Chapter #1

THE RELATIONSHIP BETWEEN STUDENT'S APPROACHES TOWARD LEARNING AND ACADEMIC ACHIEVEMENT IN THE CHINESE CONTEXT

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ABSTRACT
This study examined the relationship between Chinese high school students' approaches toward learning and their academic achievements. Participants consisted of 14,021 eleventh graders from an eastern province in China. They took the National Standardized Test in three subject areas: Chinese language, mathematics, and English language. The total score was used as an indicator of their academic achievement. Students' approaches toward learning were measured in three aspects: self-confidence in learning, learning interests, and study habits. Questionnaires of self-confidence in learning and learning interests were adapted from PISA 2006 and PISA 2012. Study habits were measured with the questionnaire adapted from Academic Adjustment Inventory (AAT). The Pearson correlation and hierarchical linear regression results showed that the dimensions of students' approaches toward learning were significantly related to academic achievements. Results of analysis of variance after the control of student gender and socioeconomic status suggested that the top 25% of students in dimensions of approaches toward learning scored significantly higher than the bottom 25% of students with small effect sizes in their performance on the final examinations. This study suggests that helping students build good approaches toward learning may improve their academic achievements. Educators are recommended to put more effort into helping students cultivate learning confidence and developing interests in learning. Classroom teachers are advised to guide students in fostering good study habits and make study plans.

Keywords: self-confidence, interests, strategies, academic achievements.

1. INTRODUCTION

The aim of education is to promote students' comprehensive development (Anzai & Simon, 1979). Not only are learning outcomes important, but the quality of learning taking place during the learning process is equally important. It has been unanimously affirmed in educational research that students' approaches toward learning significantly affect their academic performance (e.g., Hugener et al., 2009; Jin & Si, 2004). For example, McDermott (1984) demonstrated that approaches toward learning could produce larger predictive effects on learning outcomes than intelligence. Most scholars also believe that approaches toward learning such as self-confidence in learning, learning interest, learning motivation, and study habits, are basic qualities that are closely related to and significantly impact learning (e.g., Bai, Chao, & Wang, 2019; Gorges, Maehler, Koch, & Offerhaus, 2016; Shen, Yang, & Fang, 2015).

Education reform in sizeable countries all over the world has shifted from focusing on academic performance to stimulating and cultivating students' approaches toward learning. For example, the United Kingdom, Germany, Switzerland, Australia, and other countries have started to develop new national curriculum standards on students' approaches toward learning. Many influential international organizations have also conducted empirical research on students' approaches toward learning and analyzed the influencing factors of students' approaches toward learning in different grades through large-scale assessment data. For example, the Programme for International Student Assessment (PISA), Trends in International Mathematics and Science Study (TIMSS), Program in International Reading Literacy Study (PIRLS), and National Assessment of Educational Progress (NAEP) have evaluated students' approaches toward learning in specific disciplines.

Chinese education is academic achievement-oriented, where students, schools, and parents focus on academic performance/test scores, which has caused an academic burden (Zhang, 2000). Therefore, under this specific context, teachers and parents are prone to neglecting the cultivation of students' quality of learning, limiting the comprehensive development of students (Zhou, 2016). Based on China's unique context, it is crucial to explore the relationship between students' approaches toward learning and their academic achievements. It is also important to examine approaches toward learning based on empirical, large-scale assessment data and propose relevant suggestions for education policy in China.

2. BACKGROUND

2.1. Theoretical framework

Humanistic Learning Theory provided the theoretical basis for this study (Maslow, 1965; Rogers, 1965). It emphasized that learning is student-oriented, which educators need to promote students' all-round development and self-realization. Rogers (1965) believed that meaningful learning should be encouraged. In this optimal learning atmosphere, students' learning quality can continue to positively affect their academic performance and help them achieve outstanding learning outcomes. This theory highlights the importance of students' approaches toward learning.

2.2. Definition of approaches toward learning

Various definitions of approaches toward learning exist in the literature. Shenzhen Education Bureau (2014) issued guidance on further improving primary and secondary school students' comprehensive literacy. The guidance defined approaches toward learning as the relatively stable psychological characteristics of learners in the learning process, such as learning motivation, interest, habit, and ability. Other definitions of approaches toward learning include essential student characteristics that encourage them to adapt to life-long learning and future development (Lu, 2017). Peng (2004) referred to approaches to learning as "the way for students to establish a connection with the learning content during learning period" (p. 75), which is one of the factors that affect how students achieve academically and obtain study skills (Cutolo & Rochford, 2007; Kassab, Al-Shafei, Salem, & Otoom, 2015). Numerous studies have indicated that approaches toward learning were strongly related to students' academic development and had positive impacts on their learning outcomes (e.g., Angus, 2003; Cutolo & Rochford, 2007; Denton & West, 2002; Li, 2019; McGinnis, 2009).

2.3. Framework of approaches toward learning

Approaches toward learning was considered to be a complex system with multiple levels and aspects (e.g., Ge & Yang, 1997; Lu, 2017). According to Early Learning and Development Benchmarks in Washington State from 2005, there are five dimensions of students' approaches toward learning: curiosity, interest, initiative, persistence and attention, reflection, and interpretation (Kagan & Kauerz, 2012). The High/Scope Educational Research Foundation in Michigan, sorted students' approaches toward learning into the following six aspects: initiative, planning, participation, problem solving, use of resources, and reflection (Schweinhart, Berruetaclement, Barnett, Epstein, & Weikart, 1985; Schweinhart, 1993; Schweinhart & Weikart, 1997).

Studies with Chinese students suggest that approaches toward learning are multidimensional. Zheng (1996) classified approaches toward learning into learning motivation, learning habits, and learning methods. Peng (2004) classified approaches toward learning into learning motivation, learning tendency, learning monitoring, learning strategies, and learning ability. Lu (2017) reported six dimensions of approaches toward learning: (a) learning cognition and experience; (b) learning motivation; (c) learning ability and method; (d) learning persistence; and (e) learning outcomes. After integrating the definition and structure of approaches toward learning from domestic and foreign research, this study measures students' approaches toward learning from three aspects: self-confidence in learning, learning interest, and study habits.

2.3.1. Self-confidence in learning

Self-confidence in learning in the current study is defined as students' positive reactions towards their completion of learning tasks and the achievement of learning goals (Xiu, 2009). Studies showed that students who gained more learning confidence scored higher academically, especially when teachers adopted encouraging teaching strategies (Zhong, 2016).

2.3.2. Learning interest

Learning interest is defined as individuals' conscious tendency to try to know something and engage in a certain learning activity (Renninger, Hidi, & Krapp, 1992). Learning interest is the driving force in the learning process; students who have a higher interest in learning can engage more deeply in learning (Yan, 2015).

2.3.3. Study habits

Study habits can be described as the adopted strategy and manner a student plans in his/her private learning to attain mastery of one or more subjects (Capuno et al., 2019; Memiş & Kandemir, 2019). Having good study habits means using suitable learning strategies, which improves students' learning efficiency, thus helping students obtain success and produce better learning results (Capuno, et al., 2019; Ogbodo, 2010).

2.4. Impacts of social economic status (SES) and gender

Researchers have identified significant differences in learning outcomes related to students' gender and social economic status (SES) (e.g., McNeal, 2012; Sojourner & Kushner, 1997). Many studies indicated that SES may positively or negatively predict parental involvement and learning outcomes (Merola, 2005). Studies also suggest differences between boys and girls in learning performance (e.g., Ma, Du, Hau, & Liu, 2018). As a result, the possible effects of SES and gender on learning outcomes were controlled in this study when examining the relationship between approaches toward learning and academic achievement.

The current study explores the relationship between approaches toward learning and academic achievement and answers the following research questions:

1. Is there a significant relationship between dimensions of approaches toward learning and students' academic achievement?
2. How do dimensions of approaches toward learning predict academic achievement?
3. Are there differences in learning outcomes among students with various levels of self-confidence in learning, learning interest, and study habits when their SES and gender are the same?

3. METHODS

3.1. Participants

A total of 14,021 eleventh graders from an eastern province in Mainland China participated in the current study. A stratified cluster random sampling was employed, through which 100 schools from the 17 cities in the province were randomly selected to represent the student population in the province. All selected schools agreed to participate in the study. Due to the school support, the response rate was 100%. Table 1 shows detailed demographic information of the participants.

Table 1.
Descriptive Statistics of Demographic Information.

Demographic Variables	N	Percentage (%)
Gender		
Males	6794	46.3
Females	7527	53.7
Birthplace		
Rural	6105	44.3
Suburban	4637	33.6
Urban	3048	22.1

3.2. Instruments

3.2.1. Self-confidence in learning

The Self-Confidence in Learning scale was adapted from PISA 2006 (Organization of Economic Co-Operation and Development [OECD], 2009) and is intended to measure students' self-confidence in learning with three items. For example, one item was "I believe I can do well in the exam". Students were asked to respond to three items using a four-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). The Cronbach's alpha of responses to this scale was .74.

3.2.2. Learning interests

The Learning Interest Scale was developed by PISA 2012 (OECD, 2013) with the purpose of testing students' interest in courses and reading contents. Students were asked to respond to four items in each subject using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The internal consistency of the scales measured by Cronbach's alpha were .94, .96, .96, and .94 for learning interest of Chinese language, mathematics, English language, and overall learning interests, respectively.

3.2.3. Study habits

The Study Habits scale was adapted from Academic Adjustment Inventory (AAT). The scale has 12 items in three dimensions: plan for learning, style of listening, and style of reading. Students responded to the items using a five-point scale ranging from 1 (strongly disagree) to 5 (strongly agree), and higher scores represented better study habits in learning activities. Results showed high internal consistency based on Cronbach's alpha for each dimension and the whole scale: .93, .90, .94, and .97, respectively.

3.2.4. Academic achievements

Students' academic achievements were assessed by final examinations. To follow the Chinese National Curriculum Standards, three subject areas (mathematics, Chinese language, and English language) were included in this study. The three subject tests' total score represents students' academic achievements, with a mean of 249.90 and a standard deviation of 27.92.

3.2.5. Social economic status (SES)

We took an example from the method used in PISA 2009 (OECD, 2012) to evaluate SES in the current study. Students were asked to respond to several parental information questions, such as educational level, occupational status, and family possessions. A standardized score was then calculated from the highest degree of parental education, the highest occupational status of parents, and family belongings such as home educational resources.

3.3. Data collection and data analytic procedures

Preliminary analyses included the testing of the reliability of students' responses to the instruments. Descriptive statistics, including means and the standard deviations, are provided for the key variables. Pearson correlations and stepwise linear regressions were adopted to explore the relationship between approaches toward learning and academic achievements. An analysis of variance (ANOVA) was used to examine differences in academic achievements between the students in the top 25th percentile and those in the bottom 25th percentile based on self-reports on self-confidence in learning, learning interests, and study habits, when students' gender and SES were controlled. Effect sizes (η^2) were reported using Cohen's (1988) standards for small (.01), medium (.06), and large (.14) effect sizes.

4. RESULTS

Results of the Pearson correlation among variables are shown in Table 2. Students' dimensions of approaches toward learning were statistically significantly related to each other. Dimensions of approaches toward learning were also statistically significantly correlated with academic achievements. Table 3 describes the relationship between dimensions of approaches toward learning and academic achievements. Results of a stepwise linear regression indicated that self-confidence in learning, learning interests, and study

habits all significantly predicted students' academic achievements. The three variables each significantly contributed to the prediction of students' learning outcomes (Table 3). The change of the R-squared value was statistically significant at each step.

In order to further explore students' academic achievements by different dimensions of approaches toward learning, we classified students into the upper and lower 25% according to the scores of each dimension of approaches toward learning by. The top group represented students who were high in self-confidence in learning, learning interests, or possessed good study habits, and students in the bottom group were those with low self-confidence in learning, learning interest, or poor study habits.

Table 4 shows the results from the ANOVA of students' academic achievements by approaches toward learning (here refers to self-confidence in learning, learning interests and study habits). Significant differences were noted in three domains: students with higher self-confidence in learning (M = 255.25, SD = 26.02) had higher levels of academic achievements than those with lower self-confidence in learning (M = 243.43, SD = 29.78), F (1, 6779) = 226.68, $p < .001$, partial $\eta^2 = .03$ (small effect size). Students who possessed higher learning interests (M = 255.43, SD = 25.89) performed better on standardized tests than those with lower learning interests (M = 243.22, SD = 29.18), F (1, 6980) = 211.83, $p < .001$, partial $\eta^2 = .03$ (small effect size). Meanwhile, students who had better study habits (M = 253.50, SD = 27.15) also had higher academic achievements than those with poorer study habits (M = 245.92, SD = 28.38), F (1, 7643) = 84.74, $p < .001$, partial $\eta^2 = .01$ (small effect size).

Table 2.
Pearson Correlation Coefficients among Self-Confidence in Learning, Learning Interests, Study Habits, and Academic Achievements.

	SCL	LINT	STAB	TTS
SCL	1			
LINT	.63*	1		
STAB	.58*	.70*	1	
TTS	.17*	.18*	.15*	1
M	3.23	4.02	4.23	249.90
SD	0.66	0.85	0.75	27.92

Notes: (a) SCL = Self-confidence in learning; LINT = Learning interest; STAB = Study habit; TTS = Total score in three subjects = Academic achievement; (b) *$p < .001$.

Table 3.
Relationship between Academic Achievements and Self-Confidence in Learning, Learning Interests, Study Habits, and Academic Achievements.

Variable	B	SEB	β	R^2	ΔR^2
Step 1				.03*	
SCL	6.19	.32	.17*		
Step 2				.04*	.01*
SCL	3.11	.42	.09*		
LINT	4.29	.37	.14*		
Step 3				.06*	.02*
SCL	2.83	.43	.08*		
LINT	3.65	.44	.12*		
STAB	1.47	.54	.04*		

Notes. (a) SCL = Self-confidence in learning; LINT = Learning interest; STAB = Study habit; TTS = Total score in three subjects = Academic achievement; (b) *$p < .001$

Table 4.
Relationship between Academic Achievement (TTS) and Approaches to Learning.

	SCL			LINT			STAB		
Indicator	*SS*	*F*	*partial η2*	*SS*	*F*	*partial η2*	*SS*	*F*	*partial η2*
SES	74885.05	100.51*	.02	74734.07	101.40*	.01	82211.30	110.55*	.01
Gender	85990.14	115.42*	.02	103826.24	140.88*	.02	138916.85	186.80*	.02
Approaches	168885.60	226.68*	.03	156121.73	211.83*	.03	63017.75	84.74*	.01

Notes. (a) SCL = Self-confidence in learning; LINT = Learning interest; STAB = Study habit; TTS = Total score in three subjects = Academic achievement; (b) *$p < .001$.

5. CONCLUSION AND DISCUSSION

The study was designed to explore the relationship between approaches toward learning and students' academic achievements for Chinese high school students. Results showed that the dimensions of approaches toward learning (self-confidence in learning, learning interest, and study habits) were all significantly related to students' academic achievements (Research Question One). Our findings are consistent with those from previous studies (Cutolo & Rochford, 2007; Denton & West, 2002; Li, 2019; Kassab et al., 2015) in confirming the positive relationship between approaches toward learning and academic achievement. Our study contributed to the literature by showing evidence that each of the three dimensions of approaches toward learning (i.e., self-confidence in learning, learning interests, and study habits) significantly predicted students' academic achievements (Research Question Two). Moreover, Research Question Three was also answered with statistically significant differences in students' learning outcomes between various levels of self-confidence in learning, learning interests, and study habits, which echoed previous research (Chang, & Cheng, 2008; Kaur & Pathania, 2015; Xiu, 2009; Zhou, 2016).

Approaches toward learning is of great importance to students' academic development (Hugener et al., 2009). It can reflect students' confidence, interest, and other attitudes or behaviors in learning. Lu (2017) demonstrated that approaches toward learning is one of the most profound psychological characteristics that learners should have to contribute to their academic success. Poor learning outcomes are largely related to the absence of learning quality (Peng, 2004). Students with good approaches toward learning tend to show high interests and confidence in the learning process and have relatively viable study habits. They are interested in learning, believe that they are capable of learning, and regard learning as a pleasant behavior.

Attitude and cognition fosters a stable automatic learning behavior through better (Feng, 2002). In order to improve students' academic performance, educators should put more effort into helping students cultivate learning confidence (Li, 2019). Students can learn in a better way when they acquire interesting learning contents (Renninger et al., 1992), so it is also important for educators to help students develop interests in learning. Finally, classroom teachers should guide students in fostering good study habits and establish appropriate plans for learning (including listening to the teachers, reading, and reviewing the contents).

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