent Variable	Predictors	B	SE B	β
Affective Academic Performance				$R^2 = .15$***
	Extroversion	-8.31	.00	-.00
	Agreeableness	.03	.00	.24***
	Emotional Stability	.00	.00	.01
	Conscientiousness	.01	.00	.13***
	Openness to Experience	.02	.00	.16***

Note. *$p < .05$. **$p < .01$.***$p < .001$.

mance (i.e., GPA). The findings indicated that four learning styles accounted for 1.0% of the variance in GPA, $R = 0.09$, $R^2 = .01$, $F(4, 1410) = 3.40$, $p < .01$. The active-reflective dimension ($\beta = -.07$, $p = .01$), was the main contributor in predicting GPA. Thus, Hypothesis 2a was partially supported. Those who were active learners, enjoyed experimentation and liked working in group would be less likely to have high GPA, whereas those who were reflective learners enjoyed thinking through information and liked working alone would be more likely to have high GPA.

Hypothesis 2b examined the influence of learning styles on affective academic performance (i.e., course satisfaction). The results showed no significant relationships between learning styles and course satisfaction, $R = 0.07$, $R^2 = .01$, $F(4, 1526) = 1.81$, $p = .12$. Hypothesis 2b was not supported.

Research Question 1 asked whether males and females differed in their learning styles. An independent-samples t test showed no significant differences between genders and all four learning styles: active-reflective, $t(1516) = 2.61$, $p = .10$; sensing-intuitive, $t(1516) = 0.00$, $p = .97$; visual-verbal, $t(1516) = 0.93$, $p = .33$; sequential-global, $t(1516) = 1.58$, $p = .21$.

Research Question 2 asked which prominent personality traits among students from various Majors and Schools were. First, the descriptive analysis of personality traits from both Schools: MSM&E and Communication Arts showed that the most salient personality traits are Agreeableness ($M = 35.43$), Conscientiousness ($M = 33.60$), Openness to Experience ($M = 32.59$), Emotional Stability ($M = 31.13$), and Extroversion ($M = 30.91$) respectively. Second, we used an independent-samples *t*-test to examine the differences in personality traits between MSM&E and Communication Arts. The results revealed a significant difference in three out of five personality traits, which were Agreeableness $t(1521) = 5.78$, $p < .05$, Emotional Stability $t(1521) = 4.97$, $p < .05$, and Conscientiousness $t(1521) = 4.33$, $p < .05$. MSM&E students reported higher scores in all three personality traits than did Communication Arts students (see Table 4).

Finally, we used a Multivariate Analysis of Variance (MANOVA) to test differences among all Departments from both Schools. MANOVA yielded significant differences in personality traits among departments, *Wilks'* $\Lambda = .88$, $F(16, 1503) = 2.53$, $p < .001$, $R^2 = .03$. Then, we used an Analysis of Variance (ANOVA) to test the differences in each personality trait among departments and found differences in four personality traits: Extroversion, $F(16, 1520) = 2.58$, $p < .001$, Agreeableness, $F(16, 1520) = 2.71$, $p < .001$, Conscientiousness, $F(16, 1520) =$

Table 4: Mean Differences in Personality Traits between MSM&E and CA Students

Personality Traits	MSM&E	Communication Arts
Agreeableness	35.50*	35.40*
Emotional Stability	31.31*	30.95*
Conscientiousness	33.92*	33.24*
Extroversion	30.64	31.25
Openness to Experience	32.45	32.75

Note. *p < .05.

3.02, $p < .001$, and Openness, $F(16, 1520) = 3.12$, $p < .001$. Specifically, students majoring in Public Relations had significantly higher scores in Extroversion than those majoring in Business Information System and Finance. Students majoring in Management reported higher scores in Agreeableness than non-major students. Students in International Business Management had significantly higher scores in Conscientiousness than non-major, Visual Arts, and Real Estate students. Finally, those in Performance Communication, Public Relations, and Management had higher scores in Openness than non-major students (See Table 5).

CONCLUSION AND DISCUSSION

The present study aimed to understand factors influencing student's cognitive and affective academic performance and whether there were differences in participants' learning styles and personality traits. Four hypotheses and two research questions were raised. Overall, the results of this study confirmed the knowledge of the associations among personality traits, learning styles, and academic performance. The findings also extend the body of knowledge of personality traits and learning styles in the Thai context.

More specifically, personality traits were found to be better predictors of cognitive and affective academic performance than learning styles. The findings also confirmed past research suggesting that Conscientiousness was a significant and consistent contributor of academic achievement. Among five personality traits, Conscientiousness, Openness, Agreeableness were the main predictors of GPA, whereas four personality traits including Conscientiousness, Openness, Agreeableness, and Emotional Stability were the contributors of course satisfaction. It was quite surprising that Extroversion was the only variable that was not related to GPA and course

Table 5: Mean Differences in Personality Traits among Departments

Departments	Agreeableness	Emotional Stability	Conscientiousness	Openness to Experience	Extroversion
Non-Major	34.90***	31.51	33.15***	32.02***	30.94
Advertising	35.94	31.00	33.63	32.40	30.91
New Media	35.94	30.74	33.06	33.31	31.20
PC	35.12	29.37	33.28	34.12***	31.44
PR	36.50	29.61	34.77	34.22***	32.93**
Visual Arts	35.14	32.09	32.44***	33.07	30.40
Accounting	36.85	30.88	34.49	32.72	31.30
BE	36.11	30.87	33.81	33.57	30.37
BIS	34.34	31.65	35.37	32.47	28.13**
Finance	35.27	31.08	33.61	33.20	28.50**
Hospitality	35.81	31.96	33.81	32.11	28.87
IDM	34.83	31.06	33.27	32.48	31.57
IBM	36.33	30.80	36.05***	32.62	32.08
Management	37.42***	31.13	35.16	34.67***	29.63
Marketing	35.54	30.90	34.24	32.59	31.16
Real Estate	36.50	30.53	32.32***	31.63	31.03

Note. **p < .01.***p < .001.

satisfaction in this study. This result was inconsistent with prior studies suggesting the associations between Extroversion and GPA (Duff et al., 2004; Furham & Chamorro-Premuzic, 2004; Oswald et al., 2004). It is plausible to assume that academic achievement would not be affected by those who are sociable and cheerful. As Gilles and Bailleux's (2001) stated, extraverted and socially skillful people may have difficulties in concentrating on academic materials.

In addition, a set of learning styles was not a strong predictor of academic achievement. It was accounted for only 1.0% of the variance in GPA. In addition, only the active-reflective dimension significantly predicted GPA. Students who were reflective learners, enjoyed thinking through information and working alone tended to have high GPA. In the present study, however, it is in line with Kinshuk et al.'s (2009) revealing that reflective students adapted well when learning in different courses. Moreover, the results showed no gender differences in learning styles, which was consistent with Ku and Shen's (2009) study revealing no gender differences in learning styles among Science's students. This study can add on the knowledge of gender differences in learning styles in different disciplines (i.e., Business and Communication Arts).

One interesting result indicated that students in Business differed from students in Communication Arts in some of the personality traits including Agreeableness, Emotional Stability, and Conscientiousness. The result confirmed the different characteristics of students from different disciplines. Business students seem to be goal-oriented, grade-focused, and obedience, whereas Communication Arts students seem to be creative, informal, and independent. It is true and relevant to the specialized fields they are in. The findings help understand the differences in personality traits among students better and provide useful information to instructors to design the courses that can be better suited with students' learning styles.

All in all, the merits of this study would lie in academic and practical areas. As for the academic area, not only would this study serve as a preliminary stage to examine the effects of personality traits and learning styles on students' academic performance at the university level in Thailand, but this study would also add new knowledge to the field of psychology and education. Specifically, the application of theoretical concepts (i.e., Big Five and learning styles) tested in the Western cultures was extended to understand the nature of Thai students and what would affect their performance. For the practical area, the current research provided empirical evidence that would help instructors and professors to realize students' personality traits and learning styles affecting overall performance and accommodate them with the most suitable methods of teaching and appropriate activities to obtain a better performance and academic achievement. Also, the study provided insightful information for practitioners to design the courses that could help students to have a well-rounded knowledge.

Limitations and Future Directions

Even though the present study was carefully designed and conducted, it contains some limitations that should be taken into consideration.

First, the learning style scale received quite low reliability in this study. It was ranged

from Chronbach's alpha .37 to .57. Although past research reported the acceptable reliability of the scale ranging from .50 to .70 (Litzinger et al., 2007), this study suffered from the low reliability of the scale. It is possible that the questions could be too complicated and difficult for participants, especially for freshmen. Consequently, participants spent more time than we expected to complete the questionnaire. Future research may use other data collection methods such as an interview questionnaire to detect complicated questions and assist a target population in understanding difficult questions.

Second, our main dependent variables were GPA and course satisfaction. These two variables provided us the understanding of students' overall academic performance. However, examining academic performance and achievement could involve other variables such as individual and class scores (Duff et al., 2004; Laidra et al., 2007; Paunonen & Ashton, 2001), which may give us insightful information to understand students' learning patterns better.

Third, this study collected the data from 41 subjects in two Schools. The aim was to cover the subject taught in each major as well as non major and to represent the data of students in different majors. The data could give us the generalization of the population being studied. Nevertheless, the methods of teaching in each subject were different. Some classes focused on lecture, whereas the others emphasized class discussion and activities. These differences could affect how students view the class and their satisfaction. Future research should collect the data from the classes that have similar teaching methods to ensure the standardized data and control factors affecting students' performance and satisfaction.

ACKNOWLEDGEMENT

The authors would like to thank Assumption University for its support on a research grant for this project.

REFERENCES

Alaoutinen S., Heikkinen K., & Porras J. (2010). "Experiences of Learning Styles in An Intensive Collaborative Course". *International Journal of Technology and Design Education*. doi:10.1007/s 10798-010-9135-3.

Austin, E. J., Evans, P., Magnus, B., & O'Hanlon, K. (2007). "A Preliminary Study of Empathy, Emotional Intelligence and Examination Performance in MBChB students". *Medical Education*, 41, 684-689.

Barchard, K. A. (2003). "Does Emotional Intelligence Assist in the Prediction of Academic Success?", *Educational and Psychological Measurement*, 63, 840-858.

Biderman, M. D., Nguyen, N. T., & Sebren, J. (2008). "Time-on-task mediates the Conscientiousness-Performance Relationship". *Personality and Individual Differences*, 44, 887-897.

Busatto, V. V., Prins, F. J., Elshout, J. J., & Hamaker, C. (1999). "The Relation Between Learning Styles, the Big Five Personality Traits and Achievement Motivation in Higher Education". *Personality and Individual Differences*, 26, 129-140.

Chamorro-Premuzic, T., & Furnham, A. (2003). "Personality Predicts Academic Performance. Evidence from Two Longitudinal University Samples". *Journal of Research in Personality*, 37, 319-338.

Chen, S. Y., & Fu, Y. C. (2009). "Internet Use and Academic Achievement: Gender Differences in Early Adolescents". *Adolescence*, 44, 797-812.

Chen, G., Gully, S. M., Whiteman, J., & Kilcullen, R. N. (2000). "Examination Of Relationships Among Trait-Like Individual Differences, State-Like Individual Differences, And Learning Performance". *Journal of Applied Psychology*, 85, 835-847.

Clayton, K., Blumberg, F., & Auld, D. (2010). "The Relationship between Motivation, Learning Strategies and Choice of Environment Whether Traditional or Including an Online Component". British *Journal of Educational Technology*, 41 (3), 349-364.

Costa, P. T., & McCrae, R. R. (1995). "Primary Traits of Eysenck's P-E-N system: Three-and Five-factor Solutions". *Journal of Personality and Social Psychology*, 69, 308-317.

Curry, L. (1999). "Cognitive and Learning Styles in Medical Education". *Academic Medicine*, 74, 409-413.

Duff, A., Boyle, E., Dunleavy, K., & Ferguson, J. (2004). "The Relationship Between Personality, Approach to Learning, and Academic Performance". *Personality and Individual Differences*, 36, 1907-1920.

Dorman, J. (2009). "Associations between Psychosocial Environment and Outcomes in Technology-Rich Classrooms in Australian Secondary Schools". *Research in Education*, 82 (1), 69-84.

Federico, P. (2000). "Learning Styles and Student Attitudes toward Various Aspects of Network-Based Instruction". *Computers in Human Behavior*, 16, 359-379.

Felder, R. M. (2002). Author's preface. *Engineering Education*, 78, 674-681.

Felder, R. M., & Silverman, L. K. (1988). "Learning and Teaching Styles in Engineering Education". *Engineering Education*, 78, 674-681.

Felder, R. M., & Soloman, B. A. (1997). "Index of learning styles questionnaire". Retrieved November 20, 2010 from http://www.engr.ncsu.edu/learningstyles/ilsweb.html.

Felder, R. M., & Spurlin, J. (2005). "Applications, Reliability, and Validity of the Index of Learning Styles". *International Journal on Engineering Education*, 21, 103-112.

Furham, A., & Chamorro-Premuzic, T. (2004). "Personality and Intelligence As Predictors of Statistics Examination Grades". *Personality and Individual Differences*, 37, 943-955.

Furham, A., & Chamorro-Premuzic, T., & McDougall, F. (2003). "Personality, Cognitive Ability, And Belief about Intelligence as Predictors of Academic Performance". *Learning and Individual Differences*, 14, 49-66.

Giles, P. Y., & Bailleux, C. (2001). "Personality Traits As Predictors Of Academic Achievement". *European Journal of Psychology of Education*, 16, 3-15.

Goldberg, L. R. (1993). "The Structure of Phenotypic Personality Traits". *American Psychologist*, 48, 26-34.

Goldberg, L. R. (1999). "A Broad-Band-

width, Public-Domain, Personality Inventory Measuring The Lower-Level Facets Of Several Five-Factor Models". In I. Mervielde, I. J. Deary, F. De Fruyt, & F Ostendorf (Eds.), *Personality psychology in Europe* (Vol. 7, pp. 7-28) Tilburg, The Netherlands: Tilburg University Press.

Hurtz, G. M., & Donovan, J. J. (2000). "Personality and Job Performance: The Big Five revisited". *Journal of Applied Psychology*, 85, 869-879.

Jarernvongrayab, A., Chuawanlee, W., Choochom, O., & Chittcharat, N. (2010). "Perception Of Environment In Higher Education Institutions And Individual Characteristics Affecting Sustained Volunteerism In Undergraduate Students". *Journal of Behavioral Science*, 16(1), 1-16.

Judge, T. A., Heller, D., & Mount, M. K. (2002). "Five-factor Model of Personality and Job Satisfaction: A Meta-Analysis". *Journal of Applied Psychology*, 87, 530-541.

Kappe, H., & van de Flier, H. (2010). "Using Multiple and Specific Criteria to Assess The Predictive Validity of the Big Five Personality Factors on Academic Performance". *Journal of Research in Personality*, 44, 142-145.

Kinshuk, Liu T. C., & Graf, S. (2009). "Coping with Mismatched Courses: Students' Behaviour and Performance in Courses Mismatched to Their Learning Styles". *Education Technology Research Development*, 57, 739-752.

Kittisopee, T. (2003). "Association among Pharmacy Student's Personality Traits and Career Preferences". *Thai Journal Pharmacy Science*, 27, 81-90.

Kolb, A. Y., & Kolb, D. A. (2005). "Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education". *Academy of Management Learning & Education*, 4, 193-212.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, New Jersey: Prentice-Hall.

Komarraju, M., Karau, S. J., & Schmeck, R. R. (2009). "Role of the Big Five Personality Traits in Predicting College Students' Academic Motivation and Achievement". *Learning and Individual Differences*, 19, 47-52.

Ku, D. T., & Shen, C. Y. (2009). "Reliability, Validity, and Investigation of the Index of Learning Styles in a Chinese Language Version for Late Adolescents of Taiwanese". *Adolescence*, 44, 827-850.

Laidra, K., Pullmann, H., & Allik, J. (2007). "Personality and Intelligence As Predictors of Academic Achievement: A Cross-Sectional Studies From Elementary To Secondary". *Personality and Individual Differences*, 42, 441-451.

Litzinger, T. A., Lee, S. H., Wise, J. C., & Felder, R. M. (2007). "A Psychometric Study of the Index of Learning Styles". *Journal of Engineering Education*, 96, 309-319.

McCrae, R. R., & Costa, P. T. (1989). "The Structure of Interpersonal Traits: Wiggins's Circumoplex and the Five-Factor Model". *Journal of Personality and Social Psychology*, 56, 586-595.

Noftle, E. E., & Robins, R. W. (2007). "Personality Predictors of Academic Outcomes: Big Five Correlates Of GPA and SAT Scores". *Journal of Personality and Social Psychology*, 93(1), 116-130.

O'Conner, M. C., Paunonen, S. V. (2007). "Big Five Personality Predictors of Post-Secondary Academic Performance". *Personality and Individual Differences*, 43, 971-990.

O'Connor, P. C., & Bevil, C. A. (1996). "Academic Outcomes and Stress In Full-Time Day and Part-Time Evening Baccalaureate Nursing Students". *Journal of Nursing Education*, 35, 245-251.

Oswald, F. L., Schmitt, N., Kim, B. H., Ramsay, L. J., & Gillespie, M. A. (2004). "Developing a Biodata Measure and Situational Judgment Inventory as Predictors of College Student Performance". *Journal of Applied Psychology*, 89, 187-207.

Paunonen, S. V., & Ashton, M. C. (2001). "Big Five Predictors of Academic Achievement". *Educational and Psychological Measurement*, 65, 70-89.

Rothstein, M. G., Paunonen, S. V., Rush, J. C., King, G. A. (1994). "Personality and Cognitive Ability Predictors of Performance in Graduate Business School", *Journal of Educational Psychology*, 86, 516-530

Sadler-Smith, E., & Riding, R. (1999). "Cognitive Style and Instructional Preferences". *Instructional Science*, 27, 355-371.

Saucier, G. (1994). "Mini-Markers: A Brief Version of Goldberg's Unipolar Big-Five Markers". *Journal of Personality Assessment*, 63, 506-516.

Shelton, E. N. (2003). "Faculty Support and Student Retention". *Journal of Nursing Education*, 42, 68-76.

Smithikrai, C. (2007). "Personality Traits and Job Success: An Investigation in A Thai Sample". *International Journal of Selection and Assessment*, 15, 134-138.

Suliman, W. A. (2006). "Critical Thinking and Learning Styles of Students in Conventional and Accelerated Programmes". *International Nursing Review*, 53, 73-79.

Trapman, S., Hell, B., Hirn, J. W., & Schuler, H. (2007). "Meta-Analysis of the Relationship between the Big Five and Academic Success at University". *Journal of Psychology*, 215, 132-151.

Vermunt, J. D. (1998). "The Regulation of Constructive Learning Processes". British *Journal of Educational Psychology*, 68, 149-171.

Yi-An, H. (2009). *An Investigation of Perceptual Learning Style Preferences, Language Learning Strategy Use, and English Achievement: A Case Study of Taiwanese EFL Students*. Retrieved from ProQuest Digital Dissertations. (AAT 3374314)

Zikmund, W.G. (2003). *Business Research Methods* (7th ed.). Mason, OH: South-Western Thomson.

---

[1]Assistant Professor Dr. Vikanda Pornsakulvanich holds a Ph.D. in Communication Studies from Kent State University, Ohio, USA. Currently, she is a Deputy Chairperson in Marketing Department, Martin de Tours School of Management and Economics, Assumption University.

[2]Assistant Professor Dr. Nuchada Dumrongsiri holds a Ph.D. in Communication Studies from Kent State University, Ohio, USA. Currently, she is a full-time lecturer in Department of Public Relations, Albert Laurence School of Communication Arts, Assumption University.

[3]Pair Sajampun holds a Master of Commerce in Marketing with International Business from the University of Sydney, Australia. Currently, she is a full-time lecturer in Department of Marketing, Martin de Tours School of Management and Econom-

ics, Assumption University.

[4]Suppasit Sornsri holds a Master degree in Business & Managerial Economics from Chulalongkorn University, Thailand. Currently, he is a Ph.D. candidate in Business Administration and a full-time lecturer in Marketing Department, Martin de Tours School of Management and Economics, Assumption University.

[5]Surej P John holds a Master degree in Business Administration from Assumption University, Thailand. He is a Ph.D. candidate in Information Technology and a full-time lecturer in Marketing Department, Martin de Tours School of Management and Economics, Assumption University.

[6]Tipa Sriyabhand holds a Master degree in Science in Management from Assumption University, Thailand. Currently, she is a full-time lecturer in Marketing Department, Martin de Tours School of Management and Economics, Assumption University.

[7]Chatkaew Nuntapanich holds a Master degree in Business and Administration from Johnson and Wales University, Rhode Island, USA. Currently, she is a full-time lecturer in Department of Public Relations, Albert Laurence School of Communication Arts, Assumption University.

[8]Chulamani Chantarawandi holds a Master degree in Language and Communication (English Program) (Hons.) from National Institute of Development Administration, Thailand. Currently, she is a full-time lecturer in Department of Advertising, Albert Laurence School of Communication Arts, Assumption University.

[9]Parichart Wongweeranonchai holds a Master degree in Mass Communications from University of Leicester, U.K. Currently, she is a full-time lecturer in Department of Advertising, Albert Laurence School of Communication Arts, Assumption University.

[10]Smith Jiradilok holds a Master degree in Communication Arts in Films from Chulalongkorn University, Thailand. Currently, he is a full-time lecturer in Department of Performance Communication, Albert Laurence School of Communication Arts, Assumption University.