INFLUENCE OF LEARNING SELF-EFFICACY OF CHINESE VOCATIONAL COLLEGE STUDENTS ON LEARNED HELPLESSNESS: MEDIATING ROLE OF LEARNING BURNOUT AND MODERATING ROLE OF SOCIAL SUPPORT

By

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ABSTRACT

The aim of this study is to discuss the relationship among academic self-efficacy, learning burnout, social support and learned helplessness of vocational college students, and to explore the mediating role of learning burnout and the moderating role of social support. 1,067 students from five vocational colleges in Henan Province were selected as the samples by convenient sampling in this study, and conducted for questionnaires with acdemic self-efficacy scale, perceived social support scale, learning burnout scale and learned helplessness scale. And by statistically analyzing the valid data of this study with SPSS24.0 and AMOS22.0, the conclusions were drawn as the following: 1) Different variables have significant differences in influencing learning burnout, social support, and learned helplessness; 2) The acdemic self-efficacy of Chinese vocational college students has a significant negative influence on the learned helplessness; 3) The acdemic self-efficacy of Chinese vocational students has a significant negative impact on the learning burnout;

4) The learning burnout of Chinese vocational college students has a significant positive impact on the learned helplessness; 5) The learning burnout of Chinese vocational students can mediate acdemic self-efficacy in influencing learned helplessness; 6) The social support of Chinese vocational students can regulate acdemic self-efficacy in influencing learned helplessness. Relevant suggestions were proposed based on the research results, and expected to provide reference for future teaching and the work of mental health counseling.

Keywords: Academic Self-Efficacy; Learned Helplessness; Vocational College Students; Mediating Role; Moderation Role

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CHAPTER 1

INTRODUCTION

The education and growth of vocational college students are closely related to the future of China, so their status in learning and mental health, especially the negative psychology generated in study such as learning burnout and learned helplessness, are increasingly valued by the society and the education circle (Zhou & Qiu, 2008). In order to improve their psychological quality and learning quality, this study aims to understand the mediating role of learning burnout between acdemic self-efficacy and learned helplessness of vocational college students, and to explore the moderating role of social support between acdemic self-efficacy and learned helplessness of vocational college students, by researching the impact of acdemic self-efficacy on the learned helplessness of vocational college students in Henan Province, China. Based on the empirical analysis, recommendations were made after discussion. This chapter is divided into five sections, the first section is the research background and motivation, the second section is the research purposes and issues, the third section is the term interpretation, the fourth section is the research significance, and the fifth section is the research innovation.

1.1 Research Background and Motivation

Vocational education is the secret weapon in promoting the national

economy (Wang, Huang, & Tang, 2007), and vocational college education is an important component of higher education (Li, 2006). In recent years, the scale of vocational college education has been expanding, and the number of vocational colleges has been increasing year by year. The *National Statistical Report on Education Development in 2017* shows that the overall number of registered students in higher education has reached 37.79 million, and the gross enrollment rate of higher education reached 45.7% in China. In addition, there are 2,631 colleges and universities in the country, including 1,243 undergraduate colleges and 1,388 vocational (junior) colleges, which are respectively 6 and 29 more than the last year (Ministry of Education, 2018). Similarly, the scale of vocational colleges in Henan Province of China is also expanding. According to the *Statistical Report on Education Development in Henan Province in 2018*, there are 140 higher education institutions in the province, including 83 vocational (junior) colleges. The average number has reached 15,399 in every higher education institution, and that has reached 9,043 in every vocational (junior) college (Henan Provincial Department of Education, 2019). It can be seen that vocational colleges are an important part of Henan colleges and universities, that improving vocational education is one of the major measures to promote the economic development of Henan Province, and that vocational education undertakes the responsibility to cultivate high-quality workers and talents with specialized skills (Liu, 2010). Therefore, the quality cultivation of vocational college students in Henan Province should be concerned and valued by the circles.

However, with the continous expanding of enrollment scale and number, the problems in vocational college education are increasingly apparent. Learned helplessness is one of the big problems that have long plagued the education circle,

and also a realistic problem we have to face in vocational college education (Tan & Ding, 2011; Zhou, 2016). If we take improper disposal, it will become one of the influencing factors of high-quality talent training in vocational college education. Therefore, the status in learning and mental health of vocational college students are more and more concerned by the society and educators (Cui, 2013; Jia, Wang, & Jing, 2014; Ma & Ma, 2018; Zheng, 2013; Maslach & Jackson, 2013). Learned helplessness is a negative psychological state, that is, an individual fails to change after many tries when he experiences many difficulties in living or learning and thus believes that he will not succeed regardless of his efforts (Abramson, Seligman, & Teasdale, 1978). Unfortunately learned helplessness in the learning process has been widespread among college students (Sun & Xiao, 2011; Zheng, 2013). And no matter from real-life observations or investigations, vocational college students is the representative group with learned helplessness (Qian & Wang, 2015; Zhou & Cai, 2015). Most of the vocational college students are with a poor foundation in learning and the failure of college entrance examination. Some of them might have a strong intention to study when they entered colleges. However, due to the poor foundation in knowledge and the weak ability in learning, they can't follow teachers in the class, do homework alone, and get good grades, thus feeling that their efforts are disproportionate to their progress. The academic failure constantly frustrates their self-confidence, so they gradually form the felling of powerlessness and helplessness, and finally give up all the efforts. Over time, learned helplessness is inevitable (Cui, 2013; Ji, 2010). However, learned helplessness will eventually cause more serious negative consequences for individuals. Nolen, Girgus and Seligman (1986) found that long-term learned helplessness increases the incidence of depression in individuals.

It's pointed out in more research that learned helplessness is an important cause for test anxiety (Akca, 2011). Hen and Goroshit (2014) also find that students with severe learned helplessness will develop a negative mentality such as self-abandonment. The psychological discomfort brought by learned helplessness will make college students in adolescence feel confused, even spiritual empty, pessimistic, and ultimately form an incorrect outlook on life and values (Jiang & Yang, 2019). Meng (2010) also pointed out that students who have long-term learned helplessness often lose courage to fight and give up all efforts in study and life. Once the vocational college students acquired learned helplessness, they will easily fall into a vicious circle, becoming more passive and inefficient if the students are not able to adjust and effectively intervene in time (Cui, 2013). Therefore, combined with the above background and the consequences of learned helplessness, the learned helplessness needs to be highly valued by the education circle, and the related analysis in its influence factors, formation process and mitigation factors is also worthy of further conduction.

The previous studies of learned helplessness are quite rich, but mostly for social adults, ordinary college students, primary and middle school students (Chen, 2012; Jiang, 2018; Peng, 2015; Wang, 2014; Donald, Liu, Corwin, Verceles, McCurdy, Pate, Davis, & Netzer, 2012; Seligman, 2001; Sorrenti, Filippello, Costa, & Buzzai, 2015). However, there is very little research on the learned helplessness of vocational college students. Nowadays, learned helplessness is becoming increasingly severe in the vocational college students (Cui, 2013; Ji, 2010), so there is great need to analyze and study the influencing factors of learned helplessness in vocational college students. The reasons for students' learned helplessness are complex and diverse, including individual's internal and external factors (Weiner, 1974). Looking

back at the previous related research on learned helplessness, it can be found that many studies focus on the influence of parental attachment on learned helplessness (Chen, 2012), the influence of teacher expectations on learned helplessness (Pi & Yan, 2010), the impact of occupational burnout on learned helplessness (Kumcagiz, Ersanli, & Alakus, 2014), the relationship between social support and learned helplessness (Peng, 2010; Diener & Dweck, 1980), the relationship between learned helplessness and depression (Nolen, Girgus, & Seligman, 1986), and the relationship between learned helplessness and test anxiety (Akca, 2011). In recent years, the study of learned helplessness has been paid more and more attention. Through the literature, it can be found that among the attribution factors that cause learned helplessness, acdemic self-efficacy is one of the important internal attribution factor for the individual (Jiang & Zheng, 2006), but the previous research rarely includes the influence of acdemic self-efficacy on learned helplessness for vocational college students; therefore, this study intends to explore how acdemic self-efficacy affects the learned helplessness in vocational college students in Henan Province, China.

Many previous studies mainly focus on the relationship between acdemic self-efficacy, learning burnout, social support, and learned helplessness, such as acdemic self-efficacy and learning burnout (Shi, Gao, & Shen, 2011; Zhou & Jiang, 2010), learning burnout and learned helplessness (Kumcagiz et al., 2014; Pompili, Innamorati, Narciso, Kotzalidis, Dominici, Talamo, & Tatarelli, 2010), social support and learned helplessness (Peng, 2010; Li & Li, 2014; Diener & Dweck, 1980). But there is no a certain study to detailly analyze how these four variables interact with each other and have an impact on the learned helplessness. Moreover, it is still a blank in the education circle to learn how acdemic self-efficacy affects learned helplessness

by the mediating role of learning burnout or the moderating role of social support in vocational college students. Therefore, this study intends to explore how the acdemic self-efficacy of vocational college students in Henan Province, China influences learned helplessness by learning burnout, and how the individual factor (self-efficacy) and external situational factor (social support) coordinate with each other and then interfere the impact of acdemic self-efficacy on learned helplessness through empirical research. This paper also explored the mechanism of acdemic self-efficacy influencing learned helplessness of vocational college students, so as to provide reference for practical teaching and mental health counseling in vocational colleges.

In summary, based on the blank of selecting vocational college students in Henan Province of China as study objects, and the blank that how acdemic self-efficacy has an impact on learned helplessness by the mediating role of learning burnout or the moderating role of social support in vocational college students, the research purposes and the research issues are targeted in this study.

1.2 Research Purposes and Issues

Based on the literature review, the shortcomings and blanks of the current research were sorted out in this dissertation. In order to enrich the further study of learned helplessness of vocational college students, there are four purposes in this study: the first is to select the students from five representative vocational colleges in Henan Province, China as research objects, to detect the differences of demographic variables (genders, grades, student origins, disciplines, only-child or not) among acdemic self-efficacy, learning burnout, social support, and learned helplessness; the second is to study the relationship between acdemic self-efficacy, learning burnout,

social support, and learned helplessness; the third is to test the mediating mechanism of learning burnout between acdemic self-efficacy and learned helplessness among Chinese vocational college students; the fourth is to test the moderating mechanism of social support between acdemic self-efficacy and learned helplessness in Chinese vocational college students.

Based on the above research purposes, the following six major issues are proposed to be further explored:

1. What are the differences of the variables (genders, grades, student origins, disciplines, only-child or not) in acdemic self-efficacy, learning burnout, social support, and learning helplessness?

2. What is the impact of acdemic self-efficacy on learned helplessness in Chinese vocational college students?

3. What is the impact of acdemic self-efficacy on learning burnout in Chinese vocational college students?

4. What is the impact of learning burnout on learned helplessness in Chinese vocational college students?

5. What is the mediating role learning burnout in acdemic self-efficacy and learned helplessness of Chinese vocational college students?

6. What is the moderating role of social support in acdemic self-efficacy and learned helplessness of Chinese vocational college students?

1.3 Term Explanation

One purpose of this study is to explore the relationship among acdemic self-efficacy, learning burnout, social support, and learned helplessness in vocational

college students. So, in order to make the definitions of the major variables clear, some terms are explained as follows:

1.3.1 Academic Self-Efficacy

Academic self-efficacy refers to the belief, judgment or subjective self-perception of an individual in completing a certain learning activity at what kind of levels before performing it (Bandura, 1993).

1.3.2 Learning Burnout

Learning burnout is a state generated during the learning process, in which students feel embarrassed about the future development, lack of interest and sense of accomplishment in the disciplines, but still have to face the performance assessment (Schaufeli, Martinez, Pinto, Salanova, & Bakker, 2002).

1.3.3 Social Support

Social support refers to the supports timely received from important individuals (including spouses, parents, relatives, friends or teachers) under special pressure or dilemma, such as emotional support, cognitional support, substantial support and companioning support, which can help the individuals adjust interaction with the environment, or achieve a balance among body, mind and spirit (Thoits, 1986).

1.3.4 Learned Helplessness

Learned helplessness is a state of depression and helplessness when an individual (human or animal) continues to suffer setbacks, feels powerless to everything, can’t change the result at all, and loses confidence in himself or itself (Seligman, 1975).

1.4 Research Significance

1.4.1 Theoretical Significance

Self-Efficacy and social support have always been the major research targets of Health Psychology. Scholars in various fields have carried out extensive research, accumulated rich results, and laid a foundation for future research (Huang & Zhang, 2010; Liu, Shi, Xing, & Peng, 2018; Zhou & Guo, 2006; Cobb, 1976; Russell, Benedek, Naifeh, Fullerton, Benevides, Ursano, & Cacciopo, 2016); however, these studies need to be strengthened in breadth and depth. At present, the research on the learned helplessness of Chinese vocational college students is still in its infancy. This study explored the relationship among acdemic self-efficacy, learning burnout, social support, and learning helplessness, further clarified the impact of acdemic self-efficacy on the learning helplessness of vocational college students, and discussed the mediating mechanism of learning burnout and social support for acdemic self-efficacy and learned helplessness. This not only complemented the current research in this field, but also enriched Bandura's (1977, 1986) Social Cognitive Theory. It also helps to enrich and improve the research in academic self-efficacy, learning burnout, social support and learned helplessness of vocational college students, and provides reference for further research.

1.4.2 Practical Significance

With the emphasis on vocational education and the increasing enrollment of vocational college students in China, learning burnout is becoming worse and worse in vocational college students (Sun & Xiao, 2011; Zheng, 2013), which seriously affect the talents cultivation in China vocational education (Ministry of Education, 2014). This study will reveal the current situation of learned helplessness

in Chinese vocational college students, which will help administrators, teachers and students in vocational colleges understand learned helplessness, and help them understand the need and urgency to eliminate learned helplessness, also help to ease the negative learning mentality of contemporary vocational college students, and help to formulate relevant education policies to improve students' mental health quality from the aspects of social support and self-efficacy. More attention should be paid to the psychological factors in learning and daily life of vocational college students, so that they can learn a good responding way and avoid the occurrence of learned helplessness. It will help administrators, teachers and students of vocational colleges recognize the importance of social support and acdemic self-efficacy cultivation, by studying the relationship between academic self-efficacy and learned helplessness in vocational college students and discussing the moderating roles of learning burnout and social support between acdemic self-efficacy and learned helplessness.

1.5 Research Innovation

1. Innovation on Research Objects

The current research on academic self-efficacy, learning burnout, social support, and learned helplessness is relatively rare for the vocational college students in Henan Province. Most of the research is on the learned helplessness for the vocational college students from other provinces or middle school students, undergraduate students (Cui, 2013; Jia, Wang, & Dai, 2014; Pi & Yan, 2010; Zheng, 2013). However, from the survey of learned helplessness and the study of internal influence factors, it is found that the learned helplessness is widespread in vocational college students and needs to be paid attention to (Qian & Wang, 2015; Zhou & Cai,

2015), and this is why the vocational college students in Henan Province, China were selected as the research objects for the exploration of learned helplessness and influencing factors in this study.

2. Innovation on Research Variables

In previous studies, the antecedents of learned helplessness are mostly family education (Gu, 2014), academic achievement (Wang & Zhang, 2013), personality (Wu, Zeng, Ma, Yan, & Xu, 2009), etc., but it rarely includes the feeling of academic self-efficacy on learned helplessness. Through literature review, it is found in this study that improving academic self-efficacy can reduce individual's learned helplessness (Yang, 2016; Shaw, Dzewaltowski, & McElroy, 1992). In addition, there are many related studies on the relationships between acdemic self-efficacy, learning burnout, social support, and learned helplessness in previous studies, such as acdemic self-efficacy and learning burnout (Shi, Gao, & Shen, 2011; Zhou & Jiang, 2010), learning burnout and learned helplessness (Kumcagiz et al., 2014; Pompili et al., 2010), social support and learned helplessness (Peng, 2010; Li & Li, 2014; Diener & Dweck, 1980). But there is no study to clearly analyze how these four variables interact and have an impact on the learned helplessness. According to the literature, it can be speculated that the studies are still blanks on the mechanism of learning burnout mediating acdemic self-efficacy and learned helplessness, and the mechanism of social support moderating acdemic self-efficacy and learned helplessness.

In summary, this chapter mainly introduces the research background of learned helplessness, including the background of realistic research and the background of theoretical research. The shortcomings and vacancies of previous

studies are sorted out, and the necessity of studying learned helplessness of vocational college students from the perspective of self-efficacy is clarifiey in this chapter. The purpose and issues of this research are put forward, and the theoretical significance and practical significance in this research are analyzed; at the same time, the research innovations are produced, and the previous research objects, such as the primary and secondary school students, social adults or ordinary college students, are replaced by the vocational college students, which is a breakthrough in research objects; variable innovation mainly includes an introduction of a new antecedent variable—acdemic self-efficacy and two novel mediating and moderating variables, so as to discuss how the four variables of acdemic self-efficacy, learning burnout, social support, and learned helplessness interact with each other and have an impact on learned helplessness.

CHAPTER 2

LITERATURE REVIEW

Relevant literatures of the variables are collected for depth discussion, including acdemic self-efficacy, learning burnout, social support and learned helplessness, and Self-Efficacy Theory is adopted as the theoretical basis of this research. This chapter is divided into six sections. The first section is the theoretical basis, the second section is the related research on acdemic self-efficacy, the third section is the related research on learning burnout, the fourth section is the related research on social support, the fifth section is the relevant research on learned helplessness, the sixth section is the research on the interaction of academic self-efficacy, learning burnout, social support and learned helpless.

2.1 Theoretical Basis

This study is based on the Theory of Reciprocal Determinism in Bandura's (1977, 1986) Social Cognitive Theory, and the foundation of this theory is the ternary interaction of individual factors, behavioral factors, and environmental factors. Now it has been widely applied in education, human resources, career planning, organization and management, clinical nursing, mental health and other fields (Fang, 2013; Zhang, 2015; Zhou & Guo, 2006; Zhang, Yilmaz, Ören, Madey, & Sierhuis, 2012).

Bandura (1977, 1986) pointed out in self-efficacy developed from

Reciprocal Determinism that individual's self-efficacy is the primary factor affecting behavior. In learning process, the self-efficacy generated by individuals have an impact on learning behavior, indicating that in the learning process of vocational college students, acdemic self-efficacy has a direct impact on learning burnout. Fan (2007) pointed out that, as a belief in self-operating ability, individual's self-efficacy is not only a direct factor in determining individual behavior, but also the most direct factor affecting the individual's thinking mode and the individual's emotional response to stress. That is, the self-efficacy generated in the individual's learning process not only affects the learning behavior (such as learning burnout), but also affects the negative emotions or mental reactions (such as learned helplessness). Bandura (1977, 1986) divided self-efficacy into two parts: self-efficacy expectation and outcome expectation (as shown in Figure 2.1). Efficacy expectation refers to the degree of individual's belief in completing his task, a disciplineive judgment of his behavior; outcome expectation refers to an individual's prediction on a behavior leading to a certain result, and it depends on efficacy expectation to a great extent on the individual's behavior mechanism. That is, the level of efficacy determines the individual's different expectations on behavior or outcome, and it can influence the psychological process in executing an activity by mediating the motivation level (Gao, 2000). According to this, in the process of learning, self-efficacy, as the essence of the individual's belief and the individual factor of Social Cognitive Theory, affects the outcomes (such as learned helplessness) of emotional reactions or mental reactions by the behaviors (such as learning burnout) in completing tasks. Therefore, a research structure is constructed in this study in which individual's acdemic self-efficacy affects learned helplessness through learning burnout.

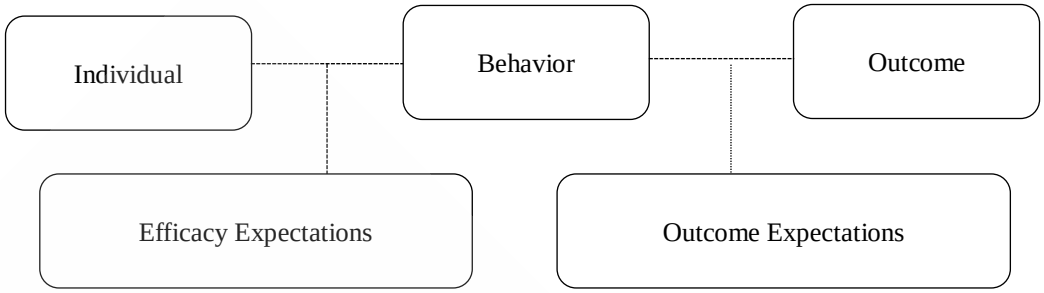

Figure 2.1 Structure Diagram of Efficacy Expectation and Outcome Expectation

Source: Bandura (1977, 1986)

According to Bandura's (1977, 1986) Reciprocal Determinism Theory, psychological function is the continuous interaction between the three factors of environment, individual and behavior from the perspective of social learning. And not only the influence on any factor comes from any other single factor, but the influence may also happen simultaneously among the three factors. In addition, behavior is the outcome of interactions between individual and environment factors. In other words, it is a process where environment interacts with individual's cognition, and thus affects the psychological behavior (Yang, 2006). Bandura (1977, 1986) points out in the Social Persuasion Theory that the incentives or praises from the social system composed of important others around the individuals can help the individuals put more effort and perseverance to complete the task when they encounter difficulties. Especially when the individuals feel struggling or doubt themselves during the completion of the task, the persuasion effect of the social system becomes more apparent. As a result, under the interaction of self-efficacy with the support of important others around the individuals, their self-confidence continues to increase, and a positive psychological state is established. Therefore, in completing the learning task, the support like speech encouragement from important others (family, teachers

or classmates, etc.) is more conducive to the determination of the students to continue to complete tasks when facing learning difficulties (Zhou & Guo, 2006). According to Bandura's (1977, 1986) Interaction Theory of Social Cognitive Theory, the support of important others (family, teachers, classmates, etc.) around the individuals, the environmental factor, interacts with self-efficacy, the essence of individual belief, and the outcome will have an impact on the individual's mental state (such as learned helplessness). Therefore, a structure is constructed in this study that individual's social support can regulate the influence of acdemic self-efficacy on learned helplessness.

2.2 Related Research on Acdemic Self-Efficacy

Self-Efficacy is a concept in Bandura's (1977, 1986) Social Learning Theory. When an individual wants to perform a particular behavior, the individual will first make a judgement whether he has the ability to complete the task based on personal factors and environmental factors. For students, acdemic self-efficacy has become the most direct factor in determining individual behavior, ways of thinking, and emotional responses in stressful situations (Fan, 2007). The definition of acdemic self-efficacy, related theories, measurement tools, and related demographic variables are enrolled in this section for further discussion.

2.2.1 Definition of Acdemic Self-Efficacy

Bandura (1986, 1997) defined Self-Efficacy as the individual's comprehensive judgment and perception on his abilities to perform a task based on the individual and environmental factors, which is a disciplineive judgment of self-ability. Pintrich and Schunk (2002) apply self-efficacy in learning contexts to

define academic self-efficacy. He points out that acdemic self-efficacy means that students assess their abilities in completing the learning tasks in class or after class. Bian (2004) believes that acdemic self-efficacy is the application of individual self-efficacy in learning. Huang (2012) defines acdemic self-efficacy as the students' disciplineive judgment on their learning abilities. Huang (2012) gives definitions from the perspective of cognition. He believes that acdemic self-efficacy is an individual's ability to evaluate, judge, and predict his actions and successful completion of certain behaviors. Hong, Huang and Qiu (2014) define academic self-efficacy as the belief to achieve certain tasks under the management of individuals' knowledge, skills and abilities.

Therefore, according to Pintrich and Schunk's (2002) perspective on self-assessment, this study defines acdemic self-efficacy as vocational college students' ability to subjectively assess their performance in completing the learning tasks, or as the self-assessment to learning outcome.

2.2.2 Relevant Theory of Acdemic Self-Efficacy

Acdemic self-efficacy is originated from Bandura's (1977) Theory of Self-Efficacy (Gao, 2000). Bandura (1977) pointed out that the factors influencing the continuity or change of an individual's behavior include efficacy expectation and outcome expectation. Efficacy expectation is a subjective assessment on an individual's ability and successful completion in a particular task. Efficacy expectation has an effect on the whole process of accomplishing the behavior, including the choice of certain behaviors, how much effort the individual is willing to pay, and the degree of willingness to persist when facing setbacks; outcome expectation is the judgment on the outcome of behavior, in other words, the individual

believes his ability in performing a task and achieving a predetermined outcome. The individual will put more enthusiasm into the task when he is confident that his behavior can achieve the desired outcome. Bandura (1986) cross-contrasted the efficacy expectations with the outcome expectations, and divided them into four modes. First, when individuals are both high in efficacy expectations and outcome expectations, they will behave confidently and take positive actions. Second, when individuals have high negative efficacy expectations on behavioral outcomes, they will be dissatisfied and try to change the environment by protests. Third, when individuals have no confidence in ability, and the results are negative, the individuals will be more willing to abandon and face the task with indifference. Fourth, when the individual's expectation outcome is positive and the efficacy expectation is negative, the individual will belittle himself and suffer depression, frustration, and even inferiority. Therefore, both efficacy expectations and outcome expectations can predict performance, and self-efficacy is an important determinant on individual's behavioral outcomes.

Bandura (1986) points out that the main sources of individual's self-efficacy include mastery experiences, vicarious experiences, social persuation, physiological and emotional states. The explanations of the four sources are as the following:

1. Mastery Experience

Mastery experience, also known as Enactive Attainment, refers to the achievement experience gained by an individual or the successful execution in an activity. Bandura (1995) believes that self-efficacy must be obtained through hard work. If success is too easy to achieve, it will lead to a negligent mentality and reduce

frustration tolerance. When encountering big difficulties, it will be more likely to lead to failure. In other words, successful learning experience can improve students' confidence in self-ability, while repeated and failed experience will cause individuals' self-doubt, thus reducing self-efficacy. Bandura (1995) also believes that mastery experience is the most influential and reliable source of individual's self-efficacy.

2. Vicarious Experience

Vicarious experience means that when others with similar abilities or backgrounds succeed in an activity, the observer believes that he or she will have the same success in similar activities. The learning experience based on the example achievement of others is also called alternative experience (Gao, 2000). Bandura (1995) pointes out that human belief shouldn't be completely obtained from self-experience; they can also be obtained from human relationships such as brothers and sisters, family, teachers, peers and various living environments. Individuals can gain self-efficacy by emulating the experience of people who are comparable to their conditions and abilities. In the learning process, students will look for people who have similar abilities with them (such as teachers, peers, or family members) to gain self-efficacy by observing and emulating those people. Therefore, when students observe that their peers who are similar in ability with them have gained successful experience, their self-confidence will increase; on the contrary, if the peers fail for some reason, it will affect the students' belief in their self-ability too, thus reducing the extent to persist.

3. Social Persuasion

Social persuasion means that individuals gain confidence through the encouragement and support from important others, and their ability is properly

exerted in pursuing goals. This is also one of the sources of self-efficacy, also known as Verbal Persuasion. Bandura (1995) argues that appropriate encouragement will motivate individuals to engage with self-doubt and then trigger effort motivation to pursue success. Conversely, if the encouragement causes an unreasonable expectation, it may lead to the failure of the task, thereby reducing the individual's effectiveness perception. Therefore, in the process of learning, important others around the students (such as parents, teachers or classmates) should give positive verbal encouragement and support, enhance students' confidence, and relieve self-doubt, so that the students' ability is appropriately performed and a strong sense of self-efficacy is produced in the completion of task.

4. Physiological and Emotional States

Physiological state refers that individuals judge their abilities based on their physical or emotional states. Bandura (1995) argues that in the process of learning, being in an anxious or excessively tired state will reduce an individuals' judgment to their ability, thus holding more pessimistic views on their performance; on the contrary, when the physiology and emotions are in balance, the individuals' self-efficacy will be higher, and there will be a stronger willingness to learn. Therefore, helping students to establish positive learning emotions and maintain a balanced physiological and psychological state has a positive effect on enhancing acdemic self-efficacy.

In addition, Bandura (1977, 1986) pointes out that in facing problems, individuals' different responses may be affected by self-efficacy, that is, when individuals encounter difficulties or setbacks in the process of completing tasks, individuals' self-efficacy will determine the extent to work hard and the tolerance to

overcome difficulties (Bandura, 1977, 1986). As far as individuals are concerned, self-efficacy is the medium for changing behaviors. Its role and impact are mainly shown in the following three aspects:

1. Behavior of Choice

Behavior of Choice refers that when individuals face determinations in lives, those with high self-efficacy tend to choose positive behaviors such as facing and solving problems. Conversely, those who are low in self-efficacy tend to choose negative behaviors like evading problems and giving up resolution. In the process of learning, when individuals encounter difficulties or setbacks, those with stronger self-efficacy tend to choose learning behaviors like being brave to overcome difficulties. Conversely, those with weaker self-efficacy tend to choose to evade learning and give up learning, ultimately leading to negative learning behaviors such as learning burnout.

2. Effort and Persistence

Effort and persistence refer that when individuals encounter problems or risks, those with high self-efficacy will pay more effort than those with low self-efficacy, and their intention to persis efforts will be stronger.

3. Thinking Patterns and Emotional Responses

Thinking patterns and emotional responses refer to the degree of self-efficacy affecting the patterns of thinking and emotional response during the interaction between individuals and the environment. If an individual often feels that he is not able to cope with the changes in his environment and encounters problems, he will find it difficult to cope with stress, showing depression and other emotions; those with high self-efficacy will have a positive belief in the face of adversity, and

their anxiety degree will also be lower; when facing with failure, the individuals with high self-efficacy will attribute it to “insufficient effort”, while those with low self-efficacy attribute it to “insufficient ability”.

In summary, according to the Theory of Acdemic Self-Efficacy, individual’s self-efficacy is closely related to the support of important others, and the level of self-efficacy can also directly influence the behavior choices (such as learning burnout) of an individual in performing tasks. self-efficacy also affects the emotional process of the individual in completing the learning task, especially affecting the individual’s willingness to persist in facing learning setbacks or difficulties which will ultimately lead to a sense of hopelessness in learning (such as learning helplessness).

2.2.3 Tools for Measuring Acdemic Self-Efficacy

In recent years, many measurement tools have been developped for self-efficacy. Based on different situations and objects, researchers developed many self-efficacy scales with different dimensions such as single dimension, multi-directional dimension, etc. (Gu, Meng, Fan, 2014). The following is a discussion on the frequently used self-efficacy scales:

1. General Self-Efficacy Scale (Single Dimension)

The General Self-Efficacy Scale (GSES) compiled by Schwarzer, Mueller and Greenglass (1999) is always used for the individual’s self measurement in dealing with various environmental conditions or facing new conditions in completing tasks, but it is generally used for adults. The scale belongs to one of the single dimension scales, and has been improved from 20 items to 10 items. It adopts 4 points to score, 1 point refers to “very inconsistent” and 4 points means “very consistent”. Higher score sugests higher self-efficacy. Cronbach’s α coefficient is 0.86 and split-half reliability

is 0.85 in this scale (Schwarzer, Mueller, & Greenglass, 1999), indicating that the scale is qualified as a measure tool of efficacy. Thus, the scale has been translated into at least 25 languages for worldwide use (Zhou, Zhao, Zhang, & Xiong, 2012; Scholz, Doña, Sud, & Schwarzer, 2002).

2. New General Self-Efficacy Scale (NGSS, Single Dimension)

New General Self-Efficacy Scale (NGSS) is developed by Chen, Gully and Eden (2001) for the students majored in psychology to assess their self-ability in learning tasks, with 316 undergraduate students at Central Atlantic University in the United States as research objects. The scale belongs to one of the single dimension scales, including 8 items and using 5 points to score. 1 point means "very disagreeable", 5 points means "very agreeable", and higher score sugests higher self-efficacy. The investigators conducted three tests on the disciplines during the semester (the first day of the psychology course, the middle of the course, and the last day of the course). The Cronbach's α coefficient of the scale is 0.87 and the test-retest reliability are 0.88 and 0.85 (Chen, Gully, & Eden, 2001). The scale has been used as a measurement and analysis tool for individual self-efficacy and has been proven to be of good reliability and validity (Feng, & Chen, 2012; Alexopoulos & Asimakopoulou, 2009).

3. Social Self-Efficacy Scale for Students (SSESS, Multi Dimension)

Fan and Mak (1998) developed Social Self-Efficacy Scale for Students (SSESS) on the basis of Social Subscale (Solberg, Brien, Villareal, Kennel, & Davis, 1993) and Social Interaction Scale (Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, & Rogers, 1982) in College Students' Self-Efficacy Scale, which are used to measure the level of social confidence and assess the self-ability in college students'

social interactions. The scale, which belongs to one of the multi dimension scales, includes 20 items and four dimensions: lack of social difficulties, social confidence, sharing interests, and active friendship building. It adopts 7 points to score, 1 point means "completely disagreeable", and 7 points means "completely agreeable". Higher score means higher social self-efficacy. The internal consistency reliability coefficient of the scale is 0.85 (Fan & Mak, 1998), indicating that the scale has a high degree of reliability.

In summary, by comparing the above three self-efficacy measurement scales, it is found that the research objects of the GSES is adults, which is consistent with the research objects (vocational college students) in this study; GSES scale has been translated into at least 25 languages and is widely used in the world; and from the reliability and validity of measurement tools, GSES has an internal reliability of 0.86, indicating that the scale is of good reliability. Therefore, combining all the advantages of GSES and the conformity degree with this study, GSES compiled by Schwarzer, Mueller and Greenglass (1999) is adopted in this study as a tool for the measurement of acdemic self-efficacy.

2.2.4 Related Research on Acdemic Self-Efficacy

It is found in many studies that acdemic self-efficacy is easily influenced by individual's background variables (such as gender, grade, student-origin, only child or not) (Huang, 2012; Huang & Xu, 1999). Relevant studies on acdemic self-efficacy will be discussed in this study from the following aspects of gender, grade, student-origin, discipline, and only child or not:

1. Gender

In demographics, there are many gender-related studies on acdemic

self-efficacy, but each researcher has different findings. It is found in many studies that there is no significant difference in acdemic self-efficacy between genders (Hu & Xu, 2003; Liao, 2011; Hong, Huang, & Qiu, 2014; Ersanli, 2015); however, other studies found that male college students' academic self-efficacy is significantly higher than that of female college students (Wang & Miao, 2012; Li & Lu, 2014; Shkullaku, 2013). Zhang and Yuan (2004) find that the acdemic self-efficacy of female college students is significantly higher than that of male college students in the learning of foreign languages.

2. Grade

In the study of gender-related acdemic self-efficacy, researchers have different findings. There is no significant difference in acdemic self-efficacy between different grades (Hu & Xu, 2003; Wang & Miao, 2012; Hong, Huang, & Qiu, 2014; Li & Chen, 2012). Caprara, Vecchione, Alessandri, Gerbino and Barbaranelli (2011) found that higher grades always suggest higher self-efficacy. However, it's found in other studies that freshmen's self-efficacy scores are significantly higher than those of sophomores (Li & Lu, 2014; Wang, 2009). Zhang (2013) finds that there is difference in students' self-efficacy between different grades, and the freshmen's acdemic self-efficacy is significantly higher than that of other grades.

3. Discipline

In the discipline-related studies of academic self-efficacy, researchers have inconsistent findings. Wang and Miao (2012) found that there is no difference in academic self-efficacy of college students between different disciplines, which is consistent with the results of other researchers (Li & Chen, 2012; Zhang & Yuan, 2004); at the same time, there are also inconsistent findings. Zhang (2013) finds that

college students in science and engineering have higher academic self-efficacy than students in arts.

4. Student-Origin

In the student-origin related studies of acdemic self-efficacy, researchers also have inconsistent findings. Wang and Miao (2012) find that there is no urban-rural difference in college students' academic self-efficacy, which is consistent with the findings of Liao (2011), Li and Lu (2014). However, Li (2008) finds that rural students have a higher level of academic self-efficacy than urban students.

5. Single-Child or Not

In single-child or not ralated studies of acdemic self-efficacy, Liao (2011) finds that there is no difference on the level of acdemic self-efficacy whether an individual is single-child or not. This result is consistent with other studies (Zhang, 2013). Cai, Song and Zhao (2011) find that in interpersonal relationships, the level of self-efficacy of the single-child students is significantly lower than that of non-single-child students, and the same findings are also found in other studies (Li & Chen, 2012; Wang, 2009).

In summary, researchers have no consistency on the differences in acdemic self-efficacy between genders, grades and student-origins, which may be caused by the differences in specific areas and tasks. In addition, this difference may be also caused by the standard differences between adolescents and adults (Bong & Clark, 1999). In view of the difference in academic self-efficacy between different situations and disciplines, gender, grade, student-origin, discipline and single-child or not are included as the background variables in this study.

2.3 Relevant Research on Learning Burnout

2.3.1 Definition of Learning Burnout

Burnout is a concept put forward by American psychologist Freudenberg in the study of employee's work stress in the 1970s. It mainly refers to the negative influences brought by the long-term excessive work load of an individual, such as excessive physical and mental exhaustion, working inefficiency, cold attitude in getting along with others, and low job accomplishment (Freudenberger, 1974). Through further research, many researchers applied burnout research in the field of learning (Lian, Yang, & Wu, 2005; Schaufeli et al., 2002), and they gave different definitions of learning burnout from different perspectives. Schaufeli and other researchers (2002) believe that learning burnout is caused by the embarrassment about the future development, the lack of learning interest and accomplishment sense, and the must of facing tests. Tuominen and Salmela (2014) give an explanation from the learning mentality: learning burnout refers to a negative psychological state caused by students' continuous exhaustion to learning requirements, indifference to academic tasks, loss of interest, negative attitudes, and a sense of lacking accomplishment. Yang and Lian (2005) combined the learning performance of college students under the background of Chinese culture, and definited learning burnout as inappropriate behaviors caused by negative psychological manifestations such as frustration, tiredness, dissatisfaction, anxity, depression, indifference, confusion, weakness, and low self-esteem when facing learning pressure or lack of interest but having to learn. Wu, Dai, Wen and Cui (2010), from the psychological phenomenon of students, define it a negative psychological phenomenon that students experience energy exhaustion after a long period of learning pressure, gradually lose learning enthusiasm,

and hold negative attitudes to learning.

In summary, based on the actual research objects (vocational college students) and the definition of learning burnout from the perspective of learning status which is proposed by Schaufeli et al. (2002), in this study learning burnout is defined as the negative psychology such as depression, anxiety, apathy, powerlessness, etc., and the resulted burnout behaviors such as skipping classes, evading learning, and distraction in class for the lack of learning confidence or motivation but having to face the learning difficulties in vocational college students.

2.3.2 Relevant Theory of Learning Burnout

According to Maslach, Schaufeli and Leiter's (2001) theoretical model of vocational burnout, Cushman and West (2006) proposed a theoretical model of learning burnout process. The model includes students' learning resources (such as the support of teachers and classmates), individual characteristics, and the process of learning burnout, and illustrates the adverse effects of learning burnout on individuals or organizations (such as colleges). It is pointed out in the model that when learning resources (such as social support) cannot satisfy the learning task, the psychological traits of the individual will aggravate or inhibit the development of learning burnout. Individuals will be physically and psychologically exhausted and emotionally unstable; in order to face these changes, individuals will speed up the extraction of resources to meet task needs. However, increasing the consumption rate of resource can make individuals feel physical and emotional exhaustion and the decrease of accomplishment sense.

In summary, in the process of learning burnout, when an individual feels that his resources cannot meet the needs of the learning task, pressure will arise. In

order to cope with the demand, the individual will increase the speed of resource consumption, leading to the physical exhaustion, an indifferent attitude towards the people and things around, and a negative evaluation of himself, and other resulted consequences like the lack of self-efficacy, tendency to a negative attitude towards learning and even giving up in learning activities.

2.3.3 Measure Tools for Learning Burnout

In recent years, types of burnout measurement tools have been developed. Some frequently used burnout measurement tools are discussed in the following:

1. Oldenburg Burnout Inventory

The Oldenburg Burnout Inventory (OLBI) is developed by Demerouti, Bakker, Vardakou and Kantas (2003) based on the staff's job demands-resource (JD-R) model. This model focuses on two types of characteristics in the work. One is the job requirement, which refers to the psychological, emotional, and physiological requirements of the work. The second is the working resource, which refers to the resources that the work provides to the individual. Work requirements require sustained physical or psychological efforts, but they can easily cause both physical and psychological failure. The scale is divided into two dimensions: exhaustion and disengagement from work. The exhaustion dimension refers to the failure from long-term work stress. The disengagement from work dimension means keeping a distance from the work and having a negative attitude towards the work objects and contents. There are 15 items in OLBI, and this scale uses 4 points to score; 1 point means completely disagreeable, and 4 points mean completely agreeable. The internal consistency reliability of the two dimensions of OLBI is 0.73 and 0.83. The discriminant validity is good and has a correlation with MBI-GS of 0.74, indicating

that its convergence is good (Demerouti et al., 2003). It is often used for burnout measurement due to work or learning stress (Xu & Zhu, 2013; Reis, Xanthopoulou, & Tsaousis, 2015).

2. School Burnout Inventory (SBI)

Salmia-Aro and Näätänen (2005) developed School Burnout Inventory (SBI) based on the Bergen Burnout Indicator 15 (BBI-15) developed by Näätänen, Aro, Matthiesen and Salmela-Aro (2003). SBI is used to measure the degree of learning burnout in learning process. The scale consists of 10 items, including exhaustion of coursework (4 items), doubts about the meaning of schooling (3 items), and sense lack of schooling (3 items). Likert 6-point is used to score. 1 point means "complete disagreement" and 6 points represents "complete agreement". Higher score suggests higher learning burnout. The scale has been proven to be highly reliable by the developers' validation on the total scale and subscales (Salmela-Aro, Kiuru, Leskinen, & Nurmi, 2009).

3. Maslach Burnout Inventory-Student Survey

The Maslach Burnout Inventory-Student Survey (MBI-SS) is a learning burnout scale for college students, which is compiled by Schaufeli et al. (2002) based on the Maslach Burnoout Inventory-Human Services Survey (MBI-HSS). In compiling this scale, Schaufeli et al. (2002) collected 1,661 college students from Spain, Portugal and Netherlands as research objects. The scale is consisted of 15 items, including emotional exhaustion, negative attitude and low achievement. The scale adopts 7 points to score, 1 point refers to "strong disagreement", 7 points refers to "strong agreement", and 6 items in the low achievement dimension adopts negative scoring. Cronbach's α coefficients of the three subscales are 0.838, 0.844, and 0.875.

The scale has been widely used in academia and its good reliability and validity have been confirmed (Luo, Zhao, & Wang, 2014; Yavuz & Dogan, 2014).

In summary, MBI-SS compiled by Schaufeli et al. (2002) has been widely used by many researchers to measure the learning burnout of college students (Luo, Zhao, & Wang, 2014; Galán, Sanmartín, Polo, & Giner, 2011; Yavuz & Dogan, 2014). The research objects of this study are vocational college students, so the scale is suitable for measuring the learning burnout of college students.

2.3.4 Relevant Research on Learning Burnout

Relevant research of learning burnout on gender, grade, student origin, discipline, and single-child or not is explored in this study.

1. Gender

In demographics, there are many gender-related studies on learning burnout, but the researchers have different findings. Galán, Sanmartín, Polo and Giner (2011) found that there is no significant difference in learning burnout between genders, which is consistent with the findings of some researchers (Sun & Lu, 2014). However, other researchers have different findings. Song and Luo (2018) find that college students between different genders have significant differences in the scores of physical and psycological exhaustion in learning burnout, and female college students score higher than male college students. Salmela and Tynkkynen (2012) studied young people and find that gender has significant differences in learning burnout, and female students have a higher degree of learning burnout than male students. Jia et al. (2014) find that only the low achievements in learning burnout are significantly different in gender, and that of male students are significantly higher than the female students. Wu, Xie, Wu, and Yang (2016) find that the scores of learning burnout are

significantly different in terms of gender. And emotional exhaustion, scores of teachers and students, and total scores of learning burnout in male students are significantly higher than that in female students, which is consistent with the findings of other researchers (Xiong & Fang, 2017).

2. Grade

From the perspective of the grade characteristics of learning burnout, the researchers have different findings. Zhu (2009) argues that in the dimension of depression, the third-grade students were significantly higher than the first-grade and the second-grade students; however, no significant differences are found between the first-grade and the second-grade students. Sun and Lu (2014) believe that there are differences in the level of learning burnout between different grades. The level of learning burnout of the first-grade students is significantly higher than that of the fourth-grade students, and no significant differences are found between the other grades. Yang, Zhou, Zhang, Liu, and Wang (2014) find that the third-grade and the first-grade college students had lower levels of depression than the second-grade students in the study of learning burnout among normal college students. When Song and Luo (2018) collect college students as research objects, they find that students in the upper and lower grades have different discoveries in the dimensions of learning burnout. In the dimension of physical and mental exhaustion, the higher grade students are significantly higher than the lower grade students, while in the low achievement of learning burnout, the lower grade students are significantly higher than the higher grade students.

3. Discipline

From the perspective of discipline, the researchers have different findings.

Gao (2013) finds that the level of learning burnout in science is significantly higher than that in arts, and this result is consistent with some researchers (Yang, Gao, Li, Gong, Hu, & Wen, 2013). Song and Luo (2018) argue that students of different disciplines have different results in the dimensions of learning burnout. Among them, in the dimension of physical exhaustion and academic alienation, the mean score of students in arts is significantly higher than that of students in science, but in low achievement, the mean score of students in science is significantly higher than that of students in arts, and there is no significant difference in the mean scores between arts and science students in the overall burnout. Sun and Lu (2014) also believe that there is no significant difference in the level of learning burnout among college students in different disciplines. Zhao (2016) concludes that the students in science and engineering and the students of literature and history have significant differences in the academic alienation dimension in learning burnout, and the mean score of science and engineering students is significantly higher than that of literature and history students.

4. Student-Origin

Student-origin has different results in the related research on learning burnout. Xiong and Fang (2017) find that the learning enthusiasm of rural students is higher than that of urban students. In other words, the level of learning burnout of urban students is higher than that of rural students. This result is consistent with some researchers (Lu et al., 2016). Xiao and Xu (2011), when collecting vocational college students as research objects, find that there are significant differences in the student-oringin between emotional exhaustion and low personal achievement. Among them, students from rural areas are significantly lower than those in urban areas. In

the dimension of improper behaviors, there is no significant difference between the two student origins.

5. Single-Child or Not

Different results are also found in the related studies of learning burnout on the dimension of single-child or not. Zhao (2016) finds that in the dimension of emotional exhaustion, there is a significant difference between single-child and non-single-child, and the mean score of the non-single-child is significantly higher than that of the single-child. However, Jia et al. (2014) also uses vocational college students as the research objects, and find that there is a difference between the single-child and non-single-child in the overall level of learning burnout or its low depression and low achievement factors, the score of which are all higher in the single-child than that of the non-single-child.

In summary, researchers have no accordance on the differences of learning burnout in gender, grade, discipline, student-origin, and sigle-child or not dimensions. Therefore, the background variables are enrolled in this study for further analysis.

2.4 Research on Social Support

2.4.1 Definition of Social Support

The concept of social support stems from social cohesion in sociology (Durkheim, 1951). Since the 1970s, the study of social support has been paid attention to in sociology, medicine, psychology and other fields. Each scholar defines social support from different angles according to different backgrounds. Cassel (1976) argues that social support is that individuals are centered on primary groups such as families or schools, gaining more social support and ultimately gaining more social

opportunities; Thoit (1986) argues that social support means that when individuals are under special pressure or difficult circumstances, they timely receive various support from key personnel (such as spouses, parents, relatives, friends or teachers), such as emotional support, cognitive support, substantive support and companion support, which can help them interact with the environment, getting adjustment or balance among body, mind and spirit. By the 1980s, the concept of social support is introduced to China by Xiao and Yang (1987), who divided social support into three items including objective support (material support or direct service support) and disciplineive support (emotional support), and the individual's use of social support. Subsequently, Goodwin, Costa and Adonu (2004) define social support as a social interaction or social relationship, which can provide practical help or emotional dependence for individuals.

Therefore, based on Thoit's (1986) definition of social support, social support is defined in this study as the material or spiritual support which vocational college students receive from people (such as parents, teachers, classmates) who they have frequent contact with on their study and life during the learning process.

2.4.2 Related Theory of Social Support

When studying the brain intelligence of children, Vygotsky (1978) finds that what really need to be measured are not the ability that the child has possessed, but the performance and learning potential with the help of others. Therefore, he developed the Zone of Proximal Development (ZPD) and defined it as a psychological development distance, which is between the degree that the individual has solved the problem by himself and the degree that he solves the problem under adults' or peer's guidance. The dynamic distance is ZPD (Vygotsky, 1978). That is,

human beings have two levels of development: one level is that an individual exhibits when he or she completes a task without assistance from others, which is called actual development; the other is the development of an individual in completing a task with the assistance of important others around (teachers or peers), which is called potential development. The distance between the actual development and the potential development is the ZPD, and the ZPD theory is developed on the basis of that. Vygotsky (1978) believes that human learning is inseparable from the context of social and cultural contexts. The positive verbal communication between people is the key to creat a higher ladder. In addition, by observing individual interaction, it is believed that the support from higher-capacity peers to lower-capacity peers can benefit the development of learning and psychology of lower-capacity peers.

Therefore, ZPD theory believes that in the process of learning, vocational college students can achieve good physical and mental health through ZPD. In other words, individuals internalize the assistance of others (such as teachers' support) through social interaction and their own cognition, thinking and organization. The support provided by teachers is just like the construction of buildings, on the basis of which the ability of vocational college students is constantly supported and developed. The positive effects of physical and mental health and life adaptation are easy to generate in vocational college students receiving more social support.

2.4.3 Measurement Tools for Social Support

Regarding the dimensioning of social support, each researcher holds different views and roughly divides it into the following:

1. Perceived Social Support Scale (PSSS)

The scale is based on the Perceived Social Support Scale (PSSS) compiled

by Zimet, Dahlem and Farley (1988). The research objects are college students in this study and they have a close relationship with their classmates in life and study, so "friend support" is replaced with "student support" in this study. The scale includes twelve items and three dimensions such as family support (family support), student support (help from classmates when an individual is facing learning dilemma), and other supports (friends or relatives' company when an individual is in need). Each subscale contains four items, and the full scale has a total of twelve items, which are used to measure the degree of support from the family, friends, and other sources. Likert 7-point is used to score, with one point representing "strong disagreement" and seven points representing "strong agreement". The mean score of all items and the total score of social support are calculated, so as to reflect the degree of social support. The Cronbach's α coefficient of the original total scale is 0.88 (Zimet et al., 1988). The scale has been widely used by many researchers in papers published in core journals (Jiang, 2001; Salimi & Bozorgpour, 2012), indicating that the scale not only has good reliability, but also has wide applicability.

2. Social Support Rating Scale (SSRS)

The scale that Xiao (1994) compiles based on the actual situation of China contains ten items and three dimensions including objective support, disciplineive support and the use of support. Likert four-level scoring was used in the 1-4 and 8-10 questions; the fifth question is divided into four items for scoring; the sixth and the seventh questions are scored according to the source. The higher score suggests the higher level of social support the individual perceives. The Cronbach's α coefficient of the scale is 0.92, and the retest reliability after two months is 0.94, indicating that the scale is of good reliability (Xiao, 1994), which has been used by many researchers

in published papers (Yang, 2014; Wu & Liang, 2010).

3. Interpersonal Support Evaluation List (ISEL)

ISEL scale developed by Cohen and Wills (1985) contains 16 items, including substantive support, message support, emotional support and self-esteem. Likert 3-point is used to score in this study, with a total score of 48. Higher score suggests the higher level of social support, good internal consistency and good construct validity (Brookings & Bolton, 1988). This scale has been cited in many published papers (Crane & Constantino, 2003; Payne et al., 2012).

In summary, there are a variety of scales for measuring social support. The reliability and validity of the scales, the applicable groups, the application ranges, and the characteristics of the research objects (vocational college students) are all considered and compared, and the supports are mainly from family, teachers, and classmates, so the PSSS compiled by Zimet et al. (1988) is adopted in this study

2.4.4 Related Research on Social Support

The studies on gender, grade, student-origin, discipline, and single-child or not in social support will be discussed as the following:

1. Gender

In the gender-related research of social support in demographics, researchers have different findings. Yang (2014) finds that there is no significant difference in gender of the overall social support level, but female college students are significantly higher than male college students in terms of social support use. Wu and Liang (2010), when collecting junior college students as research objects, find that gender has significant differences in the overall level of social support and disciplineive support, and that female students score higher than male students, which

is consistent with other researchers (Huang & Li, 2014; Ma & Lin, 2006). Su, Li, Dong (2016) also find that there are significant differences on gender in college students-perceived social support, and the social support that female students perceived from family, friends and other sources are significantly higher than that of male students, which is consistent with the existing research results (Zhang, Zhang, & Li, 2015). In other words, female students have a higher awareness of social support from various resources in life than male students. When the research objects are vocational college students, Liu and Chen (2013) have different findings that there is no significant difference on gender in all dimensions of social support, which is consistent with some other researchers (Liu & Wang, 2018; Henry et al., 2019).

2. Grade

In demographics, Ma and Lin (2006) found that the social support levels of sophomores and juniors were significantly higher than that of freshmen in the relevant research on social support in different grades. When the research objects are college students, Sun and Lu (2014) find that there are significant differences in perceived social support in different grades, and the level of perceived social support of the third grade students is significantly higher than that of the first grade students. Liu and Chen (2013) find that there is no significant difference in the scores of friend support and other supports, but there are significant differences in family support; it is also found in the study that the level of family support for freshmen and sophomores are significantly higher than the level of family support for juniors, which is consistent with other researchers' (Jackson, Tucker, & Herman, 2007). However, Huang and Li (2014) find that grades have no significant difference in perceived social support when the research objects are college students (Ai, Zhang, & Shi, 2013).

3. Discipline

In related research on social support in different disciplines, Ma and Lin (2006) find that there is no significant difference in the level of social support between different disciplines, which is consistent with the results of other researchers (Qiu & Dai, 2014; Sun & Lu, 2014). Huang and Li (2014) find that there are significant differences in the disciplineive support and objective support levels among different disciplines; and the literature and history students are significantly higher than the science and engineering students. An, Zhang and Shi (2013) find that there is no significant difference in disciplineive support and the utilization of support, but in objective support, students in arts are significantly higher than students in science. Shao and Hu (2018) find that students in science are higher than students in arts in the overall level of social support.

4. Student-Origin

Wu and Liang (2010), when selecting associate-degree students as research objects, find that there are no significant differences in overall social support, objective support and their utilizations; in terms of disciplineive support, the mean score of rural students is significantly higher than that of urban students. Wang, Su and Zhu (2008) find that urban college students score significantly higher on the objective support dimension than rural students. Huang and Li (2014) find that there are significant differences in the overall social support level and disciplineive support dimensions of college students from different origins; and the mean score of college students from rural areas is significantly higher than that from urban areas. Li (2010) finds that in the disciplineive support dimension, the mean score of rural college students is significantly higher than that of urban college students. However, Qiu and

Dai (2014) claim that there is no significant difference in social support between different student origins.

5. Single-child Or Not

Wu and Liang (2010), when selecting junior college students as research objects, find that there is no significant difference in the overall social support, objective support and their utilizations in single-child or not; but in disciplineive support, the students of non-single-child are significantly higher than single-child students. Wang, Su and Zhu (2008) find that in the utilization of social support, the mean score of non-single-child college students is significantly higher than that of single-child college students. Huang and Li (2014) find that there are significant differences in the overall social support, disciplineive support, and objective support dimensions between the single-child college students and the non-single-child college students, and that of the non-single-child college students is higher than that of the single-child college students. However, when the research objects are college students, Li (2010) finds that single-child college students have higher scores in overall social support or other dimensions than non-single-child students.

In summary, the differences in gender, grade, discipline, student-origin, and single-child or not in social support have not been consistently determined. Therefore, each background variable is included in this study for analysis.

2.5 Relevant Research on Learned Helplessness

Definition, related theories, measurement tools, and related demographic variables of learned helplessness are explored in this section.

2.5.1 Definition of Learned Helplessness

Learned Helplessness is a phenomenon first found in an animal experiment by American psychologist, Seligman (1967). Seligman used the dog as a test object and placed it in a closed cage. When the experiment bell rang, the researcher gave the dog an electric shock. In the previous experiments, the dog struggled after being shocked and tried to escape the cage, but the dog never escaped because the cage was locked. After many experiments, even if the researchers removed the lock before the electric shock, the dog without electric shock would not escape when hearing the bell but lay on the ground and made a hopeless embarrassment. Therefore, the researcher named learned helplessness a phenomenon of being unable to get rid of painful things and finally giving up. Subsequently, Seligman found the same outcome when he used people as research objects (Miller & Seligman, 1975). Chen (1990) defines learned helplessness from the individual's habituation that it is a negative attitude that the individual produces in facing challenges. Even if there is an opportunity for easy success, the individual lacks the courage to try, and this feeling is preceived in the long-term of failure and frustration; when facing conflicts and pressures, the individual will hold an evasive attitude, and finally forms a habit of escaping failure. Chen and Liu (2005) define learned helplessness from the psychological aspect of education that after experiencing some kind of learning, the individual shows a negative special psychological state in emotion, cognition and behavior. Wen (2014) believes that learned helplessness means that when the objects are repeatedly frustrated, it does not help no matter how hard they try, and thus creating a mentality of giving up or despair. Cai (2015) defines the learned helplessness from the human's mentality. As people or animals continue to suffer setbacks, they feel that they are

powerless to everything, and then lose confidence and fall into a state of helplessness.

Therefore, according to the interpretation of learned helplessness by Miller and Seligman (1975), this study defines learned helplessness as: in the process of learning, vocational college students suffer from setbacks and failures and can not resolve them in the tasks, and thus fall into a helpless state that eventually leads to a desperate negative attitude.

2.5.2 Related Theory of Learned Helplessness

The earliest learned helplessness theory is derived from Seligman and Campbell's (1965) experiments on dog's learning behavior. The researchers placed the dog in a closed cage and stimulated the dog with electric shock. At first the dog struggled after being shocked, yelling and trying to escape the cage. After several electric shocks, the researchers opened the cage door and continued to shock the dog. At this time, the dog was no longer struggling. When the dog found that it was going to be shocked, it cowered on the ground, gave a helpless mourning, and did not try to escape, which means that the dog in the experiment has learned to be helpless. Later, when Hiroto (1974) selected human beings as the objects, it was found that when human beings faced problems that they could not escape or solve, they also produced the behaviors like powerlessness and desperation, and believed that personal efforts were not related to the results, thus resulting in the formation of learned helplessness. Taking vocational college students as an example, most of the students have a poor foundation and have experienced the failure of the college entrance examination. These students may have good plans to study at the beginning of college life. However, due to their poor foundation, unsolid basic knowledge, and the poor learning ability, they can not catch up with class, finish homework, and achieve high

grades, feeling that their efforts are not proportional to the progress. The experience of academic failure constantly frustrates their self-confidence and forms the senses of "incapability, helplessness and indifference", which eventually lead to giving-up all the efforts. Finally, the learned helplessness is generated (Cui, 2013).

Seligman (1975) argues in his Learned Helplessness Theory that the controllability of failure largely affects the behavior. Abramson et al. (1978) proposed a revised learned helplessness theory based on Seligman and Campbell's (1975). He believes that attribution is the core of learned helplessness. Attribution refers to the way individuals interpret behavioral outcomes. Optimistic attribution can organize learned helplessness, while pessimistic attribution can produce learned helplessness. Therefore, the attribution way developed by individuals will affect the similar attribution in different failures, which means that the individual attribution will affect the subsequent motivation and behavior (Tominey, 1995). The theory holds that there are three factors that influence helplessness, which will be discussed as follows:

1. Internal Factors and External Factors

In terms of internal factors, individuals believe that the success or failure of an event lies in the individual himself, and the internal reasoning of the uncontrollable event leads to a sense of helplessness. In terms of external factors, the individual believes that the success or failure of the event lies in fate, and the interpretation of the external causes of an uncontrollable event leads to helplessness. Hiroro (1974) believes that there are two reasons for individuals to be helpless: one is the internal factor; the individual thinks that his ability is too poor, and he has no confidence in himself; the other is the external factor, the individual thinks that the event is very difficult, and it is difficult to solve such difficulties when everybody encounters them.

2. Stable Factors and Unstable Factors

Stable factors and unstable factors influence the persistence of helplessness. In other words, when an individual attributes failure to an unstable factor, the helplessness is temporary. Conversely, when an individual attributes failure or misfortune to stable factors, the individual's helplessness lasts longer.

3. General Factors and Specific Factors

General factors and specific factors affect the uncontrollable level of a certain event. When an individual makes a general attribution to an uncontrollable event, it will affect all the aspects of the individual's life. When an individual makes a specific attribution to an uncontrollable event, it only affects one aspect of his life.

In summary, according to the revised learned helplessness theory of Abramson et al. (1978), in the learning process, when individuals (vocational college students) encounter difficult events and are frustrated for many times, they show learning helplessness in internal and external control dimension, stability dimension, general dimension and finally in learning.

2.5.3 Measurement Tools for Learned Helplessness

Learned helplessness is getting more and more attention from the circles. Many researchers have developed different scales to measure individuals' learned helplessness, and several popular learned helplessness scales are discussed below:

1. Learned Helplessness Scale (LHS)

Learned Helplessness Scale (LHS) is developed by Quinless and Nelson (1988) for measuring students' helplessness in the learning process. It is mainly used to measure the degree of students' learned helplessness after facing learning difficulties and frustrations. The scale contains 20 items and four dimensions:

including cognitive helplessness, emotional helplessness, behavioral helplessness, and attributional helplessness. This scale uses Likert 5 points to score, 1 point means "stong non-conformity" and 5 points means "strong conformity". The lower score suggests lower learning helplessness in vocational college students. The Cronbach's α agreement coefficient for the total scale is 0.874 and the split-half reliability is 0.821 (Quinless & Nelson, 1988). So far, the scale is the most widely used learned helplessness scale, and many studies related to depression and stress have proved its effectiveness (Wu & Zeng, 2012; Bargai, Shakhar, & Shalev, 2007; Sullivan et al., 2012).

2. Attributional Style Questionnaire (ASQ)

Attributional Style Questionnaire (ASQ) is compiled by Peterson, Semmel, Von Baeyer, Abramson, Metalsky, and Seligman (1982) based on the Depression (Helplessness) Attribution Theory, which is used to measure the attributions generated in a certain event. The attributions include three dimensions: internal and external control dimension, stability dimension, and general dimension. The scale consists of 6 positive events and 6 negative events, 4 questions for each events, 48 questions in total. The scale adopts 7-point to score, and higher score suggests higher helplessness (degree of depression). The Cronbach's α on positive and negative events in this scale are 0.75 and 0.72, (Peterson et al., 1982). It is often used to measure the characteristics of depression or learned helplessness in individuals (Cheng, Sun, Yang, & Jia, 2018; Sun, Wu, Zhu, & Li, 2013, Elkadri, 2016).

3. Self-Rating Scale of Learned Helplessness

The Self-rating Scale of Learned Helplessnesss is developed by Wu, Zeng, Ma, Yan and Xu (2009), which is used to explore the individual's learned helplessness

and personality relationship. The scale contains a total of 18 items, including helplessness dimension (referring to the negative mentality of individual cognition, emotion and behavior) and desperation dimension (referring to the individual's negative psychological state of self-desperation, such as society, life, destiny, etc.). It adopts 5-point for scoring, 1 point means "strong unconformity" and 5 points means "strong conformity." Higher score suggests higher learned helplessness. The internal consistency of the general scale is 0.930, and the retest reliability is 0.898 (Wu, Zeng, Ma, Yan, & Xu, 2009). It is often used in the study of clinical symptoms such as individual mental disorders (Zhao, Zhong, Chen, & Chen, 2013).

In summary, by comparing the above three tools for measuring individual's learned helplessness, Quinless and Nelson's (1988) LHS has been widely used by many researchers to measure the learning of college students (Wu, & Zeng, 2012; Bargai, Shakhar, & Shalev, 2007; Sullivan et al., 2012). The research objects of this study are vocational college students, so the scale can be used to measure the learned helplessness of vocational college students.

2.5.4 Related Research on Learned Helplessness

Valås (2001) finds that the factors such as gender, grade, single-child or not have important influence on learned helplessness. Therefore, relevant research on the learned helplessness in gender, grade, student-origin, discipline, and single-child or not will be discussed in this study.

1. Gender

Researchers have different findings in the relevant studies of learned helplessness on gender. Valås (2001) finds that there is significant difference on the learned helplessness in gender, and that male students show higher learned

helplessness than female students. However, other researchers have different findings. Wang and Zhang (2013) find that there is no significant difference on the overall level of learned helplessness in gender, but the level of behavioral helplessness of female students is significantly higher than that of male students. Sorrenti, Filippello, Costa and Buzzai (2015) find that the level of learned helplessness of female students is significantly higher than that of male students when investigating the level of learned helplessness of Italian students. Jiang (2018) find that there is significant differences in the overall level of learned helplessness in class, cognitive helplessness, emotional helplessness, and behavioral helplessness in gender when investigating college students' learning habits. Further comparisons show that the mean score of male students is significantly higher than that of female students, no matter in terms of the overall level of learned helplessness or that of the three dimensions. However, it is also shown in some studies that gender has no significant difference in learned helplessness and its dimensions (Wu, et al., 2009; Dalla, Edgecomb, Whetstone, & Shors, 2008; Donald et al., 2012).

2. Grade

Researchers have different findings in the relevant studies of learned helplessness on grade. Wang and Zhang (2013) find that with the growth of grades, students show a higher level of learned helplessness, and the level of learned helplessness in senior grades is significantly higher than that of lower grades, which is coincident with other researchers (Peng, 2015; Wang, 2014). Jiang (2018) finds that students in different grades have significant differences in the level of emotional helplessness, and that the mean score of juniors is significantly higher than that of the other two grades. Wen (2014) finds that the secondary vocational students are found

to have significant differences in learned helplessness and attributional helplessness, cognitive helplessness, and emotional helplessness in different grades.

3. Discipline

In related research on learned helplessness, Jiang (2018) finds that students in different disciplines had significant differences in learned helplessness and its dimensions, and the mean score of students in arts is significantly higher than that of students in science. Wen (2014) finds that students in different disciplines have significant differences in the overall level of learned helplessness, and that students in science are higher than those in arts. However, Wu and Zeng (2012) find that there is no significant difference in the learned helplessness of students in arts.

4. Student-Origin

Researchers have different findings in the relevant studies of learned helplessness on student-origin. Wang (2014) finds that the learned helplessness of rural students is significantly higher than that of urban students when investigating the learned helplessness of English major students. Wen (2014) has similar findings when studying secondary vocational students; except for the significant difference between urban and rural areas in the attribution of learned helplessness, the mean scores of the overall learned helplessness level, behavioral helplessness, cognitive helplessness and emotional helplessness, rural students are significantly higher than that of urban students. Wu and Zeng (2012) also find that in addition to the cognitive helplessness, there are significant differences in the students' overall learned helplessness, emotional helplessness, attributional helplessness, cognitive helplessness. The mean score of rural students is higher than that of urban students. However, Li (2017) finds that college students from different origins have no significant differences in the

overall learned helplessness level and their dimensions when investigating the learned helplessness of nursing students.

5. Single-Child or Not

In the relevant study of learned helplessness in single-child or not, Li (2017) finds that there is no significant difference in the learned helplessness among college students who are single-child or not. Chen (2012), when selecting junior primary school students as research objects, finds that the level of learned helplessness of single-child students is significantly higher than that of non-single-child students.

In summary, there are differences in the research results of gender, grade, student-origin, and discipline on the learned helplessness, and few studies have explored the difference on whether college students are the single-child or not. However, it is found in many studies that whether college students are single-child or not has different influence on the mental health and academic mood (Zhan, Cheng, Li, & Xue, 2017; Zhang, Li, & Zhang, 2016). Therefore, this study will further analyze the vocational college students with different background variables (gender, grade, student origin, discipline, single-child or not), and observe whether there is a difference in their learned helplessness.

By the literature review, it is found that there is difference in each background variable (gender, grade, student-origin, discipline, single-child or not) among the four variables (acdemic self-efficacy, learning burnout, social support, and learned helplessness). Vocational college students of Henan Province are selected as the research objects in this study, and the hypothesis H1 is proposed: different background variables have significant differences in acdemic self-efficacy, learning burnout, social support, and learned helplessness.

2.6 Relationship Research of Acdemic Self-Efficacy, Learning Burnout, Social Support, Learned Helplessness

By reviewing the current research findings on acdemic self-efficacy, learning burnout, social support and learned helplessness, most of the previous studies only focus on the relationship between two factors, but in this section the relationship between each two of them or the relationship among the three of them will be explored.

2.6.1 Relationship between Acdemic Self-Efficacy and Learned Helplessness

According to Bandura's (1977) Self-Efficacy Theory, students' self-efficacy has a direct or indirect impact on the mentality of completing a learning task (Fan, 2012). According to Bandura (1986), students with low self-efficacy are often accompanied by negative psychological states such as depression and anxiety. Therefore, they also have a pessimistic view of their achievements. It is found in a number of studies that the cultivation of acdemic self-efficacy has a significant effect on eliminating or reducing negative learning mentality (Han, 2009; Tan & Zhu, 2010). Therefore, as the individual's self-efficacy is improved, the negative mentality of students with similar sense of helplessness will disappear during the learning process (Shang & Xu, 2008; Wu, 2013). Hmieleski and Baron (2008) find that individuals with high levels of self-efficacy have a higher optimism, while pessimistic and negative attitudes decrease. Du, Zhao, You and Zhang (2012) find that students with high self-efficacy have more confidence in learning behavior, can effectively manage learning, and always maintain a positive learning attitude and mentality. Ji, Liu and Li (2011) propose in the measures for college students' learned helplessness that

improving individual academic self-efficacy can reduce or avoid students' learned helplessness, which is consistent with other researchers' views (Dai, 2013). Putwain and Symes (2014) find that students with low levels of self-efficacy are more likely to have a learned helpless attitude or behavior. In other words, the higher the individual's level of acdemic self-efficacy, the lower the level of learned helplessness. Conversely, the lower level of individual's self-efficacy suggests the higher level of learned helplessness (Yang, 2016; Lindahl & Archer, 2013; Shaw et al., 1992). Thus, hypothesis H2 is deduced in this study: the acdemic self-efficacy of Chinese vocational college students has a significantly negative impact on learned helplessness.

2.6.2 Relationship between Acdemic Self-Efficacy and Learning Burnout

According to Bandura (1995), self-efficacy is the driving force of individual's behavior and the key component of initiative. It has been proved that individual's self-efficacy has a significant negative impact on burnout in various fields (Schaufeli & Buunk, 2003). In other words, for students, as a negative behavior in the learning process, learning burnout will be affected by the individual's self-efficacy (Yang & Lian, 2005). And it has been found in many studies that the level of self-efficacy directly affects the degree of individual's burnout, that is, the higher the individual's self-efficacy, the lower the degree of burnout. Conversely, the lower individual's self-efficacy suggests the higher burnout (Cherniss, 2017; Skaalvik & Skaalvik, 2007, 2010). For students, students' self-efficacy will have a direct impact on individual's learning behavior (Zhou & Guo, 2006). It is found in the study that the cultivation of self-efficacy can prevent and reduce the burnout behavior of individuals in the learning process (Tang & Fan, 2007; Wang & Miao, 2012). Zhou

and Jiang (2010) find that individuals with higher self-efficacy show lower learning burnout. Charkhabi, Abarghuei and Hayati (2013), when selecting Iranian college students as objects, find that learning burnout is less likely to occur in those with high level self-efficacy compared to students with low levels of self-efficacy. Jia et al., (2014) find the same in the study of vocational college students. The higher level of academic self-efficacy of vocational college students suggests the lower level of learning burnout. This result is consistent with the findings of Zhao (2016). In other words, the higher the individual's level of acdemic self-efficacy, the lower the level of learning burnout. Conversely, the lower the level of individual's self-efficacy, the higher the level of learning burnout (Shi, Gao, Wang, & Chen, 2012; Rahmati, 2015; Yu, Chae, & Chang, 2016). Thus, hypothesis H3 is proposed: acdemic self-efficacy of Chinese vocational college students has a significant negative impact on learning burnout.

2.6.3 Relationship between Learning Burnout and Learned Helplessness

Abramson et al. (1978) argue in the Theory of Learned Helplessness that when an individual experiences a series of learning failures, the individual will be attributed to the lack of confidence in his or her personal ability, and then become helpless to learning. According to the Theory of Learning Burnout, individuals have an impact on learning attitudes or mentality (learned helplessness) (Cushman & West, 2006; Murberg & Bru, 2004) in the process of learning burnout. Pompili et al., (2010) find that learning burnout is one of the important factors leading to learned helplessness. Kumcagiz et al., (2014) have shown that with the emergence of learning burnout, it is accompanied by a state of helplessness and hopelessness. Li (2008) shows that with the burnout of vocational college students in the learning process,

learned helplessness arises immediately. Xu, Zhang, Ning and Wu (2018) find that the learning burnout in the learning process is closely related to the learned helplessness. Pompili et al., (2010) find that individuals with higher levels of learning burnout show a higher degree of learned helplessness. Conversely, individuals with lower learning burnout show a lower degree of learned helplessness. It can be inferred that for college students, the higher the level of learning burnout, the higher the level of learned helplessness. Conversely, the lower the level of learning burnout, the lower the level of learned helplessness. Therefore, hypothesis H4 is proposed in this study: learning burnout of Chinese vocational college students has a significant positive impact on learned helplessness.

2.6.4 Relationship among Acdemic Self-Efficacy, Learning Burnout and Learned Helplessness

Reviewing the literature, it has been found in several studies that burnout can be used as a mediator (Li, Zhao, Xu, & Li, 2009). And in the study of reducing and preventing negative behaviors in learning (such as academic delays), learning burnout plays a mediating role (Ding & Zou, 2015). In the study of the relationship between self-efficacy and learning burnout, Boujut, Popa, Palomares, Dean and Cappe (2017) find that students with high acdemic self-efficacy are less prone to learning burnout. It has been found in a number of studies that individual's self-efficacy can significantly negatively affect learning burnout (Shi, 2012; Yu et al., 2016), while in the study of learning burnout generating learned helplessness, learning burnout will significantly affect the learned helplessness (Tang & Fan, 2007; Kumcagiz et al., 2014; Pompili et al., 2010). In the study of the learning status of Chinese vocational college students in the past ten years, all the researchers have

shown that the basic knowledge of vocational college students is not solid, the ability to analyze problems and solve problems is poor, and the ability to review after class and self-learning is not strong (self-efficacy) (Li, 2008; Jia, Wang, & Dai, 2014; Wang, 2019; Tan & Zhu, 2010; Xiao & Xu, 2011), and self-learning efficacy is easy to produce helplessness and burnout (learning burnout) (Rahmati, 2015), burnout emotions such as low sense of accomplishment, indifference to the surroundings, and finally falls into the learned helplessness (Chung, Choi, & Du, 2017; Diener & Dweck, 1980). In other words, the lower the level of self-efficacy of the individual's learning, the higher the level of learning burnout and the higher the level of learned helplessness. Conversely, the higher the individual's level of acdemic self-efficacy, the lower the level of learning burnout, and ultimately the lower the level of learned helplessness. Therefore, hypothesis H5 is proposed in this study: the learning burnout of Chinese vocational college students plays a mediating role in the influence of acdemic self-efficacy on learned helplessness.

2.6.5 Relationship among Acdemic Self-Efficacy, Social Support, Learned Helplessness

Bandura (1977, 1986) argues in his Social Cognitive Theory that the factors influencing learning are quite complex, not entirely personal factors, nor are completely contextual factors, but the interaction of individual and contextual factors (Bandura, 1977, 1986). As an external factor, social support often interacts with cognitive factors and regulates the physical and mental health of individuals (Li, Gao, Yang, & Liu, 2017; Quan & Wang, 2008; Russell et al., 2016). Previous studies have found that social support has a buffering and deconstructive effect on stress and negative emotions (such as helplessness). When both stressors and social support

come from the same environment, social support will be an important resource for easing the negative emotions brought about by personal stress. It can be seen that the negative emotions generated by vocational college students in facing learning difficulties or stress can be alleviated by social support (Haines, Hurlbert, & Zimmer, 1991; Thomas & Ganster, 1995). It is found in the study that social support has a regulatory effect on the relationship between self-efficacy and depression (Yang & Wang, 2017), self-efficacy and self-harmony (Li & Nie, 2013); depression and learned helplessness belong to the individual's negative psychological performance. Self-harmony and learned helplessness belong to the opposite aspect of psychological emotional performance (Fan, 2002). Academic self-efficacy is influenced by prior experience and social support in terms of acdemic self-efficacy (Schunk, 1995). Anke and Martin (2018) find that teachers' support can enhance students' belief in learning and ultimately alleviate the helplessness. Gu (2014) finds from two cases that family's care for students and the support in learning also played a role in easing the learned helplessness. Pi and Yan (2010) also find that when teachers have higher learning expectations (support) for students, the individual's learned helplessness will be lower. Li and Li (2014) also find that the social support perceived by individuals has a significant negative impact on learned helplessness. Based on this, it can be speculated that social support may regulate the relationship between social support and learned helplessness. Based on this, hypothesis H6 is proposed: the social support of Chinese vocational college students plays a regulatory role in the influence of acdemic self-efficacy on learned helplessness.

In summary, by reviewing the literature (Pintrich & Schunk, 2002; Schaufeli et al., 2002; Thoit, 1986; Miller & Seligman, 1975), the study disciplines'

(vocational college students) acdemic self-efficacy, learning burnout, social support, learned helplessness are defined, and the research tools for measuring the four variables are identified. The hypotheses H1-H6 in this study are derived by integrating the research literature on the relationship between variables.

CHAPTER 3

RESEARCH METHODS

With the aforementioned research purpose, research motivation, literature review, and the research results of other researchers as the basis of the design and structure of this study, cross-sectional survey method and questionnaires are adopted to collect data and understand the current situation and their relationships of academic self-efficacy, learning burnout, social support, and learned helplessness in vocational college students in Henan Province, China. This section is divided into seven subsections. The first section is the research structure, which clarifies the relationship between variables and the dimension of each variable; the second section is the research hypothesis; the third section is the detailed information of the research objects; the fourth section is research tools, respectively describing the four research tools and connotations; the fifth section is the test procedure of pretest questionnaire and the test of reliability and validity; the sixth section is the statistical analysis method; and the seventh section is the research procedure.

3.1 Research Structure

According to Bandura's (1977, 1986) Reciprocal Determinism in Social Cognitive Theory, and combined with the related literature review of the relationship among individual's academic self-efficacy, learning burnout, social support, and learned helplessness (Chen, 2012; Ding & Zou, 2015; Wang & Miao, 2012; Yang, 2016; Shi et al., 2012; Charkhabi, Abarghuei, & Hayati, 2013; Lindahl & Archer,

2013; Rahmati, 2015; Russell et al., 2016; Yu, Chae, & Chang, 2016), the structure diagram of the study is presented as Figure 3.1:

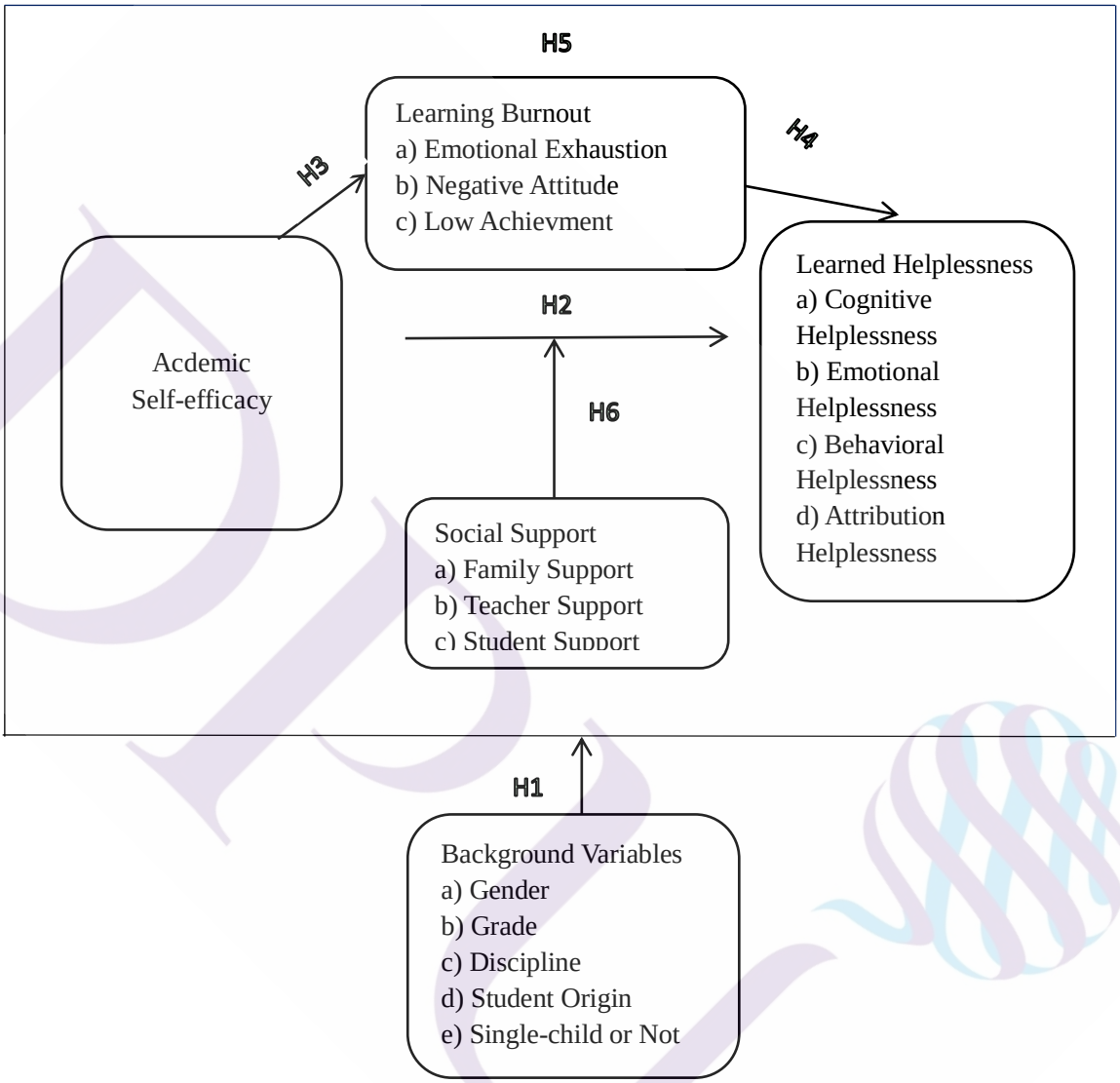

Figure 3.1 Structure Diagram of This Study

Source: Chen Yingmin, 2012; Ding Xiangmei, Zou Weixing, 2015; Hong, Huang, Qiu, 2014; Jiang, 2018; Wang, Miao, 2012; Yang Yan, 2016; Shi Leishan et al., 2012; Bandura, 1977 , 1986; Charkhabi, Abarghuei, & Hayati, 2013; Henry et al., 2019; Lindahl & Archer, 2013; Rahmati, 2015; Russell et al., 2016; Yu, Chae, & Chang, 2016.

1. Background Variables

Background variables include gender, grade, student-origin, discipline, and

single-child or not, which are used to analyze whether there is difference between academic self-efficacy, learning burnout, social support, and learning helplessness in Chinese vocational college students (Hong, Huang, & Qiu, 2014; Jiang, 2018; Liu & Wang, 2018; Xiong & Fang, 2017; Wu et al., 2009; Dalla, Edgecomb, Whetstone, & Shors, 2008; Donald et al., 2012; Ersanli, 2015; Henry, et.al., 2019; Shkullaku, 2013).

2. Acdemic Acdemic Self-Efficacy

Single Dimension (Schwarzer, Mueller, & Greenglass, 1999)

3. Learning Burnout

It includes emotional exhaustion, negative attitude and low achievement (Schaufeli, Martinez, Pinto, Salanova, & Bakker, 2002).

4. Social Support

It includes family support, teacher support and student support (Zimet, Dahlem, & Farley, 1988).

5. Learned Helplessness

It includes four dimensions of cognitive helplessness, emotional helplessness, behavioral helplessness and attribution helplessness (Quinless & Nelson, 1988).

3.2 Research Hypothesises

Reviewing and summarizing the relevant theories in the literature review and related empirical research in the past, combined with the research purpose, research questions and research structure, the hypothesises of this study are as follows:

H1: Different background variables have significant differences in acdemic self-efficacy, learning burnout, social support, and learned helplessness in Chinese

vocational college students (Hong, Huang, & Qiu, 2014; Jiang, 2018; Liu & Wang, 2018; Xiong & Fang, 2017; Wu, et al., 2009; Dalla, Edgecomb, Whetstone, & Shors, 2008; Donald et al., 2012; Ersanli, 2015; Henry, et al., 2019; Shkullaku, 2013);

H2: The acdemic self-efficacy of Chinese vocational college students has a significant negative impact on learned helplessness (Shang & Xu, 2008; Wu, 2013; Yang, 2016; Hmieleski & Baron, 2008; Lindahl & Archer, 2013; Shaw et al., 1992);

H3: Learning self-efficacy of Chinese vocational college students has a significant negative impact on learning burnout (Shi, Gao, Wang, & Chen, 2012; Rahmati, 2015; Yu, Chae, & Chang, 2016; Cherniss, 2017; Skaalvik & Skaalvik, 2007, 2010);

H4: Learning burnout of Chinese vocational college students has a significant positive impact on learned helplessness (Li, 2008; Xu, Zhang, Ning, & Wu, 2018; Pompili et al., 2010; Kumcagiz et al., 2014);

H5: Learning burnout of Chinese vocational college students plays a mediating role in the impact of acdemic self-efficacy on learned helplessness (Li, 2008; Shi, 2012; Tang & Fan, 2007; Pompili et al., 2010; Kumcagiz et al., 2014; Rahmati, 2015; Yu et al., 2016);

H6: The social support of Chinese vocational college students plays a regulatory role in the influence of acdemic self-efficacy on learned helplessness (Li, Gao, Yang, & Liu, 2017; Li & Nie, 2013; Quan & Wang, 2008; Yang & Wang, 2017; Russell et al., 2016).

3.3 Research Objects

Henan Province is actively promoting the Central Plains Economic Zone

and the Zhengzhou, Kaifeng, Luoyang National Independent Innovation Demonstration Zones (Yang, 2019). The construction of strategic vocational college education is most closely related to social and economic development; actively exploring the integration of production and education and developing vocational college education has become a realistic need to promote the coordinated development of regional economy (Wang, 2019). Higher vocational education is an important part of higher education in Henan Province. It is not only a new growth point of higher education in Henan Province, but also a new driving force for social and economic development. With the rapid development of Henan higher vocational education, its scale has expanded rapidly, and the quality of personnel training has been highly valued by the society (Su, Zhang, & Cai, 2019). Therefore, vocational college students in Henan Province are selected as the research objects in this study.

According to the statistical bulletin on the development of education in Henan Province in 2018, there are 83 higher (specialty) vocational colleges and universities in China by 2018. The number of registered students is 750,600, while the average number of higher (specialist) college students is 9,043 (Henan Provincial Department of Education, 2019). Due to the large number of parent groups, it is technically difficult for researchers to conduct random sampling, so purposive sampling and non-random sampling should be considered (Sun & Luo, 2002). Convenient sampling is a non-random sampling method based on the actual situation of the researchers for facilitating the research. The required information can be obtained in time (Lin, 2002). A convenient sampling method is used in this study to sample the students of the five higher vocational colleges (A, B, C, D, and E) in Henan Province. Among them, the A college is an excellent institution for the

evaluation of the talent training level of colleges and universities in Henan Province, also the key institution for the cultivation of higher vocational talents in Henan Province; B college is a higher vocational college of traditional technology, also an excellent institution for the cultivation of higher vocational talents in Henan Province; C college is a comprehensive higher vocational and technical college, also the national advanced unit of higher vocational education; D institute is a national vocational education model college, which has won many "Top Ten Vocational Colleges in Henan Province" and is a civilized unit in Henan Province. The E college has been awarded the Henan Provincial Vocational Education Brand Model College for many times, which has provided a number of excellent high-quality skilled personnel for society and intellectual support for the construction of the Central Plains Economic Zones; it has been a national wide influential college in Henan Province for the 40th anniversary of reform and opening up. Therefore, the five higher vocational colleges are qualified for the sample selection in this study. The samples are collected from the five higher vocational colleges in a convenient manner during two separate periods. The valid samples are divided into two batches according to the sampling time. The first batch is conducted for pre-test questionnaire (June 2019), and the second batch is conducted for formal questionnaire (July 2019); the two batches of samples were distributed to the selected freshmen, sophomores, and third-year juniors through WeChat and QQ with the help of counselors. The first batch are pre-test (N=293) samples for project analysis, exploratory factor analysis and reliability analysis of the scales in this study; the second batch are formal samples (N=1067) for verifiable factor analysis and hypothesis verification of all scales in this study.

3.3.1 Pre-test Samples

According to exploratory factor analysis, the ratio of the number of questions to the number of samples is preferably above 1:5 (Chen, Cheng, Chen, & Liu, 2009). The total number of questions in the four scales of this study is 57, and the pre-test requires at least 285 people. Therefore, 300 students from the three grades of the five higher vocational colleges (A, B, C, D, and E) must be selected as the targets for scheduled questionnaire. After the questionnaire is completed, 7 invalid questionnaires are eliminated, and 293 valid questionnaires are recovered. The recovery rate is 97%. Therefore, the number of valid pre-test samples in this study is 293.

3.3.2 Formal Samples

In the process of conducting formal questionnaire, according to the researcher (Wu, 2010), the average sample size of regional research samples is about 1,000. Therefore, when the formal questionnaires are distributed, the students that participated in the pre-test questionnaires are excluded, and a total of 1,075 students from the three grades of A, B, C, D, and E colleges are colleted for questionnaire. After the questionnaires are completed, the invalid questionnaires are excluded. 8 invalid samples are excluded and 1,067 valid questionnaires are collected, with the recovery rate of 99%. Therefore, the number of the number of valid formal samples in this study is 1,067.

3.4 Research Tools

The questionnaire method is adopted in this study, based on the above literature review and related theories and research purposes, the measurement tools

suitable for the research are selected for testing, after confirming the research structure and objects. The questionnaire measurement tools include the Acdemic Self-Efficacy Scale, Social Support Scale, Learning Burnout Scale, and Learned Helplessness Scale. The following four scales will be explained separately.

3.4.1 Acdemic Self-Efficacy Scale

The adopted scale in this study is the General Self-Efficacy Scale (GSES) compiled by Schwarzer, Mueller and Greenglass (1999). Because the research objects are vocational college students, the researcher made minor changes to the scale based on the students' actual learning status to perform the self-assessment of vocational college students in completing learning tasks. The scale belongs to single dimension scales, containing 10 items; the original scale uses 4 points to score, but in this study the improved scale adopts Likert 5 points to score, considering the uniformity of the general scale; 1 point means strong conformity, 5 points means strong unconformity, and higher scores suggest higher self-efficacy. The Cronbach's α coefficient of this scale is 0.86 and the split-half reliability is 0.85 (Schwarzer, Mueller, & Greenglass, 1999), indicating that the scale has reliability in measuring efficacy. Currently, the scale has been translated into at least 25 languages for worldwide use (Zhou, Zhao, Zhang, & Xiong, 2012; Scholz, Doña, Sud, & Schwarzer, 2002). The dimensions of compiled self-efficacy questionnaire and the items of each dimension are shown in Table 3.1:

Table 3.1 The Dimensions of the Acdemic Self-Efficacy Questionnaire and the Items in Each Dismension

Dimension	Item Number	Item Content
	AE1	1. In learning, if I try my best, I can always solve the problem.

Table 3.1 (Continued)

Dimensi	Item	Item Content
Acdemic Self-Efficacy	AE2	2. In learning, even if others disagree with my point of view, I still have a way
	AE3	3. For me, sticking to ideals and achieving learning goals is very easy.
	AE4	4. I am confident that I can effectively cope with any learning difficulties I have never seen before.
	AE5	5. With my talent, I will be able to cope with unexpected learning problems.
	AE6	6. If I make efforts, I will be able to solve most of the learning problems.
	AE7	7. I can calmly face learning difficulties because I believe I have abilities to
	AE8	8. When faced with a learning problem, I usually find several solutions.
	AE9	9. In learning, when there is trouble, I usually think of some ways to deal with
	AE10	10. In learning, no matter what problems I have encountered, I believe that I can find a solution.

Source: Schwarzer, Mueller and Greenglass (1999).

Note: The dimensional literature of the scale can be found in 2.2.2 Relevant Theory of Acdemic Self-Efficacy.

3.4.2 Learning Burnout Scale

The Maslach Burnoout Inventory-Student Survey (MBI-SS) is compiled by Schaufeli et al. (2002) for college students, and the scale is slightly modified according to the actual situation of the research objects—vocational college students. The scale consists of 15 items and three dimensions: emotional exhaustion (referring to excessive consumption of emotional resources, fatigue, such as: I feel depressed because of learning), negative attitude (refers to the attitude to the school activities, like cold and alienated, For example: I doubt whether the knowledge I have learned is useful), low accomplishment (referring to the lack of competence and accomplishment, for example: I can hardly deal with the problems that arise in learning). The Cronbach's α coefficient for the three dimensions is respectively 0.838, 0.844, and 0.875. Taking into account the integrity of all the scales, the 7-point scoring system in the original scale is changed to 5-point scoring system in this study

(1 point means “Rarely” = “a few times a year or less”; 2-point means “Occasionally” = “almost once a month”; 3-point means “usually” = “several times a month”; 4-point means “frequently” = ”once a week”; 5-point means “very frequently” = “every lesson”; and higher score suggests more severe learning burnout. The scale has been widely used in academia and has been proven to have good reliability and validity (Luo, Zhao, & Wang, 2014; Yavuz & Dogan, 2014). The dimensions of the modified learning burnout questionnaire and the items included in each dimension are shown in Table 3.2:

Table 3.2 Dimensions of Learning Burnout Questionnaire and Items in Each Dimension

Dimension	Item Number	Item Content
Emotional Exhaustion	LB1_1	1. I feel depressed because of my studies.
	LB1_2	2. After studying all day, I feel exhausted.
	LB1_3	3. In the morning, I can’t afford to be mentally motivated to face a day of study.
	LB1_4	4. As long as I was in class, I felt pressure and I was not feeling well.
	LB1_5	5. I feel that learning exhausts my energy.
Negative Attitude	LB2_1	1. Since entering university, I have become less and less interested in learning.
	LB2_2	2. I feel that learning is very boring.
	LB2_3	3. I doubt whether the knowledge I have learned is useful.
	LB2_4	4. I doubt whether learning makes sense to me.
Low Achievement	LB3_1	1. It is difficult for me to effectively deal with any problems in studies.
	LB3_2	2. I doubt the effectiveness of my efforts in learning.
	LB3_3	3. I did not perform well in my studies.
	LB3_4	4. It is difficult for me to effectively achieve the established learning goals.
	LB3_5	5. I didn’t learn interesting knowledge in my course.
	LB3_6	6. In the classroom, it is difficult for me to complete each learning task efficiently.

Source: Schaufeli et al. (2002)

Note: The dimensional literature of the scale can be found in 2.3.2 Related Theory of Learning Burnout.

3.4.3 Social Support Scale

The Perceived Social Support Scale (PSSS) compiled by Zimet, Dahlem and Farley (1988) is adopted in this study and is slightly modified based on the actual status of the vocational college students. "Family, friends, other" are modified as "family, teacher, classmate". The scale has a total of 12 items, including family support, teacher support, and student number. In order to meet the integrity of the scale, the 7-point scoring system of the original scale is modified to Likert 5-point scoring system, 1 point means "strong disagreement", 2 means "disagreement", 3 means "unsure", 4 means "agreement", and 5 means "strong agreement"; higher score suggests more social support the individual perceives. The Cronbach's α coefficient of the original full scale is 0.88 (Zimet et al., 1988). The scale has been widely used by many researchers in papers published in many core journals (Hu, 2017; Denis, Callahan, & Bouvard, 2015), indicating that the scale not only has good reliability, but also has wide applicability. The dimensions of the modified social support questionnaire and the items of each dimension are shown in Table 3.3:

Table 3.3 Dimensions of Social Support Pre-Test Questionnaire and Items in Each Dimension

Dimension	Item Number	Item Content
Family Support	SS1_1	1. My family will help me wholeheartedly in my studies.
	SS1_2	2. When I encounter learning dilemma, my families will provide me spiritual encouragement.
	SS1_3	3. I will talk to my family about the things in studying or living.
	SS1_4	4. My family will provide advice when I need make a decision.

Table 3.3 (Continued)

Dimension	Item Number	Item Content
Teacher Support	SS2_1	1. My teacher can really help me in my studies.
	SS2_2	2. When I meet a learning dilemma, I can ask help from teachers.
	SS2_3	3. My teacher will share my happiness and sorrow.
	SS2_4	4. I can talk to my teachers about my study or life.
Student Number	SS3_1	1. My classmates can really help me in studies.
	SS3_2	2. When I have a learning dilemma, I can ask my classmates for help.
	SS3_3	3. My classmates will share my happiness and sorrow.
	SS3_4	4. I can talk to my classmates about my study or life.

Source: Zimet, Dahlem and Farley (1988).

Note: The dimensional literature of the scale can be found in 2.4.2. Relevant Theory of Social Support

3.4.4 Learned Helplessness Scale

The scale adopted in this study is the Learned Helplessness Scale (LHS) which is developed by Quinless and Nelson (1988). The scale contains 20 items, including four dimensions: cognitive helplessness, emotional helplessness, behavioral helplessness, attributional helplessness. This scale uses Likert 5 points to score, 1 point means “strong unconformity”, 5 points means “strong conformity”; lower score suggests lower learned helplessness in vocational college students. The Cronbach’s α agreement coefficient for the general scale is 0.874 and the split-half reliability is 0.821 (Quinless & Nelson, 1988). The scale is currently the most widely used learned helplessness scale, and many studies related to depression and stress have proved its effectiveness (Wu & Zeng, 2012; Bargai, Shakhar, & Shalev, 2007; Sullivan et al., 2012). The dimensions of the learned helplessness questionnaires and the items of each dimension are shown in Table 3.4:

Table 3. 4 Dimensions of Learned Helplessness Questionnaire and Items in Each Dimension

Dimension		Item Number	Item Content
Helplessness	Cognitive Helplessness	HS1_1	1. I feel that even if I work hard, I can't get high scores.
		HS1_2	2. I feel that class doesn't make any sense to me.
		HS1_3	3. As far as learning is concerned, I always feel that it is very difficult to succeed.
		HS1_4	4. I feel that it is impossible for me to improve my academic performance.
		HS1_5	5. I feel that the exam has no meaning to me.
	Emotional Helplessness	HS2_1	1. When I have difficulties in learning, I am afraid to ask teachers and classmates.
		HS2_2	2. I am afraid to answer questions and ask questions in any course.
		HS2_3	3. I always feel that every exam is very difficult.
		HS2_4	4. In learning, I have never experienced a sense of accomplishment.
		HS2_5	5. I feel very depressed when I go to class.
		HS2_6	6. My academic performance is too bad, so I feel very depressed.
		HS2_7	7. The homework is always difficult, so I can't cope.
	Behavioral Helplessness	HS3_1	1. I have carefully reviewed before the exam, but the results are still very poor.
		HS3_2	2. I learn hard just for entering a higher school.
		HS3_3	3. I often don't know what to do in my studies.
		HS3_4	4. I don't know how to learn the courses well.
		HS3_5	5. Learning is too boring, I can't put up my spirit.
	Attribution	HS4_1	1. My grades are poor because I am not very smart and my brain is slow.
		HS4_2	2. I often make low scores because of my poor learning ability.
		HS4_3	3. I don't want to learn because learning is too boring.

Source: Quinless and Nelson (1988)

Note: The literature on the dimensions of this scale can be found in 2.5.2 Related Theory of Learned

Helplessness.

3.5 Test Procedure of Pre-test Questionnaire and Test of Reliability and Validity

In the process of questionnaire test, the pre-test questionnaire is perfomed first, followed by the project analysis, and the check of discrimination degree; after the test of reliability and validity of the questionnaire are conducted, the formal questionnaire is applied.

3.5.1 Procedure of Pre-Test Questionnaire

On June 12, 2019, from 7:00 pm to 8:00 pm, group testing was conducted, taking class as the test unit. Two testers with professional training were selected from each class for the pre-test questionnaire, and the test was performed in the self-study at night. First, the counselor emphasized the discipline; second, with the help of the counselor, the researcher issued the online questionnaires to the selected students through WeChat, QQ, etc.; third, the main testers made brief description on the purpose and requirements of the test, read the instruction, introduced the requirements and precautions when filling questionnaire, and ensured that every student could understand the requirements; fourth, the main testers checked the testing conditions in case the misunderstanding occurred; at last, the main testers checked the completeness of the questionnaires so as to avoid missing, and then submited the questionnaires after confirmation. The entire test process took approximately 30 minutes.

During the implementation of the pre-test questionnaires, 300 students were selected from the five colleges as the targets. Seven invalid questionnaires were eliminated, and 293 valid questionnaires were collected, with a recovery rate of 97%.

In this study, after the pre-test questionnaire was retrieved, SPSS24 software was used for project analysis and reliability analysis. Exploratory factor analysis (EFA) was used to test the validity and reliability of the pre-test questionnaires, which provided help for the construction of the formal questionnaires in this study.

3.5.2 Analysis of Pre-Test Questionnaire Items and Reliability and Validity Test

1. Item Analysis

Item analysis is used to analyze the availability of the items in the pre-test questionnaires. Wu's (2008) item analysis criteria is adopted in this study, and three categories of item analysis (comparison method for extreme group, correlation analysis method and homogeneity test) and six judgment criteria are also brought in. In this study, if there are more than 2 (including 2) indicators that are not up to standard, the item will be deleted (Wu, 2008), which is used as the basis for the judgment of item deletion in item analysis.

As for the comparison method for extreme group, the total scores of all the items were calculated and divided into high score group and low score group, the samples of the two groups accounted for 27% of the total samples; the critical ratio (CR), also the *t* value, of each item was calculated, which is used as the discrimination index; the larger the *t* value is, the larger the difference between the high score and low score groups is, and the larger the discrimination is; the *t* value is greater than 3 and the difference is significant, indicating that the item can effectively identify the scores of the high score group and low score group, and that the items should be retained. The ones not reaching a significant level should be deleted.

The correlation test is used to detect the correlation between each item's

score and the total score, that is, the relationship between the score of each item and the total score. Wu (2008) believes that if the correlation coefficient between the score of each item and the total score of the scale is above 0.400 and reaches a statistically significant level, it shows that there is a correlation between the item score and the total score of the scale. If the correlation coefficient of a single item does not reach 0.400, then deletion should be considered; in addition, the correlation between the score of the corrected item and the total score is used to calculate the Pearson product moment (correlation coefficient) of single item score and the dimension score (excluding the score of the item). The criterion for the item selection in this study is that the correlation coefficient between the corrected project score and the total score of the scale must be above 0.400, and if it is less than 0.400, it should be deleted.

In the homogeneity test, the α value (Cronbach's α coefficient) after the item is deleted is used to verify the internal consistency of the scale items, evaluate the reliability and stability of the entire scale, and adjust the item with lower reliability. The Cronbach's α value after item deletion refers to the Cronbach's α coefficient of the overall scale after the item is deleted. Therefore, the high stability scale must be verified by the α value, that is, virification must be based on the standardized Cronbach's α value; second, commonality and factor load in homogeneity test: the purpose of homogeneity test using factor analysis is to extract the common basic factors from the item, and reduce the main factors of multiple variables according to the degree of correlation, so as to simplify the complexity between variables, and thus construct the maximum interpretation of the original item. Therefore, in the part of factor analysis, the items are deleted based on the commonality and factor load, so that the items with common factors have the greatest homogeneity. The principal

component analysis method is used to extract the largest component, and the questions whose commonality is less than 0.2 should be deleted. Item deletion is judged with the reference of factor load greater than 0.5 (Wu, 2008).

Item analysis will be conducted in the four scales of acdemic self-efficacy, learning burnout, social support and learned helplessness.

1. Item Analysis in Acdemic Self-Efficacy Scale

In the item analysis of the pre-test questionnaire for academic self-efficacy, according to Wu's (2008) item analysis criteria, the item analysis is divided into three categories (comparison method for extreme group, correlation analysis method and homogeneity test), and 6 judgment standards. In this study, the items with two or more (including two) factors under the standards will be deleted (Wu, 2008), which is used as the basis for the judgment of the item analysis. From Table 3.5 Item Analysis of Acdemic Self-Efficacy Pre-Test Questionnaire, it is found that, in the extreme group comparison-critical ratio comparison, the CR value of each item in acdemic self-efficacy scale is within 11.660-15.971, which is greater than the criterion of 3.00; the correlation between the items of the academic self-efficacy scale and the total score is within 0.711-0.801, and all the items are greater than the judgment standard of 0.400 and both reach a significant standard; the correlation between the corrected item and the total score is within 0.633-0.746, and that of all the items are greater than the judgment standard of 0.400; in terms of homogeneity test, the Cronbach's α value of each item after the deletion in the acdemic self-efficacy scale is within 0.901-0.908, and that of all the others is less than the judging criteria of 0.914; the commonality of each item is within 0.497-0.648, and that of all the items is greater than 0.2; the factor load of each item is within 0.705-0.805, and that of all the items is above the standard

of 0.5.

Therefore, all the data in the extreme group comparison-critical ratio comparison, correlation analysis and homogeneity test in the acdemic self-efficacy scale show that all the six indicators in the scale reached the standards, and all the items are retained, indicating that the scale has good discrimination, as is shown in Table 3.5:

Table 3.5 Item Analysis of Acdemic Self-Efficacy Pre-Test Questionnaire

Dimension	Item Number	Extreme Goup Comparison	Correlation Analysis		Homoneneity Test		Indacatoras not Reached	Notes
		CR Value	Correlation between Item and Total Score	Correlation of Total Score after Correction	α Value after Correction	Commonality	Factor Load	
Selection Criterion		≧3.0	≧.400	≧.400	<.914	≧.20	≧.50	
Acdemic Self-Efficacy	AE1	12.571***	.717***	.637	.908	.499	.707	0 Retained
	AE2	13.308***	.719***	.643	.907	.507	.712	0 Retained
	AE3	13.721***	.711***	.633	.908	.497	.705	0 Retained
	AE4	12.779***	.726***	.658	.906	.534	.731	0 Retained
	AE5	13.929***	.799***	.746	.901	.648	.805	0 Retained
	AE6	15.971***	.792***	.730	.902	.629	.793	0 Retained
	AE7	17.173***	.801***	.742	.901	.645	.803	0 Retained
	AE8	14.401***	.773***	.710	.903	.602	.776	0 Retained
	AE9	11.660***	.732***	.660	.906	.535	.732	0 Retained
	AE10	12.668***	.736***	.670	.906	.550	.741	0 Retained

Notes: *p<0.05 **p<0.01 ***p<0.001

2. Item Analysis of Learning Burnout Pre-Test Questionnaire

In the item analysis of the pre-test questionnaire for learning burnout, Wu's (2008) item analysis criteria are used to divide the item analysis into three categories

(comparison method for extreme group, correlation analysis method and homogeneity test), and 6 judgment standards. In this study, the items with two or more (including two) factors not meeting the standards are deleted (Wu, 2008). This is used as the basis for the judgment of the item analysis. From Table 3.6 Item Analysis of Learning Burnout Pre-test Questionnaire, it is found that, in the extreme group comparison-critical ratio comparison, the CR value of the items in all dimensions of learning burnout is within 9.621-17.649, which are greater than the criterion of 3.00 and both reach significant standards; in terms of correlation detection, the correlation between the items in the all dimensions of learning burnout and the total score is within 0.629-0.823, which are greater than the judgment standard of 0.400 and both reach significant standards; the correlation between corrected items and the total score is within 0.583-0.792, and all items are greater than the judgment standard of 0.400. In terms of homogeneity detection, all dimensions of learning burnout meet the standard except that the Cronbach's α is equal to the standard (0.950) after the deletion of item number LB1_2. The Cronbach's α of the other items after the deletion is within 0.946-0.949, meeting the standard (<0.950); the commonality of each item is within 0.562-0.747, and that of all the items are greater than the standard (0.2); the factor load of each item is within 0.625-0.824, and that of all the items are greater than 0.5.

Therefore, in the item analysis of the learning burnout questionnaire, all the data of the extreme group comparison-critical ratio comparison, correlation analysis and homogeneity test shows that the six indicators of all the items reach the standard except item number LB1_2 which is not up to the standard index; so, all items are reserved because they do not meet the deletion criteria in this study, as is shown in

Table 3.6:

Table 3.6 Item Analysis of Learning Burnout Pre-test Questionnaire

Dimension	Item Number	Extreme Goup Comparison	Correlation Analysis		Homogeneity Test			Indacatoras not Reached	Notes
		CR Value	Correlation between Item and Total Score	Correlation of Total Score after Correction	α Value after Deletion	Commonality	Factor Load		
Selection Criterion		≧3.0	≧.400	≧.400	<.950	≧.20	≧.50		
Emotional Exhaustion	LB1_1	9.814***	.673***	.622	.949	.562	.663	0	Retained
	LB1_2	9.621***	.639***	.583	.950	.747	.625	1	Retained
	LB1_3	12.436***	.736***	.694	.948	.678	.732	0	Retained
	LB1_4	15.452***	.806***	.769	.946	.702	.803	0	Retained
	LB1_5	13.404***	.758***	.718	.947	.629	.757	0	Retained
Negative Attitude	LB2_1	17.149***	.792***	.755	.946	.634	.794	0	Retained
	LB2_2	16.978***	.823***	.792	.946	.684	.825	0	Retained
	LB2_3	16.901***	.784***	.744	.947	.658	.784	0	Retained
	LB2_4	14.965***	.794***	.757	.946	.665	.796	0	Retained

Notes: $^{*}p<0.05$ $^{**}p<0.01$ $^{***}p<0.001$

3. Item Analysis of Social Support Pre-Test Questionnaire

In the item analysis of the social support pre-test questionnaire, Wu's (2008) item analysis criteria is used to divide the item analysis into three categories (comparison method for extreme group, correlation analysis method and homogeneity test), and 6 judgment standards. In this study, the items with two or more (including two) factors not meeting the standard are deleted (Wu, 2008). This is used as the basis for the judgment of the item analysis. From Table 3.7 Item Analysis of Social Support Pre-test Questionnaire, it is found that, in the extreme group comparison-critical ratio

comparison, the CR value of the items in all dimensions of learning burnout is within 12.552-18.321, which is greater than the criterion of 3.00 and both reach significant standards; in terms of correlation detection, the correlation between the items in the all dimensions of learning burnout and the total score is within 0.685-0.848, which is greater than the judgment standard (0.400) and both reach significant standards; the correlation between corrected items and the total score is within 0.620-0.814, and all items are greater than the judgment standard (0.400). In terms of homogeneity detection, the Cronbach's α of all the items in social support dimensions is within 0.934-0.941 after the deletion of invalid items, meeting the standard of 0.942. The commonality of each item is within 0.639-0.775, and that of all the items are greater than the standard of 0.2; the factor load of each item is within 0.667-0.854, and all that of the items is greater than 0.5.

Therefore, in the item analysis of the social support questionnaire, all the data of the extreme group comparison-critical ratio comparison, correlation analysis and homogeneity test shows that the six indicators of all the items reach the standard; so, all the items are reserved in the study, as is shown in Table 3.7:

Table 3.7 Item Analysis of Social Support Pre-test Questionnaire

Dimension	Item Number	Extreme Goup Comparison	Correlation Analysis		Homogeneity Test		Indacatoras not Reached	Notes
		CR Value	Correlation between Item and Total Score	Correlation of Total Score after Correction	α Value after Deletion	Commonality	Factor Load	
Selection Criterion		≧3.0	≧.400	≧.400	<.942	≧.20	≧.50		
Social Support Family	SS1_1	13.804***	.685***	.620	.941	.760	.667	0	Retained
	SS1_2	12.552***	.700***	.637	.940	.760	.683	0	Retained
	SS1_3	15.042***	.752***	.698	.938	.639	.744	0	Retained

Table 3.7 (Continued)

Dimension	Item Number	Extreme Goup Comparison	Correlation Analysis		Homogeneity Test		Indacatoras not Reached	Notes
		CR Value	Correlation between Item and Total Score	Correlation of Total Score after Correction	α Value after Deletion	Commonality	Factor Load	
Selection Criterion		≧3.0	≧.400	≧.400	<.942	≧.20	≧.50		
	SS1_4	13.848***	.748***	.698	.938	.700	.741	0	Retained
Teacher Support	SS2_1	16.875***	.798***	.755	.936	.652	.801	0	Retained
	SS2_2	18.321***	.848***	.814	.934	.750	.854	0	Retained
	SS2_3	16.619***	.773***	.718	.937	.720	.774	0	Retained
	SS2_4	16.799***	.829***	.789	.934	.775	.833	0	Retained
Student Support	SS3_1	14.744***	.834***	.799	.934	.773	.845	0	Retained
	SS3_2	16.202***	.837***	.802	.934	.751	.847	0	Retained

Notes: $^{*}p<0.05$ $^{**}p<0.01$ $^{***}p<0.001$

4. Item Analysis of Learned Helplessness Pre-test Questionnaire

In the item analysis of the learned helplessness pre-test questionnaire, Wu's (2008) item analysis criteria is used to divide the item analysis into three categories (comparison method for extreme group, correlation analysis method and homogeneity test), and 6 judgment standards. In this study, the items with two or more (including two) factors not meeting the standard are deleted (Wu, 2008), which is used as the basis for the judgment of the item analysis. From Table 3.8 Item Analysis of Learned Helplessness Pre-test Questionnaire, it is found that, in the extreme group comparison-critical ratio comparison, the CR value of the items in all dimensions of learned helplessness is within 11.281-22.496, which is greater than the criterion of 3.00 and both reach significant standards; in terms of correlation analysis, the correlation between the items in the all dimensions of learning burnout and the total score is within 0.615-0.853, which is greater than the judgment standard of 0.400 and

both reach significant standards; the correlation between corrected items and the total score is within 0.574-0.834, and all items are greater than the judgment standard of 0.400. In terms of homogeneity detection, in the items of all dimensions of learned helplessness, except the Cronbach's α is 0.968 after the deletion of item number LS1_1, the Cronbach's α of the other items after the deletion is within 0.965-0.967, meeting the standard (<0.968); the commonality of each item is within 0.528-0.808, and that of all the items is greater than the standard of 0.2; the factor load of each item is within 0.600-0.858, and that of all the items are greater than 0.5.

Therefore, all the data in the extreme group comparison-critical ratio comparison, correlation analysis and homogeneity test in the learned helplessness questionnaire show that all the six indicators in the scale reach the standards except item number HS1_1, which is not up to the standard index; so, all items are reserved because they do not meet the deletion criteria in the study, as is shown in Table 3.8:

Table 3.8 Item Analysis of Learned Helplessness Pre-test Questionnaire

Dimension	Item Number	Extreme Goup Comparison	Correlation Analysis		Homogeneity Test			Indacatoras not Reached	Notes
		CR Value	Correlation between Item and Total Score	Correlation of Total Score after Correction	α Value after Deletion	Commonality	Factor Load		
Selection Criterion		≧3.0	≧.400	≧.400	<.968	≧.20	≧.50		
Cognitive Helplessness	HS1_1	11.281***	.615***	.574	.968	.629	.600	1	Retained
	HS1_2	14.562***	.699***	.661	.967	.677	.686	0	Retained
	HS1_3	18.936***	.774***	.744	.966	.723	.765	0	Retained
	HS1_4	17.950***	.786***	.759	.966	.716	.779	0	Retained
	HS1_5	16.080***	.773***	.745	.966	.622	.771	0	Retained
Emotional Helplessness	HS2_1	16.959***	.776***	.749	.966	.645	.771	0	Retained
	HS2_2	16.196***	.744***	.710	.966	.548	.739	0	Retained
	HS2_3	19.093***	.822***	.800	.965	.682	.825	0	Retained
	HS2_4	18.490***	.819***	.796	.965	.678	.822	0	Retained

Table 3.8 (Continued)

Dimension	Item Number	Extreme Goup Comparison	Correlation Analysis		Homogeneity Test			Indacatoras not Reached	Notes
		CR Value	Correlation between Item and Total Score	Correlation of Total Score after Correction	α Value after Deletion	Commonality	Factor Load		
Selection Criterion		≧3.0	≧.400	≧.400	<.968	≧.20	≧.50		
Emotional Helplessness	HS2_5	22.496***	.844***	.824	.965	.780	.851	0	Retained
	HS2_6	21.706***	.853***	.834	.965	.755	.858	0	Retained
	HS2_7	18.118***	.836***	.816	.965	.808	.844	0	Retained
Behavioral Helplessness	HS3_1	17.905***	.801***	.778	.966	.656	.805	0	Retained
	HS3_2	14.109***	.726***	.695	.966	.528	.724	0	Retained
	HS3_3	16.265***	.772***	.745	.966	.613	.773	0	Retained
	HS3_4	18.838***	.812***	.789	.965	.665	.814	0	Retained
	HS3_5	18.413***	.799***	.776	.966	.647	.803	0	Retained
Attribution Helplessness	HS4_1	21.823***	.839***	.819	.965	.769	.846	0	Retained
	HS4_2	21.088***	.826***	.804	.965	.708	.831	0	Retained
	HS4_3	18.056***	.829***	.808	.965	.798	.836	0	Retained

Notes: $^{*}p<0.05$ $^{**}p<0.01$ $^{***}p<0.001$

In summary, after analyzing the four scales such as acdemic self-efficacy, learning burnout, social support and learned helplessness, it is found that all the items in the pre-test questionnaire reach the index, so there is no deletion item, and all the items in the project analysis are retained. The reliability and validity of the four scales will be tested in this study.

2. Reliability and Validity Test of Acdemic Self-Efficacy Pre-Test Questionnaire

1) Validity Test

SPSS24.0 software and exploratory factor analysis (EFA) are used to test the validity of this scale. The principal component analysis is selected for extraction, and the maximum variation method is used for the axis conversion. According to Table 3.9 Efficacy Factor Analysis and Reliability Analysis of Acdemic Self-Efficacy,

the KMO is 0.918, and the Bartlett spherical check chi-square is 1581.609 (*P*<.001), indicating that the scale is suitable for factor analysis (Kaiser, 1974). One factor is extracted, and the factor load of the items within the factor ranged from 0.705 to 0.805, both of which are greater than 0.5 (Fabrigar et al., 1999). The eigenvalue is 5.458, the explanatory variation is 54.580%, and the total explanatory variation is 54.580%. According to Tabachnick, Fidell and Ullman (2007), the cumulative total explanatory variation is more than 50%, indicating that the scale has good validity. Therefore, the above data indicates that the scale has good validity, as is shown in Table 3.9:

Table 3.9 Factor Analysis and Reliability Analysis of Acdemic Self-Efficacy

Dimension	Item Number	Facotr Load	Square Load after Axis Conversion		Cronbach's α
			Eigenvalue	Explanatory Variation %	
Acdemic Self-Efficacy	AE1	.707	5.648	56.480	.913
	AE2	.712			
	AE3	.705			
	AE4	.731			
	AE5	.805			
	AE6	.793			
	AE7	.803			
	AE8	.776			
	AE9	.732			
	AE10	.741			
Cumulative Total Explanatory Variation: 56.480%					
Overall Reliability of the Scale：0.913					

2) Reliability Test

The reliability of the scale is measured by Cronbach's α. The analysis show

that the Cronbach's α coefficient of the acdemic self-efficacy scale is 0.913. According to Nunnally's (1978) standard, when the coefficient of Cronbach's α is greater than 0.9, it indicates that the scale has good internal consistency, so the scale has excellent reliability, as is shown in Table 3.9.

3. Reliability and Validity Test of Learning Burnout Pre-test Questionnaire

1) Validity Test

SPSS24.0 software and exploratory factor analysis (EFA) are used to test the validity of this scale. The principal component analysis is selected for extraction, and the maximum variation method is used for axis conversion. According to Table 3.10 Dimension Factor Analysis and Reliability Analysis of Learning Burnout, the KMO is 0.945, and the Bartlett spherical check chi-square is 2867.582 (P<.001), indicating that the scale is suitable for factor analysis (Kaiser, 1974). Three factors are extracted, including emotional exhaustion, negative attitude and low achievement. It is found that the factor load of item LB3_2 is distributed in two dimensionss at the same time. According to the standard that the factor load of each item must fall into the expected dimension and each indicator must not cross other potential factors (Bollen, 1989), item LB3_2 is deleted and 14 items are remained. Factor analysis is re-performed after the deletion, and the factor loads of the items within the three factor are respectively within 0.521-0.861, 0.667-0.756, 0.628-0.795, all of which are greater than 0.5. The eigenvalues of the dimensions are respectively 2.755, 0.662, 3.570, the explanatory variations are respectively 19.676%, 26.155%, 25.498%, and the total explanatory variation is 71.330%. Therefore, the above data indicates that the scale has good validity (Tabachnick, Fidell, & Ullman, 2007), as is shown in Table 3.10:

Table 3.10 Dimension Factor Analysis and Reliability Analysis of Learning Burnout

Dimension	Item Number	Factor Load	Squre Load after Axis Convertion		Cronbach's α
			Eigenvalue	Explanatory Variation %	
Emotional Exhaustion	LB1_1	.642	2.755	19.676	.864
	LB1_2	.861			
	LB1_3	.683			
	LB1_4	.532			
	LB1_5	.512			
Negative Attitude	LB2_1	.756	3.662	26.155	.884
	LB2_2	.700			
	LB2_3	.684			
	LB2_4	.667			

Table 3.10 (Continued)

Dimension	Item Number	Factor Load	Squre Load after Axis Convertion	Dimension	Item Number
Low Achievement	LB3_1	.642	3.570	25.498	.899
	LB3_3	.771			
	LB3_4	.795			
	LB3_5	.628			
	LB3_6	.734			
Cumulative Total Explanatory Variation: 71.330%					
Overall Reliability of the Scale: 0.946					

2) Reliability Test

Cronbach's α is used to test the reliability of the scale. The results show that the Cronbach's α coefficients of emotional exhaustion, negative attitude, low achievement in the learning burnout scale are respectively 0.864, 0.884, 0.899, and the Cronbach's α of the total scale is 0.946, indicating that the scale has good internal consistency (Nunnally, 1978), as is shown in Table 3.10.

4. Reliability and Validity Test of Social Support Pre-test Questionnaire

1) Validity Test

SPSS24.0 software and exploratory factor analysis (EFA) are used to test the validity of this scale. The principal component analysis is selected for extraction, and the maximum variation method is used for the axis conversion. According to Table 3.11 Dimension Factor Analysis and Reliability Analysis of Acdemic Self-Efficacy, the KMO is 0.914, and the Bartlett spherical check chi-square is 2779.647 (*P*<.001), indicating that the scale is suitable for factor analysis (Kaiser, 1974). Three factors are extracted, including family support, teacher support and student support, and the factor loads of the items are respectively within 0.656-0.834, 0.712-0.826, 0.608-0.808, all of which are greater than 0.5. The eigenvalue is within 2.702-3.549, the explanatory variations of the dimensions are 24.938%, 29.573%, 22.514%, and the cumulative total explanatory variation is more than 77.025%, indicating that the scale has good validity, as is shown in Table 3.11:

Table 3.11 Dimension Factor Analysis and Reliability Analysis of Learning Burnout

Demension	Item Number	Factor Load	Squre Load after Axis Convertion		Cronbach's α
			Eigenvalue	Explanatory Variation %	
Family Support	SS1_1	.834	2.993	24.938	.862
	SS1_2	.831			
	SS1_3	.656			
	SS1_4	.714			
Teacher Support	SS2_1	.767	3.549	29.573	.907
	SS2_2	.712			
	SS2_3	.826			
	SS2_4	.793			
Student Support	SS3_1	.608	2.702	22.514	.907
	SS3_2	.615			
	SS3_3	.808			
	SS3_4	.788			
Cumulative Total Explanatory Variation: 77.025%					
Overall Reliability of the Scale: 0.942					

2) Reliability Test

Cronbach's α is used to test the reliability of the scale. The results show that the Cronbach's α coefficients of family support, teacher support, student support in the social support scale are respectively 0.862, 0.907, 0.907, and the Cronbach's α of the total scale is 0.942. According to the Nunnally (1978) standard, when the Cronbach's α coefficient is greater than 0.7, it indicates that the scale has good internal consistency, as is shown in Table 3.11.

5. Reliability and Validity Test of Learned Helplessness Pre-Test Questionnaire

1) Validity Test

SPSS24.0 software and exploratory factor analysis (EFA) are used to test the validity of this scale. The principal component analysis is selected for extraction, and the maximum variation method is used for the axis conversion. According to Table 3.12 Dimension Factor Analysis and Reliability Analysis of Learned Helplessness, the KMO is .947, and the Bartlett spherical check chi-square is 2691.989 (P<.001), indicating that the scale is suitable for factor analysis (Kaiser, 1974). Four factors are extracted, including cognitive helplessness, emotional helplessness, behavioral helplessness and attribution helplessness. It is found in factor analysis that the factor loads of item HS1_5, HS2_5, HS2_6, HS2_7, HS3_1, HS3_4, HS3_5 are distributed in two dimensionss at the same time. According to the standard that the factor load of each item must fall into the expected dimension (Tabachnick, Fidell, &Ullman 2007) and each indicator must not cross other potential factors (Bollen, 1989), item HS1_5, HS2_5, HS2_6, HS2_7, HS3_1, HS3_4, HS3_5 are deleted and 13 items are remained. Factor analysis is re-performed after the deletion,

and the factor loads of the items within the three factors are respectively within 0.637-0.797, 0.546-0.802, 0.704-0.802, 0.674-0.768. The eigenvalues of the dimensions are within 2.007-2.957, the explanatory variations are respectively 23.014%, 16.253%, 15.439%, 22.743%, and the total explanatory variation is 77.449%. Therefore, the above data indicates that the scale has good validity (Tabachnick, Fidell, & Ullman, 2007), as is shown in Table 3.12:

Table 3.12 Dimension Factor Analysis and Reliability Analysis of Learned Helplessness

Demension	Item Number	Factor Load	Squre Load after Axis Convertion		Cronbach's α
			Eigenvalue	Explanatory Variation %	
Cognitive Helplessness	HS1_1	.797	2.992	23.014	.864
	HS1_2	.785			
	HS1_3	.703			
	HS1_4	.637			
Emotional Helplessness	HS2_1	.546	2.113	16.253	.872
	HS2_2	.802			
	HS2_3	.577			
	HS2_4	.550			
Behavioral Helplessness	HS3_2	.802	2.007	15.439	.803
	HS3_3	.704			
Attribution Helplessness	HS4_1	.761	2.957	22.743	.877
	HS4_2	.674			
	HS4_3	.768			
Cumulative Total Explanatory Variation: 77.449%					
Overall Reliability of the Scale: 0.945					

2) Reliability Test

Cronbach's α is used to test the reliability of the scale. The results show that the Cronbach's α coefficients of Cognitive Helplessness, Emotional Helplessness, Behavioral Helplessness and Attribution Helplessnessin in the learned helplessness

scale are respectively 0.864, 0.872, 0.803, 0.877, and the Cronbach's α of the total scale is 0.945. According to the Nunnally (1978) standard, when the Cronbach's α coefficient is greater than 0.7, it indicates that the scale has good internal consistency. As shown in Table 3.12.

In summary, through the item analysis and reliability and validity test of the Acdemic Self-Efficacy Scale, the Social Support Scale, the Learning Burnout Scale, and the Learned Helplessness Scale, it is found that the LB3_2 item is deleted from the Learning Burnout Scale, and 14 items are retained. In the Learned Helplessness Scale, 7 items of HS1_5, HS2_5, HS2_6, HS2_7, HS3_1, HS3_4, and HS3_5 are deleted, with thirteen items retained, and all the items are retained in the other two scales. Then the formal questionnaire is compiled based on this.

3.6 Test Procedure and Reliability and Validity Test of Formal Questionnaire

Three weeks later after the completion and revision of the pre-test questionnaires, the formal questionnaires are distributed to the testers. In order to maintain the rigor of the study and ensure the consistency and reliability of the formal questionnaires, the recovered formal questionnaires are conducted for reliability and validity tests by SPSS 24 and AMOS 22.

3.6.1 Test Procedure of Formal Questionnaires

Three weeks later after the pre-test questionnaires, the formal questionnaires are conducted. Excluding the classes that have participated in the pre-test questionnaires, 1,075 students are selected from the same five vocational colleges as the targets of the formal questionnaire. The test procedure of the formal questionnaire is consistent with the pre-test questionnaires. The formal questionnaires

are distributed to 1,075 cases. After the completion of the questionnaire, 8 invalid questionnaires are excluded, and 1,067 valid questionnaires are withdrawn, with a recovery rate of 99%. A normality test is performed on all data to verify whether the samples are conformed to the normality distribution or not. The test results show that the absolute value of the skewness coefficient (Skew) is less than 3, the standard value (Kline, 1998); the absolute value of the Kurtosis coefficient (Kurtosis) is less than 10, the standard value (Huang, 2002), indicating that the sample data conforms to the normal distribution. In addition, the internal consensus analysis of the questionnaire is conducted by SPSS24 software to verify the consistency and reliability of the formal questionnaires; AMOS 22 software and confirmatory factor analysis (CFA) are conducted for validity test, so as to verify the reliability and validity of the formal questionnaires.

3.6.2 Reliability and Validity Tests of the Formal Questionnaires

1. Reliability and Validity Test of Acdemic Self-Efficacy Formal Questionnaires

1) Validity Test

In terms of the Acdemic Self-Efficacy Formal Questionnaires, AMOS 22 and maximum likelihood estimation are used to perform a confirmatory factor analysis (CFA) on the test model. After testing, the model fitness index of the Acdemic Self-Efficacy Scale is shown in Table 3.13: the absolute fitness test index, the incremental fitness test index, and the simplified fitness test index are respectively determined; according to Bagozzi and Yi (1988), smaller χ^2 suggests better result, and the chi-square test showes $p>.05$, indicating that the theoretical model is consistent with the sample model; but the sample scale is so large that significance is often easy

to reach, so other indicators should be considered to test the convergent validity. In terms of the various indicators of this study: χ^2/df is 13.922, which has bias compared with the standard value (5), so this indicator is not fit; RMR is 0.042, meeting the standard (<0.08); RMSEA is 0.1, equal to the standard (0.1), AGFI is 0.858, meeting the standard (>0.8); NFI is 0.918, TLI is 0.901, CFI is 0.923, IFI is 0.923, all meeting the good fitting criteria (>0.9); RFI is 0.894, close to the standard value (0.900); PNFI is 0.714, meeting the standard (>0.5), PCFI is 0.718, meeting the standard (>0.5). Therefore, except the high chi-square value due to the large scale of samples, most of the fitness indicators reach the standards (Bentler & Chou, 1987; Hair, Anderson, Tatham, & Black, 1998; Lomax & Schumacker, 2004). Therefore, the measurement model for acdemic self-efficacy in this study has reached the fitness criteria.

Table 3.13 Fitness Index Checklist of Acdemic Self-Efficacy Test Model

Test Target	Index	Criteria of Fitness Index	Data of Test Results	Model Fitness Judgment
Absolute Fitness Test Index	χ^2	The Smaller the Better	487.259	-
	χ^2/df	<5.000	13.922	Unfit
	RMR	≦.080	0.042	Fit
	AGFI	≧.800	.858	Fit
	RMSEA	≦.100	.100	Fit
Incremental Fitness Test Index	NFI	≧.900	. 918	Fit
	TLI	≧.900	. 901	Fit
	CFI	≧.900	. 923	Fit
	RFI	≧.900	. 894	Fit
	IFI	≧.900	. 923	Fit
Simplified Fitness Test Index	PNFI	≧.500	. 714	Fit
	PCFI	≧.500	. 718	Fit

Notes: *p<0.05; **p<0.01; ***p<0.001

In testing the convergent validity of the scale, Table 3.14 shows that the

standardized factor load of each item of Acdemic Self-Efficacy Scale is within 0.638-0.799, reaching the standard (>0.5) and significance (Hair et al., 1998); the construct reliability (CR) of Acdemic Self-Efficacy Scale is 0.918, and the average variance extracted (AVE) is 0.529, reaching the standards (CR>0.7, AVE>0.5), indicating that the scale has good convergent validity (Bagozzi & Yi, 1988).

Table 3. 14 Confirmatory Analysis and Reliability and Validity Analysis of Acdemic Self-Efficacy Test Model

Dimension	Item Number	Factor Load	t(C.R.)	CR	AVE	Cronbach's α
Acdemic Self-Efficacy	AE1	.638	21.716	0.918	0.529	0.917
	AE2	.667	21.486			
	AE3	.688	21.293			
	AE4	.729	20.817			
	AE5	.764	20.292			
	AE6	.751	20.500			
	AE7	.799	19.560			
	AE8	.758	20.382			
	AE9	.741	20.662			
	AE10	.721	20.923			

Note: 1. All the above factors are significant ***p<0.001.

Note: 2. Construct Reliability (CR); Average Variance Extracted (AVE)

2) Reliability Test

Cronbach's α is used to detect whether the reliability coefficient of the acdemic self-efficacy formal questionnaires has internal consistency, as shown in Table 3.14, the Cronbach's α coefficient of the acdemic self-efficacy scale is 0.917, and the results show that the scale has a good internal consistency (Nunnally, 1978).

2. Reliability and Validity Test of Learning Burnout Formal Questionnaire

1) Validity Test

In terms of the Learninng Burnout Formal Questionnaires, AMOS 22 and

maximum likelihood estimation are used to perform a confirmatory factor analysis (CFA) on the test model. After testing the model fitness index of the Learning Burnout Scale, the absolute fitness test index, the incremental fitness test index, and the simplified fitness test index are respectively determined; according to Bagozzi and Yi (1988), smaller χ^2 suggests better result, and the chi-square test showes p>.05, indicating that the theoretical model is consistent with the sample model; but the sample scale is so large that significance is often easy to reach, so other indicators should be considered to test the convergent validity. In terms of the various indicators of this study: χ^2/df is 7.663, which is close to the standard value (5); RMR is 0.030, meeting the standard (<0.08); RMSEA is 0.079, meeting the standard (<0.08), AGFI is 0.899, meeting the standard (>0.800); NFI is 0.946, TLI is 0.942, CFI is 0.953, RFI is 0.934, IFI is 0.923, all meeting the good fitting criteria (>0.9); PNFI is 0.770, meeting the standard (>0.5), PCFI is 0.775, meeting the standard (>0.5). Therefore, except the high chi-square value due to the large scale of samples, most of the fitness indicators reach the standards (Bentler & Chou, 1987; Hair, Anderson, Tatham, & Black, 1998; Lomax & Schumacker, 2004). Therefore, the measurement model for acdemic self-efficacy in this study has reached the fitness criteria. As shown in Table 3.15.

Table 3.15 Fitness Index Checklist of Learning Burnout Test Model

Test Target	Indext	Criteria of Fitness Index	Data of Test Results	Model Fitness Judgment
Absolute Fitness Test Index	χ^2	The Smaller the Better	567.092	-
	χ^2/df	<5.000	7.663	Approximate
	RMR	≦.080	.030	Fit
	AGFI	≧.800	. 899	Fit
	RMSEA	≦.100	.079	Fit

Table 3.15 (Continued)

Test Target	Indext	Criteria of Fitness Index	Data of Test Results	Model Fitness Judgment
Incremental Fitness Test Index	NFI	≧.900	. 946	Fit
	TLI	≧.900	. 942	Fit
	CFI	≧.900	. 953	Fit
Test Target	Indext	Criteria of Fitness Index	Data of Test Results	Model Fitness Judgment
Simplified Fitness Test Index	RFI	≧.900	. 934	Fit
	IFI	≧.900	. 953	Fit
	PNFI	≧.500	. 770	Fit
	PCFI	≧.500	. 775	Fit

Notes: *p<0.05; **p<0.01; ***p<0.001

In testing the convergent validity of the scale, Table 3.16 shows that the standardized factor loads of emotional exhaustion, negative attitude, and low achievement in Learning Burnout Scale are respectively within 0.671-0.843, 0.765-0.838, 0.788-0.827, reaching the standards (>0.5) and significance (Hair et al., 1998); the construct reliability (CR) of the first item in the dimensions is set as default and thus displays no value. The construct reliability (CR) of Learning Burnout Scale is within 0.873-0.905, and the average variance extracted (AVE) is within 0.580-0.655, reaching the standards (CR>0.7, AVE>0.5), indicating that the scale has good convergent validity (Bagozzi & Yi, 1988). As shown in 3.16.

Table 3.16 Confirmatory Analysis and Reliability and Validity Analysis of Learning Burnout Test Model

Dimension	Item Number	Factor Load	t(C.R.)	CR	AVE	Cronbach's α
Emotional Exhaustion	LB1_1	.682	-	0.873	0.580	0.874
	LB1_2	.671	20.057			
	LB1_3	.784	23.089			
	LB1_4	.843	24.556			
	LB1_5	.812	23.807			

Table 3.16 (Continued)

Dimension	Item Number	Factor Load	t(C.R.)	CR	AVE	Cronbach's α
Negative Attitude	LB2_1	.824	-	0.878	0.643	0.878
	LB2_2	.838	32.435			
	LB2_3	.765	28.453			
	LB2_4	.778	29.132			
Low Achievement	LB3_1	.788	-	0.905	0.655	0.904
	LB3_3	.816	29.381			
	LB3_4	.827	29.855			
	LB3_5	.822	29.633			
	LB3_6	.792	28.274			

Note: 1. All the above factors are significant ***p<0.001

Note: 2. Construct Reliability (CR); Average Variance Extracted (AVE)

2) Reliability Test

Cronbach's α is used to detect whether the reliability coefficient of the learning burnout formal questionnaires has internal consistency. As is shown in Table 3.16, the Cronbach's α coefficients of emotional exhaustion, negative attitude, and low achievement in learning burnout scale are 0.874, 0.878, 0.904. The Cronbach's α coefficient of the total scale is 0.947, and the results show that the scale has a good internal consistency (Nunnally, 1978).

3. Reliability and Validity Tests of Social Support Formal Questionnaires

1) Validity Test

In terms of the Social Support Formal Questionnaires, AMOS 22 and maximum likelihood estimation are used to perform a confirmatory factor analysis (CFA) on the test model. After testing, the model fitness index of the Social Support Scale is shown in Table 3.17: the absolute fitness test index, the incremental fitness test index, and the simplified fitness test index are respectively determined; according

to Bagozzi and Yi (1988), smaller χ^2 suggests better result, and the chi-square test showes p>.05, indicating that the theoretical model is consistent with the sample model; but the sample scale is so large that significance is often easy to reach, so other indicators should be considered to test the convergent validity. In terms of the various indicators of this study: χ^2/df is 13.495, which is unfit to the standard value; RMR is 0.030, meeting the standard (<0.08); RMSEA is .100, meeting the standard (0.100), AGFI is 0.899, meeting the standard (>0.800); NFI is 0.932, CFI is 0.953, RFI is 0.934, IFI is 0.923, all meeting the good fitting criteria (>0.9); PNFI is 0.720, meeting the standard (>0.5), PCFI is 0.724, meeting the standard (>0.5). Therefore, except the high chi-square value due to the large scale of samples, most of the fitness indicators reach the standards (Bentler & Chou, 1987; Hair, Anderson, Tatham, & Black, 1998; Lomax & Schumacker, 2004). Therefore, the test model for social support in this study has reached the fitness criteria. As shown in Table 3.17.

Table 3.17 Fitness Index Checklist of Social Support Test Model

Test Target	Indext	Criteria of Fitness Index	Data of Test Results	Model Fitness Judgment
Absolute Fitness Test Index	χ^2	The Smaller the Better	688.236	-
	χ^2/df	<5.000	13.495	Unfit
	RMR	≦.080	.045	Fit
	AGFI	≧.800	. 837	Fit
	RMSEA	≦.100	.100	Fit
Incremental Fitness Test Index	NFI	≧.900	. 932	Fit
	TLI	≧.900	. 918	Fit
	CFI	≧.900	.969	Fit
	RFI	≧.900	.912	Fit
	IFI	≧.900	.937	Fit
Simplified Fitness Test Index	PNFI	≧.500	.720	Fit
	PCFI	≧.500	.724	Fit

Notes: *p<0.05; **p<0.01; ***p<0.001

In testing the convergent validity of the scale, Table 3.18 shows that the standardized factor loads of family support, teacher support, and student support in Social Support Scale are respectively within 0.781-0.845, 0.780-0.857, 0.836-0.870, reaching the standard (>0.5) and significance (Hair et al., 1998); the construct reliability (CR) of the first item in the dimensions is set as default and thus displays no value. The construct reliability (CR) of Social Support Scale is within 0.889-0.911, and the average variance extracted (AVE) is within 0.667-0.720, reaching the standards (CR>0.7, AVE>0.5), indicating that the scale has good convergent validity (Bagozzi & Yi, 1988). As shown in 3.18.

Table 3.18 Confirmatory Analysis and Reliability and Validity Analysis of Social Support Test Model

Dimension	Item Number	Factor Load	t(C.R.)	CR	AVE	Cronbach's α
Social Support	SS1_1	.781	-	0.889	0.667	0.888
	SS1_2	.845	29.515			
	SS1_3	.819	28.426			
	SS1_4	.820	28.469			
Teacher Support	SS2_1	.818	-	0.893	0.676	0.892
	SS2_2	.857	32.945			
	SS2_3	.780	28.869			
	SS2_4	.833	31.636			
Student Support	SS3_1	.841	-	0.911	0.720	0.911
	SS3_2	.870	35.687			
	SS3_3	.836	33.517			
	SS3_4	.847	34.203			

Note: 1. All the above factors are significant ***p<0.001

Note: 2. Construct Reliability (CR); Average Variance Extracted (AVE)

2) Reliability Test

Cronbach's α is used to detect whether the reliability coefficient of the

social support formal questionnaires has internal consistency. As is shown in Table 3.18, the Cronbach's α coefficients of family support, teacher support, and student support in Social Support Scale are respectively 0.888, 0.892, 0.911. The Cronbach's α coefficient of the total scale is 0.943, and the results show that the scale has a good internal consistency (Nunnally, 1978).

4. Reliability and Validity Test of Learned Helplessness Formal Questionnaires

1) Validity Test

In terms of the learned helplessness formal questionnaires, AMOS 22 and maximum likelihood estimation are used to perform a confirmatory factor analysis (CFA) on the test model. After testing, the model fitness index of the Learned Helplessness Scale is shown in Table 3.19: the absolute fitness test index, the incremental fitness test index, and the simplified fitness test index are respectively determined. χ^2/df is 4.712, meeting the standard value (<5); RMR is 0.022, meeting the standard (<0.08); RMSEA is .059, meeting the standard (0.1), AGFI is 0.942, meeting the standard (>0.800); NFI is 0.974, CFI is 0.979, RFI is 0.965, IFI is 0.979, all meeting the good fitting criteria (>0.9); PNFI is 0.737, meeting the standard (>0.5), PCFI is 0.741, meeting the standard (>0.5). Therefore, all the fitness indicators reach the standards (Bentler & Chou, 1987; Hair, Anderson, Tatham, & Black, 1998; Lomax & Schumacker, 2004), and the test model for learned helplessness in this study has reached the fitness criteria. As shown in Table 3.19.

Table 3.19 Fitness Index Checklist of Learned Helplessness Test Model

Test Target	Indext	Criteria of Fitness Index	Data of Test Results	Model Fitness Judgment
Absolute Fitness Test Index	χ^2	The Smaller the Better	278.014	-
	χ^2/df	<5.000	4.712	Fit
	RMR	≦.080	.022	Fit
	AGFI	≧.800	.942	Fit
	RMSEA	≦.100	.059	Fit
Incremental Fitness Test Index	NFI	≧.800	.961	Fit
	TLI	≧.900	.972	Fit
	CFI	≧.900	.979	Fit
	RFI	≧.900	.965	Fit
	IFI	≧.900	.979	Fit
Test Target	Indext	Criteria of Fitness Index	Data of Test Results	Model Fitness Judgment
Simplified Fitness Test Index	PNFI	≧.500	.737	Fit
	PCFI	≧.500	.741	Fit

Notes: *p<0.05; **p<0.01; ***p<0.001

In testing the convergent validity of the scale, Table 3.20 shows that the standardized factor loads of cognitive helplessness, emotional helplessness, behavioral helplessness, and attribution helplessness in Learned Helplessness Scale are respectively within 0.648-0.859, 0.775-0.833, 0.811-0.862, 0.827-0.869, reaching the standards (>0.5) and significance (Hair et al., 1998); the construct reliability (CR) of the first item in the dimensions is set as default and thus displays no value. The construct reliability (CR) of Learned Helplessness Scale is within 0.824-0.873, and the average variance extracted (AVE) is within 0.657-0.725, reaching the standards (CR>0.7, AVE>0.5), indicating that the scale has good convergent validity (Bagozzi & Yi, 1988).

Table 3.20 Confirmatory Analysis and Reliability and Validity Analysis of Learned Helplessness Test Model

Dimension	Item Number	Factor Load	t(C.R.)	CR	AVE	Cronbach's α
Cognitive Helplessness	HS1_1	.648	-	0.873	0.635	0.872
	HS1_2	.809	22.330			
	HS1_3	.853	23.225			
	HS1_4	.859	23.355			
Emotional Helplessness	HS2_1	.818	-	0.884	0.657	0.884
	HS2_2	.775	28.865			
	HS2_3	.833	31.990			
	HS2_4	.814	30.906			
Behavioral Helplessness	HS3_2	.811	-	0.824	0.700	0.822
	HS3_3	.862	31.552			
Attribution Helplessness	HS4_1	.858	-	0.888	0.725	0.887
	HS4_2	.827	33.917			
	HS4_3	.869	36.810			

Note: 1. All the above factors are significant ***p<0.001.

Note: 2. Construct Reliability (CR); Average Variance Extracted (AVE)

2) Reliability Test

Cronbach's α is used to detect whether the reliability coefficient of the Learned Helplessness Formal Questionnaires has internal consistency, as is shown in Table 3.20, the Cronbach's α coefficients of cognitive helplessness, emotional helplessness, behavioral helplessness and attribution helplessness in Learned Helplessness Scale are respectively within 0.872, 0.884, 0.822, 0.887. The Cronbach's α coefficient of the total scale is 0.950, and the results show that the scale has a good internal consistency (Nunnally, 1978).

In summary, a confirmatory factor analysis is performed on 1,067 testers using Amos 22 and maximum likelihood estimation. The model fitness degree, convergent validity and reliability test are conducted on the formal questionnaires consisting of Acdemic Self-Efficacy Scale, Learning Burnout Scale, Social Support

Scale and Learned Helplessness Scale. After the test, the four scales have good reliability and validity.

3.7 Discriminant Validity Test

Discriminant validity refers to the low correlation between different dimensions. That is, if the average variability (AVE) of each dimension is greater than the square of the correlation coefficient between the dimension and other dimensions, then there is discriminant validity between the dimensions (Fornell & Larcker, 1981). As is shown in Table 3.21, the square of AVE is greater than the correlation coefficient between all the dimensions, indicating that the questionnaire has discriminant validity.

Table 3.21 Checklist of Discriminant Validity

	Dimension	Item Number	Correlation Coefficient										
			A	B	C	D	E	F	G	H	I	J	K
A.	Acdemic Self-Efficacy	10	0.727										
B.	Emotional Exhaustion	5	-.145***	0.762									
C.	Negative Attitude	4	-.195***	.759**	0.808								
D.	Low Achievement	5	-.222***	.727**	.806***	0.809							
E.	Social Support	4	.396***	-.215***	-.256**	-.247**	0.817						
F.	Teacher Support	4	.394***	-.196***	-.260**	-.267**	.679**	0.822					
G.	Student Support	4	.381***	-.252***	-.279**	-.282**	.669**	.784**	0.849				
H.	Cognitive Helplessness	4	-.132***	.421**	.451***	.459**	-.168***	-.137***	-.108**	0.797			
I.	Emotional Helplessness	4	-.149***	.451**	.479***	.514**	-.190***	-.158***	-.180**	.763**	0.811		
J.	Behavioral Helplessness	2	-.210***	.443**	.465***	.521**	-.235***	-.218***	-.198**	.687**	.755**	0.837	
K.	Attribution Helplessess	3	-.191***	.501**	.511***	.542**	-.240***	-.213***	-.242**	.713**	.803**	.782**	0.849

Note 1: The average of the variables is the total average of all the items in the dimensions in this scale.

Note 2: The value of the diagonal is the square of the AVE of a latent variable, which should be greater than the value of the non-diagonal.

Note 3: *p<0.05; **p<0.01; ***p<

3.8 Statistical Analysis Methods of Data

The data of the questionnaires are processed and analyzed. After screening and determining the valid data, the data were processed and statistically analyzed using AMOS22.0 and SPSS24.0 software packages, which are described as follows:

1. Normality Test

In order to test whether the sample conforms to the normal distribution, a normality test is performed on all data in this study. The absolute value of the skewness coefficient (Skew) of all items in the formal questionnaire is less than the standard (3) (Kline, 1998); the absolute value of the Kurtosis coefficient (Kurtosis) is less than the standard (10) (Huang, 2002), indicating that the sample data conforms to the normal distribution.

2. Item Analysis

Item analysis is the most basic work in the development of scales. The main purpose of it is to make an adaptive assessment of the pre-test items (Qiu, 2000), which can also be used to test the reliability of individual items. According to the item analysis criteria Wu proposes (2008), item analysis is divided into three categories and six criteria. The item deletion criteria in this study are that more than 2 (including 2) indicators don't reach the standard (Wu, 2008).

First, the extreme group comparison-critical ratio value: according to the total score, all items are divided into high score group and low score group, and the

samples of each group accounted for 27% of the total samples; then the critical ratio value (CR value, that is, *t* value) of each item in the scales is obtained as an indicator for item discrimination; the larger the *t* value, the greater the difference between the high score group and the low score group, and the stronger the discriminating; the item with the *t* value greater than 3 and reaching significance can effectively identify the scores of the high score group and low score group, and then it should be retained; but the item with *t* value less than .05 and not up to the significance is recommended to be deleted.

Second, when calculating the correlation between the score of each item and the total score of the questionnaires, Wu (2008) believes that if the correlation coefficient between the score of each item and the total score of the scale is above 0.400 and reaches a statistically significant level, that is, there is a correlation between the score of each item and the total score of the scale, and the item should be retained; if the correlation coefficient of the single item is less than 0.400, then deletion can be considered; the score of corrected item is related to the total score: the correlation of the score of corrected item and total score requires the calculation of the Pearson correlation coefficient for each item and the total score of the sub-dimension (excluding the score of the item). In this study, the standard for item selection is the correlation coefficient of the score of corrected item and the total score of scale must be greater than 0.400; if the correlation coefficient is less than 0.400, then item deletion should be considered.

Besides, in the homogeneity test, the α value (Cronbach's α coefficient) after item deletion is used to verify the internal consistency of the scale items, evaluate the reliability and stability of the entire scale, and adjust the items with lower

reliability. The Cronbach's α value after item deletion refers to the Cronbach's α coefficient of the overall scale after the item is deleted. Therefore, the high stability scale must be verified by the α value, that is, virification must be based on the standardized Cronbach's α value; commonality and factor load in homogeneity test: the purpose of homogeneity test using factor analysis is to extract the common basic factors from the items, and reduce the main factors of multiple variables according to the correlation degree, so as to simplify the complexity between variables, and thus construct the maximum interpretation of the original items. Therefore, in the factor analysis part, the items are deleted based on the commonality and factor load, so that the items with common factors have the greatest homogeneity. The principal component analysis method is used to extract the largest component, and the test results of the items whose commonality is less than 0.2 are deleted. Item deletion is judged with the reference of factor load greater than 0.5 (Wu, 2008).

3. Factor Analysis

According to purposes, factor analysis is roughly divided into exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The purpose of exploratory factor analysis is to find common character from a set of disorganized variables, so as to establish new hypotheses or to develop new theoretical frameworks (Huang, 2000). Before exploratory factor analysis, KMO (Kaiser-Meyer-Olkin) test and Bartlett's ball test must be performed to determine whether the data is suitable for factor analysis. According to Kaiser (1974), if KMO>0.8 represents good conformity, the larger the KMO value, the more suitable the factor analysis. The *p*-value of Bartlett's ball type test must be less than 0.05, indicating that the sampling of the data is suitable for factor analysis (Chen, & Wang, 2010). In the pre-test questionnaire in

this study, EFA was used to test the validity of the research tool. The principal component analysis method is selected for extraction. The eigenvalue (Eigenvalue) of the factor must be greater than 1. After the maximum variability is conducted for axis conversion, the item with the absolute value of the factor load greater than 0.5 is retained (Tabachnick, Fidell, & Ullman, 2007). Each item's factor conformity must fall within the expected dimension, and each indicator must not cross other potential factors (Bollen, 1989).

After the formal questionnaire is administered, CFA is used to test the structural validity of the test questionnaires in the study. In examining the fitness index of each scale: According to Bagozzi & Yi (1988), smaller χ^2 is better, the chi-square test verifies $p>.05$, indicating that the theoretical model is fit to the sample model, but the sample scale is too large, and thus easy to reach significance, so other indicators should be considered to test convergence validity; χ^2/df is less than 3; GFI is greater than .8; NFI is greater than 0.8; RMR is less than 0.08; SRMR is less than 0.08; RMSEA is less than 0.08 are taken as acceptable standards (Ullman, 2001) . It is observed that the normalized factor load of each variable is greater than 0.5 (Hair et al., 1998), the average variance extracted (AVE) is greater than 0.5, and the composition reliability (CR) is greater than 0.7, indicating the scale has good convergence validity (Bagozzi & Yi, 1988). In addition, as described by Hair et al. (2006), the ideal value of AVE needs to be greater than 0.5. Therefore, the scale has good convergence validity.

4. Reliability Analysis

Reliability is used to assess the internal consistency of a total or subscale scales. Cronbach's α value is adopted to detect whether the acdemic self-efficacy

scale, learning burnout scale, social support scale, learned helplessness scale and the reliability coefficients of each subscale have internal consistency. The criterion are: Cronbach's α coefficient ≦0.30 is regarded as untrustworthy; 0.30≦Cronbach's α≦0.40 is barely credible; 0.40≦Cronbach's α≦0.50 is slightly credible; 0.50≦Cronbach's α≦0.70 is credible; 0.70≦Cronbach's α≦0.90 is very reliable; 0.90 ≦Cronbach's α is very reliable (Nunnally, 1978).

5. Post-hoc Test for Common Method Variance

In order to test the Common Method Variance (CMV), Harman single factor test is adopted in this study. The 57 items in the scale are conducted for factor analysis to test the number of factors without conversion and to test the cut-off value when the variation explained by the first factor with eigenvalues greater than 1 is below 40% (Podsakoff et al., 2003).

6. Descriptive Statistical Analysis

The answering results of background variables (gender, grade, etc.) and the other variables (acdemic self-efficacy, social support, learning burnout, learned helplessness) are collected, coded, and the missing values are detected and processed. Then, data on the distribution number, percentage statistics, mean, maximum and minimum of standard deviations are collected to understand the background of the vocational college students in Henan Province, China and the distribution of each dimension of the variables.

7. Variation Analysis

Independent sample *t* test and ANOVA square test are adopted to analyze whether the background variables (gender, grade, source, etc.) and the dimensions in acdemic self-efficacy, social support, learning burnout, and learned helplessness have

significant differences. When performing independent sample *t* test, different test methods will be chosen according to whether the variance is homogeneous. When detecting the difference, it is necessary to observe whether the maternal variation is equal before, and then determine the result of the independent sample *t* test; when *p* is less than 0.05, the mean should be compared; when there is significant difference in the ANOVA test, the homogenous Levene test of variation should be first conducted, and then different methods are chosen for Post-hoc test based on whether the maternal variation is homogeneous. The homology test of variation finds that the *p*-value significantly indicats that the variation of each sample is significantly different; and the variations are not of homology. Finally, Dunnett T3 method is selected for post-hoc comparison test. The homogeneity of the variation finds that the *p*-value doesn't not significantly indicate the variation of each sample. There is no significant difference in the number, and the variation is homogeneous. The Scheffe method or the Least Significant Difference (LSD) should be selected for post-hoc comparison test.

8. Correlation Analysis

Correlation analysis is to analyze the correlation degree between different variables. Pearson correlation coefficient is used in this study to analyze whether there is correlation and the correlation degree between the four variables. Qiu (2010) believes that the correlation coefficient (r) = 0 indicates no correlation between variables, the absolute value <0.1 indicates weak correlation, $0.1 \leqq r<0.4$ indicates low correlation, $0.4 \leqq r<0.7$ indicates moderate correlation, $0.7 \leqq r<1.0$ indicates a high correlation, and $r=1.0$ indicates a complete correlation.

9. Linear-regression Analysis

Regression analysis is to perform statistical regression steps between two variables to detect whether there is a significant prediction of its regression coefficients. In this study, linear regression analysis is used to predict the prediction of academic self-efficacy, social support, and learning burnout on the learned helplessness in the vocational college students of Henan Province, China, as well as the prediction of academic self-efficacy on the learned burnout (Fox, 1997). According to the regression model proposed by Baron and Kenny (1986), it is tested whether learning burnout plays a mediating role in the effect of acdemic self-efficacy on learned helplessness, and whether social support plays a mediating role in the effect of acdemic self-efficacy on the learned helplessness.

10. Sobel Mediating Effect Test

According to Sobel's (1982) test method, the non-standard regression coefficients and error values of independent variables on the moderator variables, as well as the non-standard regression coefficients and error values of the moderator variables on dependent variables are used to calculate the *Z* value of Sobel test; the absolute value>1.96 indicates that variables play a significant mediating role in the relationship between independent variables and dependent variables.

3.9 Research Procedure

Following the investigation procedure of the general research, this study is divided into the preparation phase, the development phase, the research phase and the completion phase from the determination of the research direction and the theme to the discussion on the recommendations and countermeasures:

The first phase (preparation phase): According to the current social background and the current situation of the vocational college students, the author of

this paper studied the relevant literature at home and abroad to determine the research direction and theme, collected literature related to learned helplessness in libraries and online databases, identified countermeasures and strategies for mitigating learned helplessness from external and intrinsic reasons that affect learned helplessness, and determined the three variables: academic self-efficacy, learning burnout, and social support.

The second phase (development phase): to find, record and classify related books and documents, and then recognize the concept, structure and relationship between the four variables, and form a preliminary draft of the literature review and determine the research structure.

The third phase (research phase): the questionnaires of four variables are collected, selected and determined, and the determined questionnaires are appropriately revised to form the questionnaires that are consistent with the research object. The pre-test questionnaires are conducted on the selected five vocational colleges in Henan Province. After that, the formal questionnaires are distributed and collected for the students who did not participate in the pre-tests in the five vocational colleges. SPSS 24.0 statistical software is used to analyze the data, to explore the differences, correlation, regression analysis and moderating effect of acdemic self-efficacy, learning burnout, social support, and learned helplessness in the vocational college students of Henan province.

The fourth phase (completion phase), also the phase of result discussion and suggestion: according to the results of statistical analysis, the results are analyzed and demonstrated, the theoretical and practical significance of the results in reality, and constructive opinions are proposed.

The main research process is shown in Figure 3.2:

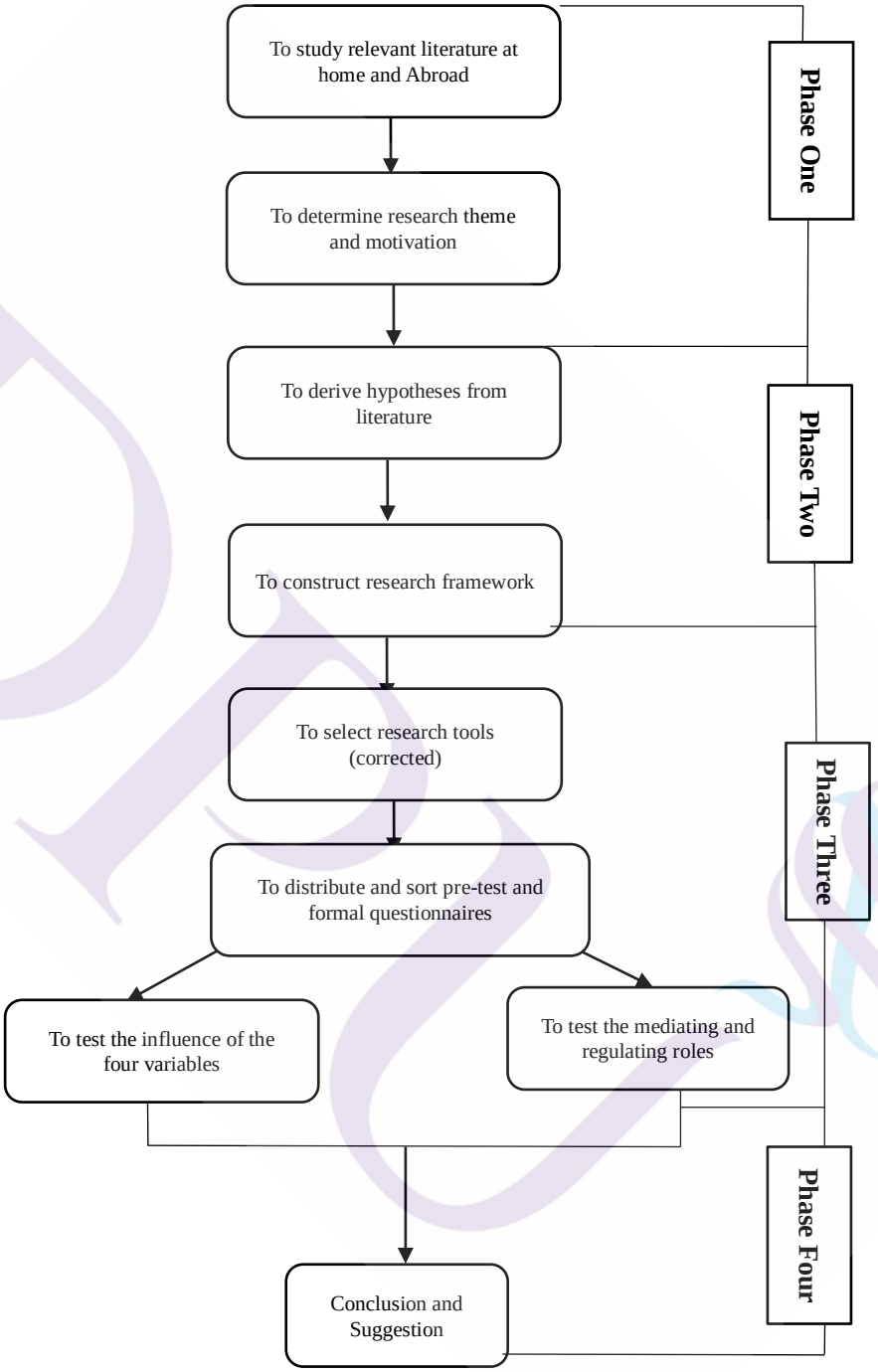

Figure 3.2 Research Flow Chart

In summary, the structure of the study is constructed based on the research objectives, research motivations and research questions in Chapter 1, and the related

literature and the relationships between acdemic self-efficacy, learning burnout, social support, and learned helplessness in the Chapter 2; Acdemic Self-Efficacy Scale, Social Support Scale, Learning Burnout Scale, and Learned Helplessness Scale are conducted for item analysis and reliability analysis with SPSS24 software. Exploratory factor analysis (EFA) is used to verify the validity and reliability of the questionnaire so as to construct a formal questionnaire for the study. It was found in the test that the LB3_2 item is deleted from the Learning Burnout Scale, and 14 items are retained. HS1_5, HS2_5, HS2_6, HS2_7, HS3_1, HS3_4, and HS3_5 are deleted from the Learned Helplessness Scale, and 13 items are retained, all the items of the other two scales are retained, and the pre-test questionnaires after the deletion all have good reliability and validity, and thus the formal questionnaires are formed. AMOS 22 software and confirmatory factor analysis (CFA) are used to test the validity of the formal questionnaires, and the discriminant validity test and Cronbach's α reliability test are performed with SPSS 24.0. The test shows that the formal questionnaires of this study have good reliability.

CHAPTER 4

RESEARCH FINDINGS

This chapter includes seven parts, which are deviation test of common methods, descriptive analysis, difference analysis, correlation analysis and regression analysis, answer statement of research questions and hypothesis verification results. In the descriptive analysis, frequency is mainly used to display the background variables of the population and the variables. Difference analysis is to test the difference of different background variables in acdemic self-efficacy, learning burnout, social support, and learned helplessness; the relevant analysis is to understand acdemic self-efficacy, learning burnout, social support, and learned helplessness; regression analysis is to understand the effects of acdemic self-efficacy, learning burnout, social support, and learned helplessness, test the mediating effect of learning burnout between acdemic self-efficacy and learned helplessness, and the effect of social support between acdemic self-efficacy and learned helplessness; finally the answers to the research questions are stated and the results of the research hypothesis are demonstrated as the below.

4.1 Deviation Test of Common Methods

Using self-reporting method to collect data may have a common method deviation. Therefore, based on the practices of previous scholars, the author of this study uses prior pre-programmed control and post-mortem statistical test to avoid the common method deviation. First of all, in the process of testing, strict procedural control is adopted, emphasizing that the results of this questionnaire are only used for

academic research, the information is absolutely confidential, and filled in anonymously; in the post-mortem statistical test, Harman's single factor test is used in the the process of data analysis. The items of all variables are put into a exploration item for analysis; after testing, 11 principal components are extracted before the axis convertion of the factors, and the interpretation variation of the first factor is 33.685%, which is less than 40% of the critical criterion (Podsakoff, MacKenzie, & Lee, 2003), so there is no serious common method deviation in this study.

4.2 Descriptive Analysis

In this study, the demographic variables of the disciplines are displayed in frequency and percentage. The mean and standard deviation are used to understand the overall status of acdemic self-efficacy, learning burnout, social support, and learned helplessness.

4.2.1 Descriptive Analysis of Background Variables in Vocational College Students

In 1,067 formal samples, five background variables including gender, grade, student-origin, discipline, and single-child or not are examined. The results show that in terms of gender, there are 521 male students, accounting for 48.8% of the samples, and 546 female students, accounting for 51.2%; in terms of grade, 293 cases are freshmen, accounting for 27.5%, 438 cases are sophomores, accounting for 41%, 336 cases are juniors, accounting for 31.5%; in terms of students, 876 cases come from rural areas, accounting for 82.1%, 191 cases come from urban areas, accounting for 17.9%; in terms of disciplines, 442 cases are in liberal arts, accounting for 41.4%, 625 cases are in science, accounting for 58.6%; 135 cases are single-child, accounting for

12.7%, and 932 cases are non-single-child, accounting for 87.3%. The above data shows that the ratio of male students to female students is equal in this sample. The number of students in sophomores is relatively high. The numbers of freshmen and juniors are relatively balanced. The students from rural areas take the majority of the cases. The number of students majored in science is larger than that majored in arts, and most of the students are non-single-child. As shown in Table 4.1:

Table 4.1 Demographic Variable Statistical Table of Formal Samples

Demographic Variable	Classification	Frequency	Percentage
Gender	Male	521	48.8%
	Female	546	51.2%
Grade	Freshmen	293	27.5%
	Sophomore	438	41.0%
	Junior	336	31.5%
Student-origin	Rural	876	82.1%
	Urban	191	17.9%
Discipline	Art	442	41.4%
	Science	625	58.6%
Single-child or not	Positive	135	12.7%
	Negative	932	87.3%

4.2.2 Descriptive Analysis of Acdemic Self-Efficacy

The analysis shows that acdemic self-efficacy is a single dimension including 10 items. The degree of the acdemic self-efficacy (M=3.293, SD=0.737) of the tested vocational college students is above the average. As shown in Table 4.2:

Table 4. 2 Descriptive Statistical Table of Acdemic Self-Efficacy (N=1,067)

Dimension & Entirety	Question Count	M	SD
Acdemic Self-Efficacy	10	3.293	.737

4.2.3 Descriptive Analysis of Learning Burnout

The analysis shows that learning burnout includes three dimensions, namely emotional exhaustion (5 questions), dissipative attitude (4 questions), and low achievement (5 questions) (M=1.986, SD=0.731). A degree of learning burnout exists in vocational college students, but at a lower-middle level. The dimensions are in the following order of low achievement (M=2.006, SD=0.801), emotional exhaustion (M=1.995, SD=0.755), and negative attitude (M=1.949, SD=0.840). It can be seen that the level of low achievement is higher than that of the other two dimensions. As shown in Table 4.3:

Table 4.3 Descriptive Statistical Table of Learning Burnout (N=1,067)

Dimension & Entirety	Question Count	M	SD
Emotional Exhaustion	5	1.995	.755
Negative Attitude	4	1.949	.840
Low Achievement	5	2.006	.801
Overall Acdemic Self-Efficacy	14	1.986	.731

4.2.4 Descriptive Analysis of Social Support

The analysis shows that social support includes three dimensions, namely family support (4 questions), teacher support (4 questions), and student support (4 questions) (M=3.6176, SD=0. 799). The social support perceived by the vocational college students is at the upper-middle level, and their dimensions are in the following order of family support (M=3.706, SD=0.904), student support (M=3.623, SD=0. 871), and teacher support (M=3.524, SD=0.892). It can be seen that the level of teacher support perceived by students is lower than that of the other two dimensions;

Zhang, Zhang, and Li (2015) have similar findings in college students; compared with other supports (including teacher support), vocational college students have higher awareness in student support and family support. As shown in Table 4.4:

Table 4.4 Descriptive Statistical Table of Social Support (N=1,067)

Dimension & Entirety	Question Count	M	SD
Family Support	4	3.706	.904
Teacher Support	4	3.524	.892
Student Support	4	3.623	.871
Overall Social Support	12	3.618	.799

4.2.5 Descriptive Analysis of Learned Helplessness

The analysis shows that the learned helplessness includes four dimensions: namely cognitive helplessness (4 questions), emotional helplessness (4 questions), behavioral helplessness (2 questions), and attribution helplessness (3 questions). The degree of learned helplessness of the tested vocational college students is at a medium level (M=2.484, SD=0. 815), and their dimensions are in the following order of cognitive helplessness (M=2.548, SD=0.903), behavioral helplessness (M=2.500, SD=0.931), emotional helplessness (M=2.447, SD=0.880), and attribution helplessness (M=2.436, SD=0.908). It can be seen that the level of cognitive helplessness is relatively higher than other dimensions. Jiang (2018) also finds that the cognitive helplessness of students is more than other dimensions (such as emotions, etc.) when studying the learning helplessness of college students. As shown in Table 4.5:

Table 4.5 Descriptive Statistical Table of Learned Helplessness (N=1,067)

Dimension & Entirety	Question Count	M	SD
Cognitive Helplessness	4	2.548	.903
Emotional Helplessness	4	2.447	.880
Behavioral Helplessness	2	2.500	.931
Attribution Helplessness	3	2.436	.908
Overall Learned Helplessness	13	2.484	.815

4.3 Difference Analysis

Difference analysis is to determine whether the factors can explain the changes in data with a hypothetical test. Independent sample *t* is used to test differences of acdemic self-efficacy, learning burnout, social support, and learned helplessness in different genders, disciplines, student-origin, and single-child or not. Size of Effect *d* value is used to represent the statistic of independent variables to dependent variables. According to Cohen (1988), $0.5>d\geqq0.2$ represents the low effect, $0.8>d\geqq0.5$ represents the medium effect, $d\geqq0.8$ represents high effect; single factor ANOVA variance analysis is used to analyze the differences of acdemic self-efficacy, learning burnout, social support, and learned helplessness in different grades. If the difference is significant, different verification methods will be selected for Post-hoc test, according to whether the verified variation homogeneity is identical or not. In this study, the Size of Effect η^2 value is used to represent the statistic of the independent variable to dependent variable. According to Cohen (1988), $0.059>\eta^2\geqq0.010$ represents a low effect, $0.138>\eta^2\geqq0.059$ represents medium effect, and $\eta^2\geqq0.138$ represents high effect.

4.3.1 Difference Analysis of the Variables in Vocational College Students between Different Genders

The independent sample *t* test is used to analyze the differences of acdemic self-efficacy, learning burnout, social support, and learned helplessness in gender. The results are shown in Table 4.6.

In terms of acdemic self-efficacy, there is no significant difference in acdemic self-efficacy between different genders in vocational college students (t=0.666, p=0.506), and the effect degree is d=0.041, showing almost no effect (Cohen, 1988).

In terms of learning burnout, there is a significant difference in the overall learning burnout of vocational college students in different genders (t=4.154, p=0.000<0.001), reaching a significant level of 0.001; the effect degree is d=0.256, showing a low effect degree (Cohen, 1988); the level of learning burnout in male students (mean=2.081) is significantly higher than that of female students (mean=1.895); in addition, there are significant differences among emotional exhaustion, negative attitude, and low achievement in learning burnout (t=3.856, 3.980, 3.622), all of which reach a significant level of 0.001, and the effect degree d is 0.112, 0. 245, 0.223, showing a small effect degree (Cohen, 1988); in the three dimensions, the learning burnout level of male students is significantly higher than that of female students, and this result is consistent with the findings of other researchers (Jan et al., 2014).

In terms of social support, there is a significant difference in the overall social support of vocational college students in different genders (t=-2.947, p=0.003<0.01), reaching a significant level; the effect degree is d=0.256, showing a

low effect degree. In terms of teacher support, no significant difference is found (t=0.858, p=0.391), not reaching a significant level; the effect degree is d=0.052, indicating that there is almost no difference. In terms of family support and student support, the t values are -3.881, 3.217, respectively, reaching a significant level; the effect degrees are 0.237, 0.197, indicating a low effect dgree. In the two demensions, the level of female students is significantly higher than that of male students, that is, female students have a higher awareness of supports from family and student in life than male students, which is consistent with the previous literature (Su, Li, Dong, 2016).

In terms of learned helplessness, there is a significant difference in the overall learned helplessness of vocational college students in different genders (t=2.504, p=0.012<0.05), reaching a significant level; d=0.153 represents a very low effect degree. In the behavioral helplessness, no significant difference is found (t=1.395, p=0.163), not reaching a significant level; the effect degree is d=0.085, indicating that there is almost no difference. In terms of cognitive helplessness, emotional helplessness, and attributional helplessness, the t values are 2.276, 2.073, and 3.092, which all reach significant levels; the effect degrees are 0.140, 0.127, and 0.190, showing a minimum effect degree. And in all the three demensions, it shows that the level of learned helplessness in male students is significantly higher than that of female students, that is, the level of learned helplessness in male students is higher than that in female students, which is consistent with the findings of other researchers (Jiang, 2018).

In summary, among the four variables of acdemic self-efficacy, learning burnout, social support, and learned helplessness, in addition to the level of

self-efficacy, there is no significant difference in gender, and there are significant differences in learning burnout, social support and learned helplessness for vocational students in different genders. As shown in Table 4.6.

Table 4.6 *t*-test Analysis Tables for Different Variables in Students between Different Genders

Dimension & Entirety	Mean (SD) Male (*n*=521)	Female (*n*=546)	*t*	*p*	*d*	Difference Comparison
Overall Self-Efficacy	3.308(.824)	3.278(.643)	0.666	.506	.041	-
Burnout	2.086(.815)	1.908(.683)	3.856***	.000	.121	Male>Female
Negative Attitude	2.054(.903)	1.849(.764)	3.980***	.000	.245	Male>Female
Low Achivement	2.097(.878)	1.919(.712)	3.622***	.000	.223	Male>Female
Overall Learning Burnout	2.081(.800)	1.895(.646)	4.154***	.000	.256	Male>Female
Family Support	3.596(.979)	3.810(.814)	-3.881***	.000	.237	Female>Male
Teacher Support	3.500(.994)	3.547(.784)	-0.858	.391	.052	-
Student Support	3.535(.974)	3.707(.751)	-3.217**	.001	.197	Female>Male
Overall Social Support	3.544(.896)	3.688(.687)	-2.947**	.003	.180	Female>Male
Cognitive Helplessness	2.613(.969)	2.487(.832)	2.276*	.023	.140	Male>Female
Emotional Helplessness	2.504(.927)	2.392(.832)	2.073*	.038	.127	Male>Female
Behavioral Helplessness	2.541(.982)	2.462(.879)	1.395	.163	.085	-
Attribution Helplessness	2.524(.952)	2.352(.857)	3.092*	.002	.190	Male>Female
Overall Learned Helplessness	2.548(.870)	2.423(.755)	2.504*	.012	.153	Male>Female

Notes: *p<0.05 **p<0.01 ***p<0.001

4.3.2 Difference Analysis of the Variables in Vocational College Students between Different Grades

The single factor ANOVA variation test was used to analyze the differences of acdemic self-efficacy, learning burnout, social support, and learned helplessness in different grades. As shown in Table 4.7.

In terms of acdemic self-efficacy, there is no significant difference in acdemic self-efficacy between different grades in vocational college students

(F=1.187, *p*=0.306>0.05), not reaching significant level. Hong, Huang and Qiu (2014) also find that there is no difference on the acdemic self-efficacy in vocational college students in different grades.

In terms of learning burnout, there is a significant difference in the overall learning burnout, emotional exhaustion, negative attitude and low achievement of vocational college students in different grades (F=11.133, 11.832, 8.862, 7.870), reaching a significant level of 0.001. Post-hoc test is perfomed after it is found in ANOVA analysis that there are significant differences in learning burnout and its dimensions. In this study, Levene test is performed on whether the variogram is homogenous. The *p* value is found to be greater than 0.05, which does not reach a significant level, indicating that the samples belong to homogenous variability. Post-hoc test comparison is verified using LSD test, it is found that the overall learning burnout, emotional exhaustion, negative attitude, and low achievement of sophomores and juniors are higher than those of freshmen; and that significant differences are not found in the levels of learning burnout and its demensions between sophomores and juniors.

In terms of social support, there is a significant difference in the overall social support of vocational college students in different grades (F=6.055), reaching a significant level of 0.01. Levene test is performed on whether the variogram is homogenous. The *p* value is found to be 0.044, which reaches a significant level (0.05), indicating that the samples belong to homogenous variability. Post-hoc test comparison is verified using Dunnett T3 method, it is found that the overall social support freshmen perceived is higher than that of sophomores and juniors; and that significant differences are not found in the levels of social support between

sophomores and juniors. In addition, there is a significant difference in the overall social support, family support, teacher support and student support of vocational college students in different grades. Levene test is performed on whether the variogram is homogenous. The *p* value is found to be 0.004 and 0.002 on family support and student support, which reach a significant level (0.01), indicating that the samples belong to homogenous variability. In is found in the Post-hoc test comparison using Dunnett T3 method, the family support level of freshmen is higher than that of sophomores; and significant differences are not found in the levels of family support among freshmen, sophomores and juniors. In terms of student support, the student support level of freshmen is higher than that of sophomores and juniors; and significant differences are not found in the levels of student support between sophomores and juniors. LSD test is performed on whether the variogram is homogenous. The *p* value is found to be 0.411 on teacher support, indicating that the samples belong to homogenous variability. The teacher support level of freshmen is higher than that of sophomores and juniors; and significant differences are not found in the levels of teacher support between sophomores and juniors.

In terms of learned helplessness, there is a significant difference in the overall learned helplessness, cognitive helplessness, emotional helplessness, behavioral helplessness and attribution helplessness of vocational college students in different grades (F=8.024, 6.999, 6.869, 5.894, 6.571), all reaching a significant level. Post-hoc test is perfomed after it is found in ANOVA analysis that there are significant differences in learned helplessness and its dimensions. Levene test is performed on whether the variogram is homogenous. The *p* value is found to be 0.05, not reaching a significant level, indicating that the samples belong to homogenous variability.

Post-hoc test comparison is verified using LSD, it is found that the overall learned helplessness, cognitive helplessness, emotional helplessness, behavioral helplessness and attribution helplessness sophomores and juniors perceived are higher than that of freshmen; and that significant differences are not found between sophomores and juniors. Emotional helplessness in junior is higher than that of freshmen; and significant difference is not found among freshmen, sophomores and juniors.

In summary, among the four variables of acdemic self-efficacy, learning burnout, social support, and learned helplessness, in addition to the level of self-efficacy, there is no significant difference in grade, and there are significant differences of learning burnout, social support and learned helplessness of vocational students in grade. As shown in Table 4.7.

Table 4.7 ANOVA Analysis Table for Different Variables in Students among Different Grades

Dimension & Entirety	Mean (SD) Grade 1 (n=293)	Grade 2 (n=438)	Grade 3 (n=336)	F Value	Post-hoc Comparison
Overall Self-Efficacy	3.346(.691)	3.285(.800)	3.257(.688)	1.187	-
Burnout	1.821(.692)	2.029(.774)	2.102(.759)	11.832***	2>1,3>1
Negative Attitude	1.777(.793)	1.997(.876)	2.037(.815)	8.862***	2>1,3>1
Low Achivement	1.849(.745)	2.060(.818)	2.073(.812)	7.870***	2>1,3>1
Overall Learning Burnout	1.818(.687)	2.031(.741)	2.073(.732)	11.133***	2>1,3>1
Family Support	3.821(.844)	3.638(.960)	3.694(.873)	3.646*	1>2
Teacher Support	3.706(.833)	3.487(.924)	3.414(.879)	9.138***	1>2,1>3
Student Support	3.738(.812)	3.593(.929)	3.563(.836)	3.652*	1>2,1>3
Overall Social Support	3.755(.757)	3.573(.844)	3.557(.761)	6.055**	1>2,1>3
Cognitive Helplessness	2.388(.850)	2.580(.927)	2.648(.900)	6.999**	2>1,3>1
Emotional Helplessness	2.315(.879)	2.438(.867)	2.574(.884)	6.869**	3>1

Table 4.7 (Continued)

Dimension & Entirety	Mean (SD) Grade 1 (n=293)	Grade 2 (n=438)	Grade 3 (n=336)	F Value	Post-hoc Comparison
Behavioral Helplessness	2.348(.880)	2.531(.945)	2.594(.943)	5.894**	2>1,3>1
Attribution Helplessness	2.283(.874)	2.458(.894)	2.541(.941)	6.571**	2>1,3>1
Overall Learned Helplessness	2.335(.793)	2.501(.815)	2.592(.817)	8.024***	2>1,3>1

Note 1: If the variability is homogenous, the post-mortem comparison is determined by LSD; if the variability is inhomogenous, the post-mortem comparison is performed using the Dunnett T3 method.

Note 2: $^{*}p<0.05$ $^{**}p<0.01$ $^{***}p<0.001$

Note 3: Grade Classification: "1"=Grade 1; "2"=Grade 2; "3"=Grade 3

4.3.3 Difference Analysis of the Variables in Vocational College Students between Different Student-Origins

The independent sample *t* test is used to analyze the differences in acdemic self-efficacy, learning burnout, social support, and learned helplessness of vocational college students in different student-origins. The results are shown in Table 4.8.

In terms of acdemic self-efficacy, there is no significant difference in the acdemic self-efficacy of vocational college students in different student-origins (t=-1.342, p=0.180), and the effect degree is d=0.106, almost having no effect (Cohen, 1988).

In terms of learning burnout, there is no significant difference in the overall learning burnout and emotional exhaustion, negative attitude and low achievement of vocational college students from different origins. The *t* values are respectively 1.293, -0.335, 0.953, 1.293, and the *p* values are all greater than 0.05. The effect degree (d) is within 0.027-0.102, almost no effect (Cohen, 1988). Wang and Miao (2012) also find

that the learning burnout in vocational college students does not differ between rural and urban areas.

In terms of social support, there is a significant difference in the family support of the vocational college students from different origins (t=-1.964, p=0.049), and the level of family support which urban vocational college students perceived (mean=3.822, SD=0.910) is higher than that of rural students (mean=3.680, SD=0.902), and the effect degree (d) is 0.156, which is minimal (Cohen, 1988). There is no significant difference in the overall social support of the vocational college students and other two deminsions (teacher support, student support); t is within 0.572-1.187, p value is greater than 0.05, and the effect degree (d) is within 0.046-0.095, almost no effect (Cohen, 1988).

In terms of learned helplessness, there is no significant difference in the overall learning helplessness, cognitive helplessness, emotional helplessness, behavioral helplessness, and attributional helplessness in vocational college students. The t values are -0.348, 0.337, -0.441, -0.550, -0.853, and the p values are all greater than 0.05. The effect degree (d) is within 0.026-0.065, almost no effect (Cohen, 1988).

In summary, there are no significant differences of acdemic self-efficacy, learning burnout, social support, and learned helplessness in vocational college students from different student-origins. As shown in Table 4.8.

Table 4.8 t-test Analysis Table for Different Variables in Students among Different Student-Origins

Dimension & Entirety	Mean (SD) Rural (n=876)	Mean (SD) Urban (n=191)	t	p	d	Difference Comparison
Overall Self-Efficacy	3.279(.732)	3.358(.755)	-1.342	.180	.106	-
Burnout	1.991(.753)	2.012(.767)	-0.335	.738	.027	-
Negative Attitude	1.961(.843)	1.897(.830)	0.953	.341	.077	-
Low Achivement	2.021(.798)	1.938(.817)	1.293	.196	.102	-
Overall Learning Burnout	1.993(.727)	1.953(.748)	0.696	.486	.054	-
Family Support	3.680(.902)	3.822(.910)	-1.964*	.049	.156	Urban>Rural

Table 4.8 (Continued)

Dimension & Entirety	Mean (SD)		*t*	*p*	*d*	Difference Comparison
	Rural (n=876)	Urban (n=191)				
Teacher Support	3.517(.894)	3.558(.886)	-0.572	.568	.046	-
Student Support	3.615(.874)	3.660(.861)	-0.642	.521	.051	-
Overall Social Support	3.604(.802)	3.680(.783)	-1.187	.236	.095	-
Cognitive Helplessness	2.553(.893)	2.529(.949)	0.337	.736	.026	-
Emotional Helplessness	2.442(.872)	2.473(.922)	-0.441	.659	.034	-
Behavioral Helplessness	2.493(.921)	2.534(.980)	-0.550	.583	.043	-
Attribution Helplessness	2.425(.891)	2.487(.986)	-0.853	.394	.065	-
Overall Learned Helplessness	2.480(.804)	2.503(.868)	-0.348	.728	.027	-

Notes: $^{*}p<0.05$ $^{**}p<0.01$ $^{***}p<0.001$

4.3.4 Difference Analysis of the Variables in Vocational College Students between Different Disciplines

The independent sample *t* test is used to analyze the differences in acdemic self-efficacy, learning burnout, social support, and learned helplessness of vocational college students in different disciplines. The results are shown in Table 4.9.

In terms of acdemic self-efficacy, there is no significant difference in the acdemic self-efficacy of vocational college students in different disciplines (t=-0.760, p=0.448), and the effect degree is d=0.047, almost no effect (Cohen, 1988).

In terms of learning burnout, there is no significant difference in the overall learning burnout and emotional exhaustion, negative attitude and low achievement of vocational college students from different disciplines. The *t* values are respectively -1.438, -1.958, -0.704, -1.235, and the *p* values are all greater than 0.05. The effect degree (*d*) is within 0.042-0.122, almost no effect (Cohen, 1988).

In terms of social support, there are significant differences in the family support of the vocational college students from different disciplines (t=2.053,

p=0.040), and the level of family support that vocational college students in arts perceived (mean=3.773, SD=0.878) is higher than that of students in science (mean=3.658, SD=0.920). There is no significant difference in the overall social support of the vocational college students and other two deminsions (teacher support, student support); *t* is within 0.145-1.124, *p* value is greater than 0.05, and the effect degree (*d*) is within 0.009-0.069, almost no effect (Cohen, 1988).

In terms of learned helplessness, there is no significant difference in the overall learning helplessness, cognitive helplessness, emotional helplessness, behavioral helplessness, and attributional helplessness in vocational college students from different disciplines. The *t* values were -1.024, -0.450, -1.030, -1.115, -1.238, and the *p* values are all greater than 0.05. The effect degree (*d*) is within 0.027-0.077, almost no effect (Cohen, 1988).

In summary, there are no significant differences of acdemic self-efficacy, learning burnout, social support, and learned helplessness in vocational college students from different disciplines. As shown in Table 4.9.

Table 4.9 *t*-test Analysis Table for Different Variables in Students from Different Disciplines

Dimension & Entirety	Mean (SD)		*t*	*p*	*d*	Difference Comparison
	Arts (*n*=442)	Science (*n*=625)				
Overall Self-Efficacy	3.272(.710)	3.307(.755)	-0.760	.448	.047	-
Burnout	1.941(.719)	2.033(.778)	-1.958	.050	.122	-
Negative Attitude	1.928(.855)	1.964(.831)	-0.704	.482	.042	-
Low Achivement	1.970(.785)	2.032(.813)	-1.235	.217	.077	-
Overall Learning Burnout	1.948(.716)	2.013(.741)	-1.438	.151	.089	-
Family Support	3.773(.878)	3.658(.920)	2.053*	.040	.128	Arts>Sciences
Teacher Support	3.529(.878)	3.521(.903)	0.145	.885	.009	-
Student Support	3.648(.850)	3.606(.887)	0.776	.438	.048	-
Overall Social Support	3.650(.763)	3.595(.823)	1.124	.261	.069	-

Table 4.9 (Continued)

Dimension & Entirety	Mean (SD) Arts (*n*=442)	Science (*n*=625)	*t*	*p*	*d*	Difference Comparison
Cognitive Helplessness	2.534(.869)	2.559(.927)	-0.450	.653	.027	-
Emotional Helplessness	2.414(.861)	2.470(.894)	-1.030	.303	.063	-
Behavioral Helplessness	2.463(.914)	2.527(.943)	-1.115	.265	.068	-
Attribution Helplessness	2.395(.886)	2.465(.923)	-1.238	.216	.077	-
Overall Learned Helplessness	2.454(.776)	2.505(.842)	-1.024	.306	.062	-

Notes: $^{*}p<0.05$ $^{**}p<0.01$ $^{***}p<0.001$

4.3.5 Difference Analysis of the Variables in Vocational College Students between Single-child Or Not

The independent sample *t* test is used to analyze the differences in acdemic self-efficacy, learning burnout, social support, and learned helplessness of vocational college students in single-child or not. The results are shown in Table 4.10.

In terms of acdemic self-efficacy, there is no significant difference in the acdemic self-efficacy of vocational college students in single-child or not (*t*=-0.760, *p*=0.448), and the effect degree is *d*=0.099, almost no effect (Cohen, 1988).

In terms of learning burnout, there is no significant difference in the overall learning burnout and emotional exhaustion, negative attitude and low achievement of vocational college students in single-child or not. The *t* values are respectively 1.106, 1.263, 0.697, 1.137, and the *p* values are all greater than 0.05. The effect degree (*d*) is within 0.063-0.124, almost no effect (Cohen, 1988).

In terms of social support, there is a significant difference in the overall family support, and the dimensions like family support, teacher support and student support of the vocational college students in single-child or not (*t*=-1.310, -1.245, -1.164, -1.170, *p*>0.05), and the effect degree (*d*) is within 0.114-0.122, almost no

effect (Cohen, 1988).

In terms of learned helplessness, there is no significant difference in the overall learning helplessness, cognitive helplessness, emotional helplessness, behavioral helplessness, and attributional helplessness in vocational college students in single-child or not. The *t* values are 0.587, -0.053, 0.740, 0.653, 0.935, and the *p* values are all greater than 0.05. The effect degree (*d*) is within 0.005-0.092, almost no effect (Cohen, 1988).

In summary, there are no significant differences of acdemic self-efficacy, learning burnout, social support, and learned helplessness in single-child or not in vocational college students. As shown in Table 4.10.

Table 4.10 *t*-test Analysis Table for Different Variables in Students between Single-child Or Not

Dimension & Entirety	Mean (SD) Positive (*n*=135)	Negative (*n*=932)	*t*	*p*	*d*	Difference Comparison
Overall Self-Efficacy	3.221(0.921)	3.303(0.706)	-0.989	.324	.099	-
Burnout	2.083(0.884)	1.982(0.734)	1.263	.209	.124	-
Negative Attitude	1.996(0.872)	1.942(0.837)	0.697	.486	.063	-
Low Achivement	2.086(0.892)	1.995(0.788)	1.137	.216	.108	-
Overall Learning Burnout	2.059(0.840)	1.975(0.713)	1.106	.270	.107	-
Family Support	3.602(1.058)	3.721(0.879)	-1.245	.215	.122	-
Teacher Support	3.428(1.051)	3.538(0.867)	-1.164	.246	.114	-
Student Support	3.530(1.011)	3.637(0.849)	-1.170	.244	.114	-
Overall Social Support	3.520(0.949)	3.632(0.774)	-1.310	.192	.129	-
Cognitive Helplessness	2.544(1.029)	2.549(0.884)	-0.053	.958	.005	-
Emotional Helplessness	2.506(0.999)	2.439(0.863)	0.740	.460	.072	-
Behavioral Helplessness	2.556(1.068)	2.492(0.910)	0.653	.515	.065	-
Attribution Helplessness	2.516(1.087)	2.425(0.879)	0.935	.351	.092	-
Overall Learned Helplessness	2.528(0.940)	2.478(0.796)	0.587	.558	.057	-

Note: $^{*}p<0.05$ $^{**}p<0.01$ $^{***}p<0.001$

In summary, there are significant differences in the levels of academic self-efficacy, learning burnout, social support, and learned helplessness among vocational college students in different background variables; there are significant differences in the levels of learning burnout, social support, and learned helplessness among vocational college students in different genders and grades; there are significant differences in the levels of acdemic self-efficacy, learning burnout, social support, and learned helplessness of vocational college students in different student origins, disciplines and single-child or not. Therefore, the hypothesis H1 in this study is proved.

4.4 Correlation Analysis

In this study, Pearson correlation coefficient is used to analyze the correlation and the correlation degree among the four variables. Qiu (2010) concludes that the correlation coefficient (r)=0 means no correlation among the variables, r<0.1 means weak correlation, 0.1 ≦ r<0.4 means low correlation, 0.4 ≦ r<0.7 means moderate correlation, 0.7 ≦ r<1.0 means high correlation, and r=1.0 means complete correlation.

4.4.1 Correlation Analysis among Acdemic Self-Efficacy, Learning Burnout, Social Support and Learned Helplessness

Pearson correlation coefficient analysis show that acdemic self-efficacy is negatively correlated with learning burnout in low degree (r=-0.204, p=0.000); Learning self-efficacy is negatively correlated with learned helplessness in low degree (r=-0.181, p=0.000); social support is negatively correlated with learned helplessness

in low degree (r=-0.226, p=0.000), and learning burnout is positively correlated with learned helplessness in moderate degree (r=0.576, p=0.000). As shown in Table 4.11:

Table 4.11 Correlation Analysis Summary Table of Four Variables

Variable	1	2	3	4
1. Acdemic Self-Efficacy	1			
2. Learning Burnout	-.204***	1		
3. Social Support	.435***	-.303***	1	
4. Learned Helplessness	-.181***	.576***	-.226***	1

Note: *p<0.05 **p<0.01 ***p<0.001

4.4.2 Correlation Analysis among Acdemic Self-Efficacy, Learning Burnout, and Learned Helplessness

According to the Pearson correlation coefficient analysis on the correlation analysis between acdemic self-efficacy and all the dimensions of learning burnout, and the correlation coefficient between acdemic self-efficacy and energy exhaustion is -0.145 (p=0.000), that between acdemic self-efficacy and negative attitude is -0.195 (p=0.000), and that between acdemic self-efficacy and low achievement is -0.222 (p=0.000). The results show that there is a low negative correlation between academic self-efficacy and learning burnout's dimensions.

The correlation analysis between acdemic self-efficacy and all the dimensions of learned helplessness shows that the correlation coefficient (r) between acdemic self-efficacy and cognitive helplessness is -0.132 (p=0.000), that between acdemic self-efficacy and emotional helplessness is -0.149 (p=0.000), that between acdemic self-efficacy and behavioral helplessness is -0.210 (p=0.000), and that between acdemic self-efficacy and attribution helplessness is -0.191 (p=0.000), indicating that acdemic self-efficacy is negatively correlated with learned helplessness' dimensions in low degree.

The correlation analysis between the dimensions of learning burnout and the dimensions of learned helplessness shows that the correlation coefficient between low achievement and negative attitude is high (r=0.806). In order to avoid the deviation, it will be conducted for colinearity test in the regression analysis. The correlation coefficient (r) between energy exhaustion and cognitive helplessness is 0.421 (p=0.000), that between energy exhaustion and emotional helplessness is 0.451 (p=0.000), that between energy exhaustion and behavioral helplessness is 0.443 (p=0.000), that between energy exhaustion and attributional helplessness is 0.501 (p=0.000), that between negative attitude and cognitive helplessness is 0.451 (p=0.000), that between attitude and emotional helplessness is 0.479 (p=0.000), that between attitude and behavioral helplessness is 0.465 (p=0.000), that between negative attitude and attribution helplessness is 0.511 (p=0.000), tht between low achievement and cognitive helplessness is 0.459 (p=0.000), that between low achievement and emotional helplessness is 0.514 (p=0.000), that between low achievement and behavioral helplessness is 0.521 (p=0.000), and that between low achievement and attribution helplessness is 0.542 (p=0.000), indicating that the learning burnout has a moderate positive correlation with the all the dimensions of learned helplessness. As shown in Table 4.12:

Table 4.12 Correlation Analysis Summary Table among Acdemic Self-Efficacy, Learning Burnout and All the Dimensions of Learned Helplessness

Dimensions	1	2	3	4	5	6	7	8
1. Acdemic Self-Efficacy	1							
2. Energy Exhaustion	-.145***	1						
3. Negative Attitude	-.195***	.759***	1					
4. Low Achievement	-.222***	.727***	.806***	1				
5. Cognitive Helplessness	-.132***	.421***	.451***	.459***	1			
6. Emotional Helplessness	-.149***	.451***	.479***	.514***	.763***	1		
7. Behavioral Helplessness	-.210***	.443***	.465***	.521***	.687***	.755***	1	
8. Attribution Helplessness	-.191***	.501***	.511***	.542***	.713***	.803***	.782***	1

Note: $^{*}p<0.05$ $^{**}p<0.01$ $^{***}p<0.001$

4.4.3 Correlation Analysis between Social Support and All the Dimensions of Learned Helplessness

Pearson correlation coefficient analysis showed that there is a low negative correlation between social support and all the dimensions of learned helplessness. The correlation coefficient (r) between family support and cognitive helplessness is -0.168 (p=0.000), that between family support and emotional helplessness is -0.190 (p=0.000), that between family support and behavioral helplessness is -0.235 (p=0.000), that between family support and attribution helplessness is -0.240 (p=0.000); that between teacher support and cognitive helplessness is -0.137 (p=0.000), that between teacher support and emotional helplessness is -0.158 (p=0.000), that between teacher support and behavioral helplessness is -0.218 (p=0.000), that between teacher support and attribution helplessness is -0.213 (p=0.000), that between support and cognitive helplessness is -0.108 (p=0.000), that between student number and emotional helplessness is -0.180 (p=0.000), that between student support and behavioral helplessness is -0.198 (p=0.000), and that between student support and attribution helplessness is -0.242 (p=0.000). As shown in Table 4.13:

Table 4.13 Summary Table for Correlation between Social Support and All the Dimensions of Learned Helplessness

Dimensions	1	2	3	4	5	6	7
1. Family Support	1						
2. Teacher Support	.679***	1					
3. Student Support	.669***	.784***	1				
4. Cognitive Support	-.168***	-.137***	-.108***	1			
5. Emotional Support	-.190***	-.158***	-.180***	.763***	1		
6. Behavioral Support	-.235***	-.218***	-.198***	.687***	.755***	1	
7. Attribution Support	-.240***	-.213***	-.242***	.713***	.803***	.782***	1

Note: $^{*}p<0.05$ $^{**}p<0.01$ $^{***}p<0.001$

4.5 Regression Analysis

Regression analysis, based on the linear relationship, is use to further explore the relationship between interpretation and prediction between variables. In this part, linear regression and multiple regression analysis are used to understand the influence of acdemic self-efficacy, learning burnout on learned helplessness, the mediating role of learning burnout between acdemic self-efficacy and learned helplessness, and the moderating role of social support in acdemic self-efficacy and learned helplessness in vocational college students. According to Qiu (2010), the R^2 value is used to judge the explanatory power of the regression model, and the significance of F value is used to judge whether the R^2 value has explanatory power, and the β value of regression coefficient is used to judge the extent of influence.

In this study, there are significant differences in the levels of learning burnout, social support, and learned helplessness among vocational college students in different genders and grades. Therefore, in this study the background variables (gender, grade) are used as the control variables in regression models.

4.5.1 Regression analysis of acdemic self-efficacy on learned helplessness

Regression analysis is used to test the influence of acdemic self-efficacy on the learned helplessness in the vocational college students. In the regression model, the learned helplessness is set as the dependent variable, the academic self-efficacy is set as the independent variable, and the regression model that acdemic self-efficacy has effect on learned helplessness is established. In the regression, the demographic variables (gender, grade) are reorganized into dummy variables, and the female students and the juniors are selected as the control group. As shown in Table 4.14:

Table 4.14 Linear Regression Analysis Table for Acdemic Self-Efficacy and Learned Helplessness

	Dependent Variable: Learned Helplessness				
Control Variable	B	SE	β	*p*	VIF
Male	.120*	.049	.073*	.015	1.018
Grade 1	-.230***	.064	-.126***	.000	1.366
Grade 2	-.096	.058	-.058	.097	1.366
Independent Variable					
Acdemic Self-Efficacy	-.196***	.033	-.177***	.000	1.003
R^2			.051		
Adj R^2			.047		
F			14.224***		
df			3		

Note 1: *p<0.05 **p<0.01 ***p<0.001

Note 2: “Female Students” and “Grade 3” are selected in the control group.

Under the premise of controlling the demographic variables, the results showed that F=14.22, p=0.000, reaching a significant level, in which the standardized regression coefficient of acdemic self-efficacy is β=-0.177, p=0.000, indicating that the acdemic self-efficacy has negative influence on the learned helplessness. In this regression model, VIF is less than 10, indicating that there is no collinearity between the independent variables in the model (Myers, 1990). R^2=0.051 indicates that the testers’ self-efficacy can explain the 51% variation in learned helplessness. Through the above analysis, H2 is proved in this study: the acdemic self-efficacy of Chinese vocational vollege students has a significant negative impact on the learned helplessness.

4.5.2 Regression Analysis of Acdemic Self-Efficacy on Learned Burnout

Regression analysis is used to test the influence of acdemic self-efficacy on the learned burnout in vocational college students. In the regression model, the learned burnout is set as the dependent variable, the academic self-efficacy is set as the independent variable, and the regression model that acdemic self-efficacy has

effect on learned burned is established. In the regression, the demographic variables (gender, grade) are reorganized into dummy variables, and the female students and the juniors are used as the control group. As shown in Table 4.15:

Table 4.15 Linear Regression Analysis Table for Acdemic Self-Efficacy and Learned Burnout

Dependent Variable: Learned Burnout					
Control Variable	B	SE	β	*p*	VIF
Male	.176***	.044	.120***	.000	1.018
Grade 1	-.224***	.056	-.137***	.000	1.366
Grade 2	-.052	.051	-.035	.315	1.366
Independent Variable					
Acdemic Self-Efficacy	-.200***	.029	-.201***	.000	1.003
R^2			.074		
Adj R^2			.070		
F			21.185***		
df			3		

Note 1: * $p<0.05$ ** $p<0.01$ *** $p<0.001$

Note 2: “Female Students” and “Grade 3” are selected in the control group.

Under the premise of controlling the demographic variables, the results show that F=21.185, p=0.000, reaching a significant level, in which the standardized regression coefficient of acdemic self-efficacy is β=-0.0.201, p=0.000, indicating that the acdemic self-efficacy has negative influence on the learned burnout. In this regression model, VIF is less than 10, indicating that there is no collinearity between the independent variables in the model (Myers, 1990). R^2=0.074 indicates that the testers’ self-efficacy can explain the 7.4% variation in learned burnout. Through the above analysis, H3 is proved in this study: the acdemic self-efficacy of Chinese vocational vollege students has a significant negative impact on the learned burnout.

4.5.3 Regression Analysis of Learning Burnout on Learned Helplessness

Regression analysis is used to test the influence of learning burnout on the learned helplessness in the vocational college students. In the regression model, the

learned helplessness is set as the dependent variable, the learning burnout is set as the independent variable, and the regression model that learning burned has effect on learned helplessness is established. In the regression, the demographic variables (gender, grade) are reorganized into dummy variables, and the female students and the juniors are selected as the control group. As shown in Table 4.16:

Table 4.16 Linear Regression Analysis Table for Learned Burnout and Learned Helplessness

Dependent Variable: Learned Burnout					
Control Variable	B	SE	β	*p*	VIF
Male	.005	.041	.003	.895	1.031
Grade 1	-.094	.054	-.052	.080	1.385
Grade 2	-.065	.048	-.039	.181	1.367
Independent Variable					
Learning Burnout	.637***	.028	.571***	.000	1.035
R^2			.334		
Adj R^2			.332		
F			133.344***		
df			3		

Note 1: *p<0.05 **p<0.01 ***p<0.001

Note 2: “Female Students” and “Grade 3” are selected in the control group.

Under the premise of controlling the demographic variables, the results show that F=133.344, p=0.000, reaching a significant level, in which the standardized regression coefficient of acdemic self-efficacy is β=0.571, p=0.000, indicating that the learning burnout has positive influence on the learned helplessness. In this regression model, VIF is less than 10, indicating that there is no collinearity between the independent variables in the model (Myers, 1990). R^2=0.334 indicates that the testers’ learning burnout can explain the 33.4% variation in learned helplessness.

The effects of learning burnout on the learned helplessness is further examined (F=90.620, p=0.000), and the results reach a significant level, in which the standardized regression coefficients of emotional exhaustion, negative attitude and

low achievement are respectively (β=0.140, *p*=0.001), (β=0.144, *p*=0.002), and (β=0.335, *p*=0.000), indicating that the emotional exhaustion, negative attitude, and low achievement in learning burnout has positive influence on learned helplessness. In this regression model, the VIF is less than 10, indicating that there is no collinearity between the independent variables in the model (Myers, 1990). R^2=0.339 indicates that the emotional exhaustion, negative attitude, and low achievement of learning burnout can explain the 33.9% variation of learned helplessness. As shown in Table 4.17:

Table 4.17 Linear Regression Analysis Table for Learned Helplessness and All the Dimensions of Learned Burnout

	Dependent Variable: Learned Burnout				
Control Variable	B	SE	β	*p*	VIF
Male	.007	.041	.005	.857	1.032
Grade 1	-.101	.054	-.055	.060	1.389
Grade 2	-.071	.048	-.043	.143	1.370
Independent Variable					
Emotional Exhaustion	.151**	.044	.140**	.001	2.610
Negative Attitude	.140**	.045	.144**	.002	3.484
Low Achievement	.341***	.045	.335***	.000	3.136
R^2			.339		
Adj R^2			.335		
F			90.620***		
df			5		

Note 1: *p<0.05 **p<0.01 ***p<0.001

Note 2: “Female Students” and “Grade 3” are selected in the control group.

Through the above analysis, the hypothesis H4 in this study is proved: the learning burnout of Chinese vocational college students has a positive effect on learned helplessness.

4.5.4 Analysis of the Mediating Role of Learning Burnout between Acdemic Self-Efficacy and Learned Helplessness

Referring to the mediating effect test method proposed by Baron and Kenny (1986), the mediating effect should meet three conditions: A). The independent variable has a significant predictive effect on the dependent variable; B). The independent variable has a significant prediction on the mediating variable; C). The independent variation and the mediating variable are simultaneously added to the regression model to predict the dependent variable. The mediating variable has a significant prediction effect and the prediction effect of independent variation decreases significantly. After the decrease, if the independent variation has no prediction on the dependent variables, it is called complete mediating; if the independent variation still has a significant prediction on the dependent variable, it is called partial mediating.

Because there are significant differences in learning burnout, social support, and learned helplessness among vocational college students in different genders and grades, the background variables (gender, grade) are used as control variables in the regression model. The results show that in Model 1, F=14.22, p=0.000, reaching a significant level, in which the standardized regression coefficient of acdemic self-efficacy is (β=-0.177, p=0.000, R^2=0.051), indicating that the acdemic self-efficacy has a negative influence on learned helplessness, and the acdemic self-efficacy can explain the 5.1% variation of learning burnout. In this regression model, VIF is less than 10, indicating that in the model, there is no collinearity between the variables, so the Condition 1 is consistent. The acdemic self-efficacy has a negative predictive effect on the learned helplessness; in the Model 2, F=21.185,

p=0.000, reaching a significant level, and the standardized regression coefficient of acdemic self-efficacy is (β=-0.201, *p*=0.000, R^2=0.074), indicating that acdemic self-efficacy negatively affects learning burnout, and learn self-efficacy can explain the 7.4% variation in learning burnout. In this regression model, VIF is less than 10, indicating that there is no collinearity between the independent variables in the model. Therefore, Condition 2 is consistent, acdemic self-efficacy has a negative predictive effect on learning burnout; in Model 3, when acdemic self-efficacy and learning burnout are simultaneously put into the model, F=108.524, *p*=0.000, reaching significant level; the standardized regression coefficient of acdemic self-efficacy is (β=-0.065, *p*=0.011), and the standardized regression coefficient of learning burnout is (β=0.557, *p*=0.000), R^2=0.338, indicating that the self-efficacy has a negative influence on learned helplessness, while learning burnout has a positive influence on learned helplessness, and can explain 33.8% variation of learned helplessness. Compared with Model 2, the increase was 28.7%, and the normalization coefficient of acdemic self-efficacy decreases from (β=-0.177, *p*=0.000) to (β=-0.065, *p*=0.011), which is in accordance with Condition 3. Learning burnout has a significant impact on learned helplessness, while the standardized coefficient of acdemic self-efficacy declines, but there is still a predictive effect, indicating that learning burnout plays a part in mediating the effect of acdemic self-efficacy on learned helplessness. As shown in Table 4.18:

Table 4.18 Mediating Effect Analysis of Learning Burnout between Learning self-efficacy and Learned Helplessness

Item	Modle 1 Learned Helplessness	Modle 2 Learning Burnout	Modle 3 Learned Helplessness
Control Variable	Beta	Beta	Beta
Male	.073*	.120***	.007
Grade 1	-.126***	-.137***	-.050
Grade 2	-.058	-.035	-.039
Independent Variable			
Acdemic Self-Efficacy	-.177***	-.201***	-.065*
Mediating Variable			
Learning Burnout	-	-	.557***
R^2	.051	.074	.338
adj R^2	.047	.070	.335
$\triangle R^2$	-	-	.287
F	14.224***	21.185***	108.524***
df	3	3	4

Note 1: *p<0.05 **p<0.01 ***p<0.001

Note 2: “Female Students” and “Grade 3” are selected in the control group.

Sobel (1982) test is used to further test the mediating effect. According to the Sobel (1982) test mode, the unstandardized regression coefficient (Beta) of acdemic self-efficacy to learning burnout is -0.200, the standard deviation is 0.029, and that of learning burnout to learned helplessness is 0.637, and the standard deviation is 0.028. The results show that learning burnout plays a significant mediating effect in the effect of acdemic self-efficacy on learned helplessness (t=-6.600, p=0.000). Therefore, the mediating effect is further verified. As shown in Table 4.19:

Table 4.19 Sobel Analysis Table for the Mediating Effect of Learning Burnout

Independent Variable	a	Sa	b	Sb	t	p
Acdemic Self-Efficacy	-0.200	-0.029	0.637	0.028	-6.600	0.000

The above analysis has proved the hypothesis H5 in this study: the learning burnout of Chinese vocational college students has a mediating effect on the influence of acdemic self-efficacy on learned helplessness.

4.5.5 Regression Analysis of the Mediating Role of Social Support between Acdemic Self-Efficacy and Learned Helplessness

Referring to the test method for mediating effect proposed by Baron and Kenny (1986), the mediating effect should meet three conditions: 1) The independent variable has a significant predictive effect on the dependent variable; 2) The mediating variable has a significant prediction on the dependent variable; 3) The interaction variable of the independent variable and mediating variable has a significant predictive effect on the dependent variable. In order to avoid the high collinearity caused by excessive prediction variable and excessive interaction variable, and referring to Aiken, West and Reno (1991), the values of independent variable and mediating variable are linearly shift to 0, and then the product is calculated. The variable inflation factor (VIF) is used as a collinearity indicator. If the VIF value is greater than 10, it means that there is a significant collinearity between the variables (Myers, 1990).

Because there are significant differences in learning burnout, social support, and learned helplessness among vocational college students in different genders and grades, the background variables (gender, grade) are used as control variables in the regression model. The results of hierarchical regression test analysis are shown in Table 4.20: Under the premise of controlling the background variables (gender and grade), in Model 1, acdemic self-efficacy has a 5.1% explanation for the learned helplessness, $F(4,1062)=14.24$, $p=0.000$; in Model 2, after inputing mediating variable

(social support), the joint explaination is 7.3% for learned helplessness, F(1,1061)=16.656, *p*=0.000. In Model 3, after inputting the interaction variable, the explanation increases 4.6%, with a total explanation of 11.9%, F(1,1060)=23.852, *p*=0.000; in regression Model 3, VIF is within 1.034-1.375, all less than 10, indicating that there is no collinearity with each other among acdemic self-efficacy, social support, acdemic self-efficacy and social support are, as shown in Table 4.20:

Table 4.20 Analysis of Mediating Effect of Social Support between Learning Self-Efficacy and Learned Helplessness

Item	Modle 1	Modle 2	Modle 3	
	Learned Helplessness (Dependent Variable)			VIF
Control Variable	Beta	Beta	Beta	
Male	.073*	.058	.074*	1.034
Grade 1	-.126***	-.113**	-.107**	1.375
Grade 2	-.058	-.056	-.058	1.366
Independent Variable				
Acdemic Self-Efficacy	-.177***	-.105***	-.131***	1.253
Mediating Variable				
Social Support	-	-.166***	-.183***	1.264
Interaction Variable				
Interaction Variable of Acdemic Self-Efficacy and Social Support			-.219***	1.035
R^2	.051	.073	.119	
adj R^2	.047	.068	.114	
$\triangle R^2$	-	-	.046	
F	14.224***	16.656***	23.852***	
df	3	4	5	

Notes 1: * $p<0.05$ ** $p<0.01$ *** $p<0.001$

Notes 2: “Female Students” and “Grade 3” are selected in the control group.

Table 4.20 shows that in Model 3, acdemic self-efficacy negatively predicts learning helplessness (β=-0. 131, *p*=0.000), social support negatively predicts learning helplessness (β=-0.183, *p*=0.000), and the interaction variable of acdemic self-efficacy and social support negatively predicts learned helplessness (β=-0.219, *p*=0.000), indicating that social support has mediating effect between acdemic self-efficacy and learned helplessness.

An interaction figure is drawn in this study to understand the role of social support in acdemic self-efficacy and learned helplessness, and slope is obtained based on the above data (Chao, Wei, Good & Flores, 2011; Aiken, West, & Reno, 1991). The results in Figure 4.1 show that students with low self-efficacy are more likely to encounter learned helplessness than those with high self-efficacy, regardless of high levels of social support or low levels of social support. Du, Zhao, You and Zhang (2012) also find that students with high self-efficacy have more confidence in learning, can effectively organize and maintain a positive learning attitude. Putwain and Symes (2014) also find that with the increase of individuals' academic self-efficacy, a negative mentality such as helplessness disappears. Therefore, it is recommended that education managers encourage students in daily education management to establish a good teacher-student relationship so that students full-fill confidence. At the same time, it is also found in the study that the social support perceived by vocational college students plays a positive role in the influence of acdemic self-efficacy on learned helplessness, that is, students with high level of social support performs better than students with low level of social support in inhibiting learned helplessness. As the level of acdemic self-efficacy increases, students with high social support are more conspicuous in suppressing learned helplessness than students with low social support. Generally, under the premise of obtaining higher social support level, the high acdemic self-efficacy has more obvious effect in relieving the learned helplessness. This is consistent with Bandura's (1986) Theory of Social Interaction, and factors affecting learning are susceptible to interactions between individuals and contextual factors. Russell et al. (2016) also believe that as an external factor in the individuals' living environment, social support often interacts with personal cognitive

factors (such as acdemic self-efficacy) and plays a regulatory role in the physical and mental health of individuals. In summary, the results of this study, in addition to enriching the Theory of Social Interaction, also have certain guiding significance for education management: support and care from family members, teachers and classmates are important parts of the social support in vocational college students. The important support given during the growth of vocational college students can stimulate their learning behavior to be more active. In the actual education management activities, in addition to cultivating the self-efficacy of vocational students, we can also improve the support from family members, teachers and classmates to improve the positive emotions and behaviors of vocational college students, so as to avoid learned helplessness. Students with high levels of social support perform better than students with low levels of social support in suppressing learned helplessness. As the level of self-efficacy increases, students with high social support levels are lower than those with low social support levels. It is more obvious in suppressing the effect of learned helplessness.

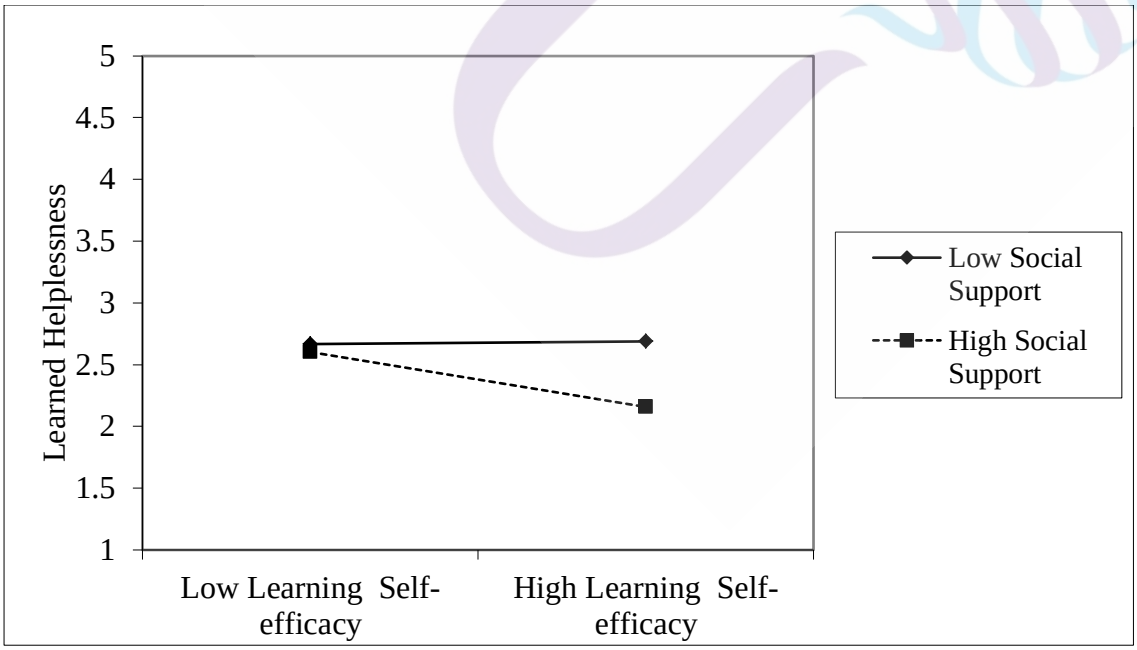

Figure 4.1 Mediating Effect Figure of Social Support

The above analysis has proved the hypothesis H6 proposed in this study: the social support of vocational college students in Henan Province of China has a mediating effect on the influence of acdemic self-efficacy on learned helplessness.

4.6 Answer Statement for Research Questions

4.6.1 Answer to Question 1

After statistical analysis of the data, the answer to the first question of this study is obtained:

First of all, in terms of gender, there is no significant difference in the academic self-efficacy among vocational college students in different genders; there are significant differences in learning burnout among vocational students of different genders, and the level of learning burnout in male students is significantly higher than that of female students. There are significant differences in the social support of vocational college students in different genders, and the level of social support perceived by female students is significantly higher than that of male students; there are significant differences in the learned helplessness of vocational college students in different genders, and the level of learned helplessness of male students is higher than that of female students.

Second, in terms of grade, there is no significant difference in the academic self-efficacy among vocational college students in different grades. There is a significant difference in the overall learning burnout among vocational college students in different grades. Post-hoc tests find that the overall level of learning burnout in sophomores and juniors is higher than that in freshmen; there is no

difference on the level of learning burnout between sophomores and juniors. There is a significant difference in the overall social support level of vocational college students in different grades. Afterwards, it is found that the overall social support level perceived by freshmen is higher than that of sophomores and juniors, and there is no difference between them. Higher vocational students in different grades have significant differences in the overall learned helplessness. After Post-hoc tests, it is found that the overall learned helplessness level of sophomores and juniors is significantly higher than that of freshmen, and there is no significant difference in the learned helplessness between sophomores and juniors.

Thirdly, in terms of student-orignin, there is no significant difference in acdemic self-efficacy among vocational college students in different higher student origins; there is no significant difference in the overall learning burnout level of vocational students from different student sources; and the overall social support level of vocational college students from different student sources; there is no significant difference in the overall learned helplessness level among vocational college students from different sources; there are no significant differences in acdemic self-efficacy, learning burnout, social support, and learned helplessness among vocational college students in different student sources.

In addition, there are no significant differences in acdemic self-efficacy, learning burnout, social support, and learned helplessness among vocational college students in different disciplines.

At last, there are no significant differences in acdemic self-efficacy, learning burnout, social support, and learned helplessness among vocational college students in terms of single-child or not.

4.6.2 Answer to Question 2

It is found in statistical regression analysis that the acdemic self-efficacy of Chinese vocational college students has a significant negative influence on the learned helplessness. That is, higher academic self-efficacy level of vocational college students suggests lower learned helplessness.

4.6.3 Answer to Question 3

It is found in statistical regression analysis that the acdemic self-efficacy of Chinese vocational college students has a significant negative influence on the learning burnout. That is, higher academic self-efficacy level of vocational college students suggests lower learning burnout.

4.6.4 Answer to Question 4

It is found in statistical regression analysis that the learning burnout of Chinese vocational college students has a significant negative influence on the learned helplessness. That is, higher learning burnout level of vocational college students suggests lower learned helplessness.

4.6.5 Answer to Question 5

It is found in statistical regression analysis that the acdemic self-efficacy of Chinese vocational college students will indirectly affect learned helplessness through learning burnout. That is, learning burnout plays a mediating role between acdemic self-efficacy and learned helplessness.

4.6.6 Answer to Question 6

Statistical regression analysis finds that the effect of acdemic self-efficacy of Chinese vocational students on learned helplessness would be regulated by social support. And students with high social support level perform better than students with

low social support level in inhibiting learned helplessness; as the acdemic self-efficacy level increases, students with high social support level are more likely to inhibit learned helplessness than students with low social support level.

4.7 Verification Results of Hypothesis

According to the statistical analysis of the research data, the following research conclusions can be summarized for the hypothesis of this research, as shown in Table 4.21:

Table 4. 21 Summary Table of Hypothesis Verification Results

Hypothesis	Verification Results
H1: Different background variables have significant differences in acdemic self-efficacy, learning burnout, social support, and learned helplessness.	Partially Confirmed
H2: Learning self-efficacy of Chinese vocational college students has a significant negative impact on learned helplessness.	Confirmed
H3: Learning self-efficacy of Chinese vocational college students has a significant negative impact on learning burnout.	Confirmed
H4: Learning burnout of Chinese vocational college students has a significant positive impact on learned helplessness.	Confirmed
H5: Learning burnout of Chinese vocational college students plays a mediating role in the influence of acdemic self-efficacy on learned helplessness.	Confirmed
H6: Social support of Chinese vocational college students plays a regulatory role in the influence of acdemic self-efficacy on learned helplessness.	Confirmed

In summary, based on the hypothesis in Chapter 3, independent sample *t*-tests or single-factor ANOVA variances are used in this chapter to statistically analyze the differences between variables in different background variables; linear regression analysis is used to further explore the explaination and prediction between variables; a regression model is established, referring to the test method of mediating effect and regulating effect proposed by Baron and Kenny (1986), and the mediating

role of learning burnout between acdemic self-efficacy and learned helplessness, and the moderating role of acdemic self-efficacy and learned helplessness are respectively tested. The results show that: (1) in terms of background variables, there are differences in learning burnout (t=4.154, p=0.000), social support (t=-2.947, p=0. 003), and the learned helplessness (t=2.504, p=0.012) of vocational college students in different genders; in terms of grades, there are differences in learning burnout (F=11.133, p=0.001), social support (F=6.055, p=0. 010), and the learned helplessness (F=8.024, p=0.000) of vocational college students in different grades; (2) acdemic self-efficacy of Chinese vocational college students is significantly negative to leaned helplessness (β=-0.177, p=0.000); (3) acdemic self-efficacy of Chinese vocational college students has a significant negative impact on learning burnout (β=-0.201, p=0.000); (4) learning burnout in Chinese high vocational students has a significant positive impact on learned helplessness (β=0.571, p=0.000); (5) learning burnout of Chinese vocational college students plays a mediating role in the effect of acdemic self-efficacy on learned helplessness (β=0.557, p=0.000); and the standardized coefficient of acdemic self-efficacy reduces from (β=-0.177, p=0.000) to (β=-0.065, p=0.011), indicating that learning burnout plays a partial mediating role in the effect of acdemic self-efficacy on learned helplessness; (6) social support of Chinese vocational college students plays a moderating role in the effect acdemic self-efficacy on the learned helplessness (β=-0.219, p=0.000).

CHAPTER 5

ANALYSIS AND DISCUSSION

After item analysis, exploratory factor analysis, and reliability analysis of the pre-test questionnaires, and confirmatory factor analysis and reliability analysis of the formal questionnaires, it is revealed that the Questionnaire for Learning Situation in Higher Vocational College Students which is composed of acdemic self-efficacy scale, learning burnout scale, social support scale, and learned helplessness scale is of good reliability and validity. In this chapter, first, the current state of academic self-efficacy, learning burnout, social support, and learned helplessness will be stated; then the differences in the research variables under different background variables, the correlations between the variables, and the effects of academic self-learning efficacy, learning burnout on learned helplessness, and the effect of acdemic self-efficacy on learning burnout among vocational students are summarized; finally, the mediating role of learning burnout in the effect of acdemic self-efficacy on learned helplessness in vocational college students, and the moderating role of social support in the effect of acdemic self-efficacy on learned helplessness are discussed.

5.1 Current Situation and Differences Discussion of Academic Self-Efficacy, Learning Burnout, Social Support and Learned Helplessness in Vocational College Students

5.1.1 Current Situation and Differences Discussion of Academic Self-Efficacy in Vocational College Students

It can be seen from the results that the average level of overall self-efficacy of vocational college students is higher than the medium value (3), which is a middle-to-high degree, indicating that the vocational college students in Henan Province have confidence in capacities and learning methods to some extent when dealing with college studies.

By analyzing different background variables (gender, grade, student origin, discipline, single-child or not), it is found in analyzing the discrepant data of acdemic self-efficacy in vocational college students that there is no difference in academic self-efficacy levels between male students and female students, which is consistent with some studies (Liao, 2011; Hong, Huang, & Qiu, 2014; Ersanli, 2015); the acdemic self-efficacy in vocational college students does not vary by grade, which is consistent with some other researchers (Hong, Huang, & Qiu, 2014); there is no difference in acdemic self-efficacy between rural and urban vocational college students, which is consistent with other findings (Wang & Miao, 2012); there is no difference in acdemic self-efficacy whether the students are single-child or not, which is consistent with the literature review (Liao, 2011), and indicates that vocational college students in Henan Province have commonality in their learning ability and confidence, but this result is also inconsistent with some other researchers, such as Wang and Miao (2012), who find that the acdemic self-efficacy of male college students is significantly higher than that of female college students; Caprara, Vecchione, Alessandri, Gerbino and Barbaranelli (2011) find that the higher the students' grade, the stronger their level of acdemic self-efficacy; Li and Chen (2012) find that, in terms of interpersonal relationships, the level of academic self-efficacy of college students (single-child) is significantly lower than that of college students

(non-single-child). The reason for the different results is that the measurement of acdemic self-efficacy in this study is based on the general self-efficacy and non-discipline acdemic self-efficacy of vocational college students in Henan Province. Therefore, this inconsistent result may be due to the certain aspects of acdemic self-efficacy, different tasks, or different research objects (Hong, Huang, & Qiu, 2014).

5.1.2 Current Situation and Differences Discussion on Learning Burnout in Vocational College Students

From the results of descriptive statistics on the overall learning burnout of vocational college students, it can be seen that the overall learning burnout of vocational college students and their three aspects (emotional exhaustion, negative attitude, low achievement) are at a medium level, indicating that generally the level of learning burnout in vocational college students is not very high, but learning burnout still exist in some vocational college students. The average score of low achievement is higher than that of the other two aspects, indicating that vocational college students lack learning motivation and it is difficult to produce achievement even if progress is made. Their low achievement is relatively significant, which is consistent with other research results (Song & Luo, 2018).

By analyzing the data of learning burnout in vocational college students with different background variables, it can be seen that the research results of different background variables in learning burnout are inconsistent in vocational college students.

It is found in this study that the learning burnout of vocational college students is different due to gender differences, and that the degree of learning burnout

of male students is higher than that of female students, which is consistent with the results of some researchers (Jia et al. 2014; Wu et al. 2016; Xiong & Fang, 2017), but also inconsistent with other findings (Sun & Lu, 2014; Song & Luo, 2018; Galán, Sanmartín, Polo, & Giner, 2011; Salmela & Tynkkynen, 2012). The reasons for different research results are caused by different research groups or research aspects. In this study, the overall learning burnout level and the levels of their three aspects (energy exhaustion, negative attitude, low achievement) in male students are all higher than that of female students. The reason may be that male and female students in higher vocational colleges in Henan Province have different learning psychology. On the one hand, male students are generally inferior to female students in their studies. In the face of learning difficulties and employment pressure, male students conduct more negative responses than female students. Male students are more prone to burnout manifestations such as unclear learning goals, lack of concentration, lack of interest in majors, and learning weariness (Jia et al., 2014). On the other hand, male students are easily attracted by external things (such as mobile phones, games, after-school activities, etc.) (Liu, Zhu, & Bai, 2014), so it is difficult to maintain long-term enthusiasm in learning, which is expressed as occational desire to learn but feeling very hard and bored to do so, often dozing in class, preferring to spend spare time on mobile phones or sports, hating exams rather than participating in learning activities (Xiong & Fang, 2017), so it is difficult to get better grades. As a result, the sense of achievement is low, leads to a serious rejection to learning, and eventually shows more serious learning burnout.

In terms of grades, it is found in Post-hoc test that the overall learning burnout and the levels of emotional exhaustion, negative attitude, and low

achievement in the sophomores and juniors are higher than those in the freshmen; There is no difference in the level of learning burnout, which is different from the findings of other researchers (Yang et al., 2014; Sun, Lu, 2014; Song & Luo, 2018). The reason is that with the growth of grades, sophomores and juniors have losen enthusiasm for learning (Zhu, 2009). Some students are numb to learning and are not willing to participate in any learning activities. This state will last from sophomore to junior, so the level of learning burnout between sophomores and juniors is similar.

In terms of student-origion, it is found in this study that no matter the vocational college students come from rural or urban areas, there are no differences in their overall learning burnout and the levels of emotional exhaustion, negative attitude, low achievement, which is different from other findings (Xiao & Xu, 2011; Xiong & Fang, 2017; Lu et al., 2016). The reason is that with the construction of urban-rural integration, the learning situations of rural and urban students are almost equivalent. Therefore, they have the same learning mentality in learning problems.

In terms of disciplines, it is found in this study that there is no difference in the overall learning burnout and the levels of emotional exhaustion, negative attitude, and low achievement among the vocational college students no matter in arts or science, which is consistent with literature based on vocational college students (Guo, 2010), but also different from other findings (Gao, 2013; Yang, Gao, Li, Gong, Hu, & Wen, 2013; Song & Luo, 2018; Zhao, 2016). The reason is that the learning situations for students of all majors in higher vocational colleges are basically the same, and they have the same mentality in learning problems. So, the reason for the different research results is due to different research objects or research aspects.

In terms of single-child or not, it is found in this study that there is no

difference in the overall learning burnout and the levels of emotional exhaustion, negative attitude, and low achievement among the vocational college students no matter in single-child or not, which is different from some findings (Jia, 2014; Zhao, 2016). The reason is that with the emergence of sub-replacement fertility in family (Jiao & Li, 2017), children's growing environment and learning mentality are almost equivalent. So, the reason for the different research results is due to different research objects or research aspects.

5.1.3 Current Situation and Difference Discussion of Social Support in Vocational College Students

From the overall descriptive statistics of social support for vocational college students, it can be seen that the scores of social support from family, teachers, and classmates for vocational college students in Henan Province are all at a moderately high level, indicating that the vocational college students has perveived greater support from the family, teachers, classmates. However, the levels of social support from different sources are different for vocational college students. Among them, the level of family support is the highest. This is consistent with the results of a survey on the perception of social support by vocational college students (Liu, Zhu, & Bai, 2014). This may be caused by the declining birthrate of Chinese family (Jiao & Li, 2017). Higher vocational students are at the stage of growth, and they are more dependent on their parents. Parents also pay more attention to their lives. Therefore, vocational college students have perceived the most support from their families. Similarly, vocational college students also feel supports from classmates, friends, and teachers. Among them, the support from teachers is relatively low. It may be caused by the little interaction between teachers and students in colleges.

In addition, it can be seen from the social support data of vocational college students with different background variables that there are inconsistent research results in social support.

In terms of gender, it is found in this study that the family and student support levels of female students are higher than that of male students, and that there is no difference in teacher support. That is, female students are more likely to perveive family support and student support than male students, which is consistent with the previous findings (Su, Li, & Dong, 2016; Zhang, Zhang, & Li, 2015). But, there are also some inconsistent findings by other researchers (Liu & Wang, 2018; Henry et al., 2019). The reason is that compared with male students, female students are more expressive than male students, their feelings are more delicate, and they are more sensitive to other's respect and understanding, more willing to ask others for help and talk to their classmates. Generally, female students are believed to be weak and their families always provide them more protection and supports, so female students are more likely to get more social support and emotional experience than male students.

In terms of grade, the levels of total social support and the perceived supports from family and classmates of freshmen are higher than that of sophomores and juniors, which is inconsistent with many other findings (An, Zhang, & Shi, 2013; Huang & Li, 2014; Ma & Lin, 2006). The reason may be that the freshmen have just entered a new environment and their families pay more attention and support on them. For the freshmen from various places, in the first year, they help each other and build a closer relationship (Liu & Chen, 2013); but, as the grades increase, each of them has his own idea and narrows his life circle, so they can't feel as much support as before

(Liu, Zhu, & Bai, 2014). As students are more and more familiar with the living environment, family members gradually begin to pay less attention. So, the reason for the different research results is caused by the difference in regional cultural background or education management.

In terms of student origin, it is found in this study that there is no difference in the overall social support of vocational students from different student origins. The level of family support is consistent with the findings of Wu and Liang (2010). However, it is also inconsistent with some other researchers (Li, 2010; Qiu & Dai, 2014). The reason may be that the income of urban residents in urban-rural dual economic structure is generally higher than that of rural residents (Bida, 2019); thus, compared with rural families, vocational college students from urban families can receive more material support.

In terms of discipline, there is no difference in the levels of the overall social support, teacher support, and student support of vocational college students in arts or science. The family support level of vocational college students in arts is higher than that of students in science, which is partially consistent with some research by An, Zhang and Shi (2013). But, this research also has inconsistent findings with some other researchers (Liu & Wang, 2018; Shao, & Hu, 2018; Henry et al., 2019), because students in arts are better at expressing emotions than students in science and more willing to spend more time to communicate with family members (Osmanthus, Zhang, & Shi, 2013). Therefore, the level of perceived family support of students in arts is higher than that of students in science.

In terms of whether they are single-child or not, it is found in this study that the levels of overall social support and other support perceived by vocational students

of single-child and non-single-child are equivalent, which is consistent with the findings of Wu and Liang (2010). But it is also inconsistent with some other findings (Huang & Li, 2014; Li, 2010; Wang, Su, & Zhu, 2008), and the reason may be the declining of birthrate in family (Jiao & Li, 2017); thus, in children's growth the living environment and learning mentality are almost the same, so they feel the same support from families and those around them. Therefore, the reason for the different research results is the different research objects or research areas.

5.1.4 Current Situation and Difference Discussion on Learned Helplessness in Vocational College Students

From the descriptive statistics of learned helplessness in vocational college students, it can be seen that the overall learned helplessness of vocational college students and its four dimensions (cognitive helplessness, behavioral helplessness, emotional helplessness, attribution helplessness) are at a medium level. It shows that although the level of learned helplessness of vocational college students is not very high, some vocational college students still live with the learned helplessness. The average scores of cognitive helplessness and behavioral helplessness are relatively higher than the other two dimensions, indicating that vocational college students have mistakes in learning cognition, lack confidence in learning ability and endurance. They often attribute the cause of failure to their own unchangeable factors, and then give up trying. For example, in the learning process, vocational college students believe that the poor academic performance is due to poor intelligence, and they have no way to change and improve their negative mentality no matter how hard they work.

In addition, it can be seen from the data of learned helplessness in

vocational college students with different background variables that there are inconsistent research results in social support.

In terms of gender, it is found in this study that there is no difference in the learned helplessness of higher voacational students in different genders, and that there are differences in overall learned helplessness, cognitive helplessness, emotional helplessness and attribution helplessness of higher voacational students in different genders. And the level of learned helplessness in male students is higher than that in female students, which is consistent with some other findings (Jiang, 2018; Valås, 2001). But, there are also some inconsistent findings by other researchers (Wang & Zhang, 2013; Sortrenti, Filippello, Costa, & Buzzai, 2015). The reason is that the research objects and areas are different. In this study, the overall learned helplessness and the three dimensions (cognitive helplessness, emotional helplessness, and attribution helplessness) in male students were higher than that of female students; the reason is that, in vocational college students in Henan Province, male students and female students have different cognition and learning psychology in facing learning problems. After experiencing setbacks in learning, female students are generally more patient than male students. Conversely, male students have more negative emotions than female students, and are more likely to conduct wrong evaluations on their learning ability. In addition, vocational college students are still in the period of growth, male students are later to be mature than female students (Jiang, 2018). Without effective intervention and guidance, cognitive fixation and psychological barriers are prone to occur, showing low learning willingness motivation. Regarding the discipline of teachers' or parents', male vocational students in the growing stage are more likely to have adverse emotions than female students, attribute the learning

failure to external causes, such as teacher-student relationships or family relationships (Liu & Chen, 2013), and ultimately are unlikely to treat learning with a rational, scientific and positive attitude.

In terms of grades, it is found in post-hoc test that the overall learned helplessness and its three dimensions (cognitive helplessness, behavioral helplessness and attribution helplessness) of sophomore and junior vocational students are higher than those of freshmen; There is no difference in the level of learned helplessness between the sophomores and juniors, which is different from the findings of other researchers (Jiang, 2018; Wen, 2014). The reason is that most of the vocational students have a poor learning foundation, and they may plan to study well when they enter the college, but they always fail to insist because of their poor learning foundation, unsolid knowledge basis, and the weak professional ability (Jia, Wang, & Dai, 2014); with the growth of grades, more learning difficulties are encountered, and they feel that effort does not equal progress; vocational college students are in the period of personality development, they are more fragile, easier to lose self-confidence, and are afraid to face learning failure, so their low learning motivation and learning emotions eventually lead to self-protection and helplessness (Val ås, 2001), which will last till the third grade.

In terms of student origin, it is found in post-hoc test that there is no difference in the levels of the overall learned helplessness and its three dimensions (cognitive helplessness, behavioral helplessness and attribution helplessness) of vocational college students from different student origins, which is consistent with the literature review (Li, 2017). However, it is also different from the findings of other researchers (Wang, 2014; Wen, 2014; Wu & Zeng, 2012). The reason is that, with the

integration of urban and rural areas, the learning environment of rural and urban students is almost equivalent, so they have equivalent learning mentality when facing learning problems. The reasons for inconsistent research results may be due to the differences of research areas and objects.

In terms of disciplines, it is found in this study that there is no difference in the levels of the overall learned helplessness and its three dimensions (cognitive helplessness, behavioral helplessness and attribution helplessness) of vocational college students between arts and science, which is consistent with the literature review (Wu & Zeng, 2012). But there is also difference from the findings of other researchers (Jiang, 2018; Wen, 2014). The reason is that vocational college students no matter in arts or science have the similar learning environments, and that they also have similar learning mentality in facing learning problems. So, the reason for the different results is due to different research objects and areas.

In terms of single-child or not, it is found in this study that there is no difference in the levels of the overall learned helplessness and its three dimensions (cognitive helplessness, behavioral helplessness and attribution helplessness) of vocational college students no matter single-child or not, which is consistent with the literature review (Li, 2017). But there is also difference from the findings of other researchers (Chen, 2012). The reason is that vocational college students have similar growing situations and learning mentality because of the sub-replacement fertility. So, the reason for the different results is due to different research objects and areas.

5.2 Influence of Academic Self-Efficacy, Learning Burnout, Social Support and Learned Helplessness in Vocational College Students

5.2.1 Influence of Academic Self-Efficacy on Learned Helplessness in Vocational College Students

It is found in this study that there is a negative influence of acdemic self-efficacy on learned helplessness in vocational students. That is, higher acdemic self-efficacy indicates lower learned helplessness. The reason is vocational college students with lower self-efficacy are often skeptical about their ability to complete a learning task (Zhang & Chen, 2007). Before performing a learning task, instead of striving for success, they focus on the possible failure of the task. When facing setbacks, they often lose confidence, give up without hard trying, and finally perceive learned helplessness (Putwain & Symes, 2014). In other words, students with a higher acdemic self-efficacy are more confident in learning and more motivated to learn, and thus avoiding learned helplessness. Du et al. (2012) also argues that students with high self-efficacy are more confident in learning, can effectively organize learning, and always maintain a positive learning attitude and mentality, thereby avoiding negative learning attitudes and mentality such as learned helplessness. This result is consistent with the findings of other researchers (Dai, 2013; Putwain & Symes, 2014).

Meanwhile, according to the Social Cognitive Theory by Bandura (1977, 1986), students with low self-efficacy always tend to have a pessimistic view of self-achievement, and are often accompanied by negative psychology or emotions such as depression and anxiety. In other words, the vocational students' acdemic self-efficacy affects their emotional or mental responses (such as learned helplessness) during the learning process. Therefore, the results of this study also echo Bandura's

Social Cognitive Theor (1977, 1986).

5.2.2 Influence of Academic Self-Efficacy on Learning Burnout in Vocational College Students

It is found in this study that there is a negative influence of vocational students' acdemic self-efficacy on learning burnout, that is, lower acdemic self-efficacy indicates higher learning burnout, and vice versa. The reason is that vocational college students with lower acdemic self-efficacy always pay attention to their lack of learning ability (Jia, et al., 2014), showing the lack of confidence and interest in learning, hating exams, difficult to obtain better results, low accomplishment, thus leading to severe learning rejection and further enhancing learning burnout; and vocational college students with high acdemic self-efficacy pay more attention to the positive aspects and can fully deal with the things to be solved, thus obtaining more success, decreasing the degree of learning burnout (Zhou & Jiang, 2010). Therefore, the cultivation of self-efficacy in learning can prevent and reduce learning burnout, and this result is consistent with the previous research (Jia et al., 2014; Zhou & Jiang, 2010; Charkhabi, Abarghuei, & Hayati, 2013; Skaalvik & Skaalvik, 2007, 2010).

According to Bandura's (1977, 1986) Social Cognitive Theory, self-efficacy affects the learning behavior of individuals, and individual's self-efficacy is the motivator of behavior (Bandura, 1995), which shows that in the learning process, vocational college students' acdemic self-efficacy has a direct influence on learning burnout. Therefore, the results of this study also echo the Social Cognitive Theory of Bandura's (1977, 1986).

5.2.3 Influence of Learning Burnout on Learned Helplessness in Vocational College Students

It is found in this study that the learning burnout of vocational college students has a positive influence on learned helplessness, that is, the higher the degree of learning burnout, the higher the degree of learning helplessness, and vice versa. The reason is that vocational college students with learning burnout are often accompanied by an experience of lethargy and difficulty in learning, and a helpless and hopeless psychological state that will eventually evolve into learned helplessness; vocational college students with less learning burnout have more confidence in their learning, are more willing to participate in more learning activities, will experience accomplishment in the learning process, and ultimately avoid learned helplessness. Therefore, avoiding learning burnout as much as possible in the learning process can prevent and reduce learned helplessness, which is consistent with previous research results (Li, 2008; Kumcagiz et al., 2014; Pompili et al., 2010). In addition, according to the Theory of Learned Helplessness by Abramson et al. (1978), when vocational college students experience a series of learning failures, they will attribute it to the lack of confidence such as lack of personal abilities, which will produce a sense of helplessness towards learning. In other words, the behaviors of learning burnout in the vocational college students will have a direct influence on the learned helplessness.

5.3 The Mediating Role of Learning Burnout in the Effect of Academic Self-Efficacy on Learned Helplessness in Vocational College Students

It is found in statistical analysis that learning burnout has a mediating role between the vocational students' acdemic self-efficacy and learned helplessness.

From this, it can be seen that the vocational students' acdemic self-efficacy can directly affect the learned helplessness, and can also indirectly affect learned helplessness through learning burnout. Li et al. (2017) believe that social support, as an external factor in an individual's living environment, often interacts with their personal cognitive factors (such as self-efficacy), and plays a regulating role in the development of individual physical and mental health. It is shown in this study that vocational college students have poor basic knowledge in the learning process, have poor ability to analyze and solve problems, review and self-study (self-efficacy), and it is easy to feel helplessness and burnout in learning (learning burnout), and thus they would perveice learned helplessness. On the contrary, the higher the self-efficacy of vocational college students, the more confident they are in their learning abilities and adopting effective methods to solve them, thereby improving their learning achievement. In addition, they are more willing to participate in learning activities and enhance their learning motivation. This reduces the level of learning burnout, generates a benign learning cycle, accumulates more positive emotions, and obtains stable emotional support. When repeatedly foreseeing learning difficulties, even if the students experience multiple failures, they still believe in their ability, drop giving up, dare to explore and solve, and thus form a positive mental state that they will be eventually succeed.

In addition, according to the Social Cognitive Theory of Bandura's (1977, 1986), the individual's different expectations on behavior or results are partially determined by the level of learning efficacy; by changing the level of self motivation, the psychology of actual performer gets changed. It is found in this study that the belief nature (self-efficacy) of vocational college students will have an influence on

the emotional or mental responses (such as learned helplessness) by the individual's learning behaviors (such as learning burnout) generated in the completion of tasks. Therefore, the results of this study also echo Bandura's Social Cognitive Theory (1977, 1986).

5.4 The Mediating Role of Social Support in the Effect of Academic Self-Efficacy on Learned Helplessness in Vocational College Students

It is found in statistical analysis that social support has a moderating effect on acdemic self-efficacy and learned helplessness of vocational college students, and that students with high levels of social support are more effective in suppressing learned helplessness than students with lower levels of social support. As the level of acdemic self-efficacy increases, students with high levels of social support are more effective in suppressing learned helplessness than students with low levels of social support. The reason is: higher vocational students with a high level of acdemic self-efficacy have a more optimistic evaluation on their learning ability and are more confident in learning. When his family, teacher or classmates give him much attention and support, his learning enthusiasm will increase and make them more willing to participate in learning activities and experience more success; even if they fail, with self-confidence and support from others, they are still willing to persist and solve learning difficulties, thereby avoiding a psychological state of learning helplessness. In addition, according to the Reciprocal Theory (1977, 1986) of Social Cognitive Theory by Bandura, psychological function is a continuous interaction between the three factors of individual's environment, person, and behavior, also a process that environment interacts with individual's cognition to influence psychological behavior.

As a result, under the interaction of self-efficacy (cognition or trait of vocational college students) and support from surrounding people (environment of vocational college students), the self-confidence of vocational college students is constantly enhanced, thereby establishing positive psychological state which ultimately affects the learned helplessness of vocational college students. In other words, social support, as an external environment factor, regulates the effect of self-efficacy on learned helplessness. Therefore, the results of this study echo Bandura's Social Cognitive Theory (1977, 1986).

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

Based on the fourth and fifth chapters, this chapter will expound the conclusion and recommendations of this research, which are divided into three sections. The first section is the theoretical and practical significance brought by the findings of this research; section two is the limitations in this study; the third section is the recommendations for parents, school-related education units, and future research. It is expected to provide reference for future teaching and mental health counseling in higher vocational colleges, and provide feasible directions for future related research.

6.1 Theoretical and Practical Significance

From the aspect of educational literature, most researchers only focus on the influence of teacher support on learned helplessness (Pi & Yan, 2010), the effect of occupational burnout on learned helplessness (Kumcagiz, Ersanli, & Alakus, 2014), the relationship between social support and learned helplessness (Peng, 2010; Diener & Dweck, 1980), or the discussion on the mediating effect of learning burnout (Ding & Zou, 2015; Li, Zhao, Xu, & Li, 2009) or the moderating effect of social support (Li, Gao, Yang, & Liu, 2017; Quan & Wang, 2008; Russell et al., 2016; Thomas & Ganster, 1995). Few studies involve analyzing the relationship between vocational college students' acdemic self-efficacy, learning burnout, social support, and learned helplessness. Based on the current learning status of vocational college students (Jiang,

2018; Wang & Zhang, 2013), and in order to alleviate the current situation of learned helplessness, Bandura's (1977, 1986) Social Learning Theory (Reciprocal Determinism) is adopted in this study as the theoretical basis, setting acdemic self-efficacy as the independent variable, social support as the moderating variable, and learning burnout as the mediating variable to build a research framework to explore the relationship between them in learning, and the research hypotheses have been verified. This research makes up for the shortcomings of existing research, enriches Social Cognitive Theory, and provides reference for future research.

In addition, research results show that the acdemic self-efficacy of Chinese vocational college students not only affects learned helplessness through the mediating effect of learning burnout, but also affects learned helplessness under the moderating effect of social support. These two findings provide new ideas and perspectives for future research and provide references for further research. It helps college managers, teachers, and vocational college students to understand the importance of social support and developing self-efficacy, which is of practical and theoretical significance.

6.2 Research Limitations

Although some expected results has been obtained in this study, there are still some shortcomings due to the limitations of the researcher's ability. The limitations of this study will be summarized from the research objects, research methods, and research contents below.

6.2.1 Limitation of Research Samples

In terms of sampling, due to the limitations of time and ability of the

researcher, the samples of this study are only for students in five higher vocational colleges in Henan Province, China. It didn't take into account the vocational students from other provinces. Thus, there are limitations on the explanation and inferences of the research results.

6.2.2 Limitation of Variables

There are many factors affecting the learned helplessness of vocational college students (Gu, 2014; Qian & Wang, 2015; Sullivan et al., 2012), but in this study the factors are limited to acdemic self-efficacy, learning burnout and social support. In the studies of Niu, Peng, Zhao, and Liu (2015), it is also found that the learning motivation of some students with learned helplessness can be revived through external motivation. Therefore, teachers' expectations also play a role of avoiding or reducing helplessness in learning; in addition, Gu (2014) also finds that vocational college students are in the growing stage of adolescents, and the parent-child relationship of the individual' has a major influence on the psychological state such as learned helplessness. Liu (2014), by analyzing the learned helplessness in the class, finds that the students' learning interest is one of the factors that directly affect the students' helplessness. Therefore, in future research, the above factors (parent-child relationship, teacher expectations, learning pressure, learning interest and other factors) can be included in the study variables.

6.2.3 Limitation of Methods

In this study, a self-reported questionnaire survey is used to collect data on vocational students' background variables, acdemic self-efficacy, learning burnout, social support, and learned helplessness. Whether the testers can truly express and reflect the facts may have a bias on the research results. In addition, quantitative

research methods only use data results as hypothetical inferences, and lack detailed theoretical inferences in qualitative research methods. If incorporate qualitative research methods (such as interviews with vocational students, teachers, and classmates) can be involved in, the research results will be more objective and deeper in interpretation and inference.

6.3 Recommendations

6.3.1 Recommendations for Family

According to this study, enhancing the acdemic self-efficacy of vocational college students can effectively prevent students from learned helplessness in the process of learning; in addition, it can also reduce the learned helplessness by reducing students' learning burnout. Therefore, some suggestions are provided for parents as a reference on the education of vocational college students:

It is found in this study that vocational college students' acdemic self-efficacy can predict learning burnout and learned helplessness, that is, cultivating a high level of self-efficacy in learning can effectively prevent and avoid learning burnout and learned helplessness. Parents should strengthen communication with their children in daily lives, pay attention to their daily learning at school, and let children feel more concern and improve parents' care for children. When vocational college students encounter learning difficulties, parents should give more encouragement and praise to strengthen self-confidence. At the same time, parents should strengthen the close connection with students' counselor and pay attentions to students' performance in colleges. This will help the students more effectively regulate their behaviors and moods, improve their ability to adapt to environmental changes, and prevent learning

burnout and learned helplessness.

6.3.2 Recomentations for Related Educational Units

According to the limitations and the discussion on the research results, some recommentations on the education for vocational college students are provided to the relevant educational units and teachers:

It is found in this study that the vocational students' acdemic self-efficacy can predict learning burnout and learned helplessness, that is, cultivating a high level of self-efficacy in learning can effectively prevent and avoid learning burnout and learned helplessness.

Gardner (1983) believes that human intelligence is diverse, and each person has a different intelligence advantage. As a teacher or counselor, in the daily teaching and communication with students, they should thoroughly understand the characteristics and potentials of students, explore their learning advantages, construct a stage for their strengths, and enhance the opportunity and students' confidence in success; the active cooperative learning mode can also be uses to combine different intelligent advantages to affect each other, so that everyone's ability and learning effect are jointly improved, thereby improving learning confidence. In addition, in normal teaching, students can be guided through their own efforts to take effective methods to complete certain difficult learning tasks and make them have a successful experience, thereby cultivating vocational college students' confidence in abilities, which will help to avoid learned helplessness cause by learning burnout in vocational college students.

Colleges should organize teachers to participate in more intellectual learning activities related to the cultivation of students' self-efficacy or interest in

learning, which will help teachers adopt more effective methods to provide timely guidance, thereby cultivating the acdemic self-efficacy in vocational college students. In addition, colleges should emphasize the contact and communication between counselors and parents, assist parents to understand their children's learning status and identify their learned helplessness, and provide parents with correct learning guidance methods. Finally, learning counselling agencies can be set up in colleges to help vocational college students trust their learning abilities and get rid of learning burnout and helplessness.

6.3.3 Recommendation for Further Research

According to the discussion and limitations of this research results, here are suggestions for the future researches from the aspects of research objects, research content and research methods:

1. Expanding Research Objects and Scope

The research objects in this study are vocational college students in Henan Province, China. Hong, Huang and Qiu (2014) believe that students have different personalities due to regional differences, which will affect their target beliefs. Therefore, future research can expand the research scope to vocational college students in other provinces of China, such as Hubei, Jiangxi, Shandong etc., and enlarge the research sample size to collect more comprehensive data. In addition, a comprehensive investigation on students from more types of vocational colleges before and after internship will be more significant.

2. Including Other Research Variables Related to Leaerned Helplessness

It is suggested that future researchers can further investigate more factors, such as personality traits of vocational college students, relationships with parents and

other important members, teacher expectations, learning pressure, and learning interests (Jiang & Peng, 2008). Niu, Peng, Zhao, and Liu (2015) find that the learning motivation of some students with learned helplessness can be revived through external incentives, so teachers' expectations can also prevent or reduce students' helplessness; in addition, Gu (2014) also finds that vocational college students are in their teenage years, and the parent-child relationship also plays a significant role in vocational college students' psychological state such as learned helplessness. Liu (2014), by analyzing the "learned helplessness" psychology in class, finds that students' learning interest is one of the factors directly affecting helplessness. Therefore, in the future research, the above factors (parent-child relationship, teacher expectations, learning pressure, learning interest, etc.) can be included in the variables of the research in order to make a more comprehensive evaluation.

3. Mixing Other Research Methods

Creswell and Clark (2017) advocate that researchers use a combination of qualitative and quantitative methods to clarify subtle differences and interactive confirmation. Chen (2000) believes that the quantitative study can only measure some superficial and quantifiable parts of things, cannot get specific content, and the time point of measurement is single; it can only confirm the previous theory but can't understand the perspectives and views of the parties; the results can only explain the average situation, not taking into account the special circumstances; variable control is difficult, and it is also difficult to study the naturalness of the scenario. The advantage of qualitative research is that it can describe and analyze psychological phenomena at a micro level, and understand the way and views of the problem from the perspective the the parties concern. It need focuse on studying life events in

natural situations and understands the dynamic development of events; induction is used to build theories, and innovations should be conducted in theories. These advantages can make up for the shortcomings of quantitative research. At the same time, some shortcomings of qualitative research methods, such as that it cannot study large samples, that the results cannot be generalized, and that there is no unified procedure for research, are just compensated by the advantages of quantitative research, such as that these are exactly the advantages of quantitative research. Therefore, in the social science, if the two are very well combined, social and psychological phenomena can be studied systematically and comprehensively. Furthermore, these two methods also reflect the unification of scientific and humanistic methods. It is suggested that future research methods of both quality and quantity (such as interviews with vocational college students, teachers, and classmates) will make the research results more objective and deeper in interpretation and inference. Combining multiple methods such as interview method, case study method, and longitudinal survey method, it is possible to examine the situation of learned helplessness of vocational college students and its influencing factors in a detailed and systematic way. Through a thorough and in-depth quantitative and qualitative investigation, the deficiencies of cross-sectional survey and quantitative statistical methods are supplemented in the research.

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APPENDICES

Apendix I: Pre-test Questionnaires

Survey Questionnaire for Students in Higher Vocational Colleges

Dear Classmates,

Thank you very much for participating in this survey. This is a survey on the learning situation of students in higher vocational colleges. Your participation will provide a scientific basis for improving the learning status of vocational college students. Please fill in according to your real situation and thoughts. This questionnaire is not required to be named. The information you provide is only for academic research and overall analysis. Your personal data will not be shown in the research results. To ensure the validity of the survey, please choose the option that suits your situation. Thanks for your cooperation!

Dhurakij Pundit University
Advisor: Dr. Tu Chia-Ching
From PhD student: Shao-Wei Wu
E-mail: 410250122@qq.com

Personal Information: The following are some basic information about you. Please tick the option that matches your situation.

1. Gender: □ Male □ Female

2. Grade: □ Freshmen □ Sophomore □ Junior

3. Student Origin: □ Rural □ Urban

4. Discipline: □ Arts □ Sciences

5. Single-child: □ Yes □ No

Part I: Acdemic Self-Efficacy Questionnaires

		Complete Inconformity	Weak Inconformity	Uncertain	Weak Conformity	Complete Conformity
	Students have different self-efficacy in completing learning tasks. Please carefully read the following sentences and choose the option that is consistent with your actual situation in studies: ① Complete Inconformity; ② Weak Inconformity; ③ Uncertain; ④ Weak Conformity; ⑤ Complete Conformity.					
Acdemic Self-Efficacy	1. In learning, if I do my best, I can always solve the problem.	①	②	③	④	⑤
	2. In learning, even if others disagree with me, I still have a way to persuade each other.	①	②	③	④	⑤
	3. For me, sticking to ideals and learning goals is easy.	①	②	③	④	⑤
	4. I am confident that I can effectively deal with any learning difficulties I have never seen.	①	②	③	④	⑤
	5. With my ingenuity, I will be able to cope with unexpected learning problems.	①	②	③	④	⑤
	6. If I make the necessary effort, I can definitely solve most of the learning problems.	①	②	③	④	⑤
	7. I can calmly face learning difficulties because I trust my ability to deal with them.	①	②	③	④	⑤
	8. When facing a learning problem, I usually find several solutions.	①	②	③	④	⑤
	9. When I have trouble in study, I can usually think of some countermeasures.	①	②	③	④	⑤
	10. In learning, no matter what difficulties I encountered, I believe I can find a solution.	①	②	③	④	⑤

Part II: Learning Burnout Questionnaires

Please answer the following questions according to your situation, and tick the appropriate options according to your level of compliance: ① "rare" = "several times or less a year"; ② "occasionally" = "almost once a month"; ③ "often" = "several times a month"; ④ "frequent" = "once a week" ⑤ "very frequently" = "every class".		Rare	Occasionally	Often	Frequent	Very Frequently
Emotional Burnout	1. I feel depressed because of my studies.	①	②	③	④	⑤
	2. After studying all day, I feel exhausted.	①	②	③	④	⑤
	3. Early in the morning, I have no enthusiasm when thinking of a day of study.	①	②	③	④	⑤
	4. As long as I'm in class, I feel stressed and uncomfortable.	①	②	③	④	⑤
	5. I feel that learning is exhausting my energy.	①	②	③	④	⑤
Negative Attitude	1. Since I entered college, I have become less and less interested in studying.	①	②	③	④	⑤
	2. I feel that learning is boring.	①	②	③	④	⑤
	3. I doubt the knowledge I learned is useful.	①	②	③	④	⑤
	4. I doubt whether learning makes sense to me.	①	②	③	④	⑤
Low Self-Efficacy	1. It is difficult for me to effectively deal with any problems that arise in my studies.	①	②	③	④	⑤
	2. In learning, I doubt whether the learning effort I am doing is effective.	①	②	③	④	⑤
	3. I did poorly in my studies.	①	②	③	④	⑤
	4. It is difficult for me to reach the established learning goals effectively.	①	②	③	④	⑤
	5. I didn't learn anything interesting in my course.	①	②	③	④	⑤
	6. In class, it is difficult for me to complete each learning task efficiently.	①	②	③	④	⑤

Part III: Social Support Scale

The following items are social support you perceive from different aspects, please choose the option that is consistent with your actual situation in studies: ① Complete Inconformity; ② Weak Inconformity; ③ Uncertain; ④ Weak Conformity; ⑤ Complete Conformity.		Complete Inconformity	Weak Inconformity	Uncertain	Weak Conformity	Complete Conformity
Family Support	1. My family will help me wholeheartedly in my studies.	①	②	③	④	⑤
	2. When I face a learning dilemma, my family gives me spiritual encouragement.	①	②	③	④	⑤
	3. I will talk to my family about my studies or life.	①	②	③	④	⑤
	4. When a decision needs to be made, my family will provide advice.	①	②	③	④	⑤
Teacher Support	1. My teacher can really help me in my studies.	①	②	③	④	⑤
	2. When I have a learning problem or dilemma, I can ask my teacher for help.	①	②	③	④	⑤
	3. I can share my happiness and sadness with my teachers.	①	②	③	④	⑤
	4. I can talk to my teachers about my studies or life.	①	②	③	④	⑤
Student Support	1. My classmates can really help me in my studies.	①	②	③	④	⑤
	2. I can ask my classmates for help when I have learning problems or difficulties.	①	②	③	④	⑤
	3. I can share my happiness and sadness with my classmates.	①	②	③	④	⑤
	4. I can talk to my classmates about my studies or life.	①	②	③	④	⑤

Part IV: Learned Helplessness Scale

		Complete Inconformity	Weak Inconformity	Uncertain	Weak Conformity	Complete Conformity
	Many students will encounter some setbacks and failures in their study and growth. The following sentences describe some situations related to this. Please answer the following questions based on your actual situation when facing these setbacks and learning difficulties. Please tick the appropriate option according to the conforming degree: ① Complete Inconformity; ② Weak Inconformity; ③ Uncertain; ④ Weak Conformity; ⑤ Complete Conformity.					
Cognitive Helplessness	1. 1. I feel that in my studies, even if I work hard, I won't get high marks.	①	②	③	④	⑤
	2. For me, I don't find it interesting.	①	②	③	④	⑤
	3. As far as learning is concerned, I always find it difficult to succeed.	①	②	③	④	⑤
	4. I feel it is impossible for me to improve my academic performance.	①	②	③	④	⑤
	5. I feel that the exam has no meaning to me.	①	②	③	④	⑤
Emotional Helplessness	1. I am afraid to ask my teachers and classmates when I have difficulty learning.	①	②	③	④	⑤
	2. No matter what class I take, I am afraid to answer questions and ask questions actively.	①	②	③	④	⑤
	3. I always find the questions on each exam difficult.	①	②	③	④	⑤
	4. I have never experienced a sense of accomplishment in my studies.	①	②	③	④	⑤
	5. I feel very depressed as soon as I have class.	①	②	③	④	⑤
	6. My grades are so bad that I feel very depressed.	①	②	③	④	⑤
	7. The homework assigned by the teacher is always difficult, I can’t handle it.	①	②	③	④	⑤
Behavioral Helplessness	1. I have reviewed carefully before the exam, but my grades are still poor.	①	②	③	④	⑤
	2. I study well just because of the pressure of further studies.	①	②	③	④	⑤
	3. I am often overwhelmed by the problems I encounter in my studies.	①	②	③	④	⑤
	4. I don’t know how to learn each course well.	①	②	③	④	⑤
	5. Learning is too boring, I can’t help it anymore.	①	②	③	④	⑤
Attribution Helplessness	1. My grades are poor because I am not very smart and my mind is slow.	①	②	③	④	⑤
	2. I often take low scores because of my poor learning ability.	①	②	③	④	⑤
	3. I don’t want to study because it is too boring.	①	②	③	④	⑤

Dear students! This's the end of the questionnaire. Please check the questionnaire again for any omissions. Thank you very much for your contribution to the research!

Appendix II: Formal Questionnaires

Survey Questionnaire for Students in Higher Vocational Colleges

Dear Classmates,

Thank you very much for participating in this survey. This is a survey on the learning situation of students in higher vocational colleges. Your participation will provide a scientific basis for improving the learning status of vocational college students. Please fill in according to your real situation and thoughts. This questionnaire is not required to be named. The information you provide is only for academic research and overall analysis. Your personal data will not be shown in the research results. To ensure the validity of the survey, please choose the option that suits your situation. Thanks for your cooperation!

Dhurakij Pundit University
Advisor: Dr. Tu Chia-Ching
From PhD student: Shao-Wei Wu
E-mail: 410250122@qq.com

Personal Information: The following are some basic information about you. Please tick the option that matches your situation.

1. Gender: □ Male □ Female

2. Grade: □ Freshmen □ Sophomore □ Junior

3. Student Origin: □ Rural □ Urban

4. Discipline: □ Arts □ Sciences

5. Single-child: □ Yes □ No

Part I: Acdemic Self-Efficacy Questionnaire

		Complete Inconformity	Weak Inconformity	Uncertain	Weak Conformity	Complete Conformity
	Students have different self-efficacy in completing learning tasks. Please carefully read the following sentences and choose the option that is consistent with your actual situation in studies: ① Complete Inconformity; ② Weak Inconformity; ③ Uncertain; ④ Weak Conformity; ⑤ Complete Conformity.					
Acdemic Self-Efficacy	1. In learning, if I do my best, I can always solve the problem.	①	②	③	④	⑤
	2. In learning, even if others disagree with me, I still have a way to persuade each other.	①	②	③	④	⑤
	3. For me, sticking to ideals and learning goals is easy.	①	②	③	④	⑤
	4. I am confident that I can effectively deal with any learning difficulties I have never seen.	①	②	③	④	⑤
	5. With my ingenuity, I will be able to cope with unexpected learning problems.	①	②	③	④	⑤
	6. If I make the necessary effort, I can definitely solve most of the learning problems.	①	②	③	④	⑤
	7. I can calmly face learning difficulties because I trust my ability to deal with them.	①	②	③	④	⑤
	8. When facing a learning problem, I usually find several solutions.	①	②	③	④	⑤
	9. When I have trouble in study, I can usually think of some countermeasures.	①	②	③	④	⑤
	10. In learning, no matter what difficulties I encountered, I believe I can find a solution.	①	②	③	④	⑤

Part II: Learning Burnout Questionnaire

	Please answer the following questions according to your situation, and tick the appropriate options according to your level of compliance: ① "rare" = "several times or less a year"; ② "occasionally" = "almost once a month"; ③ "often" = "several times a month"; ④ "frequent" = "once a week" ⑤ "very frequently" = "every class".	Rare	Occasionally	Often	Frequent	Very Frequently
Emotional Burnout	1. I feel depressed because of my studies.	①	②	③	④	⑤
	2. After studying all day, I feel exhausted.	①	②	③	④	⑤
	3. Early in the morning, I have no enthusiasm when thinking of a day of study.	①	②	③	④	⑤
	4. As long as I'm in class, I feel stressed and uncomfortable.	①	②	③	④	⑤
	5. I feel that learning is exhausting my energy.	①	②	③	④	⑤
Negative Attitude	1. Since I entered college, I have become less and less interested in studying.	①	②	③	④	⑤
	2. I feel that learning is boring.	①	②	③	④	⑤
	3. I doubt the knowledge I learned is useful.	①	②	③	④	⑤
	5. I doubt whether learning makes sense to me.	①	②	③	④	⑤
Low Self-Efficacy	1. It is difficult for me to effectively deal with any problems that arise in my studies.	①	②	③	④	⑤
	2. I did poorly in my studies.	①	②	③	④	⑤
	3. It is difficult for me to reach the established learning goals effectively.	①	②	③	④	⑤
	4. I didn't learn anything interesting in my course.	①	②	③	④	⑤
	5. In class, it is difficult for me to complete each learning task efficiently.	①	②	③	④	⑤

Part III: Social Support Scale

The following items are social support you perceive from different aspects, please choose the option that is consistent with your actual situation in studies: ① Complete Inconformity; ② Weak Inconformity; ③ Uncertain; ④ Weak Conformity; ⑤ Complete Conformity.		Complete Inconformity	Weak Inconformity	Uncertain	Weak Conformity	Complete Conformity
Family Support	1. My family will help me wholeheartedly in my studies.	①	②	③	④	⑤
	2. When I face a learning dilemma, my family gives me spiritual encouragement.	①	②	③	④	⑤
	3. I will talk to my family about my studies or life.	①	②	③	④	⑤
	4. When a decision needs to be made, my family will provide advice.	①	②	③	④	⑤
Teacher Support	1. My teacher can really help me in my studies.	①	②	③	④	⑤
	2. When I have a learning problem or dilemma, I can ask my teacher for help.	①	②	③	④	⑤
	3. I can share my happiness and sadness with my teachers.	①	②	③	④	⑤
	4. I can talk to my teachers about my studies or life.	①	②	③	④	⑤
Student Support	1. My classmates can really help me in my studies.	①	②	③	④	⑤
	2. I can ask my classmates for help when I have learning problems or difficulties.	①	②	③	④	⑤
	3. I can share my happiness and sadness with my classmates.	①	②	③	④	⑤
	4. I can talk to my classmates about my studies or life.	①	②	③	④	⑤

Part IV: Learned Helplessness Scale

		Complete Inconformity	Weak Inconformity	Uncertain	Weak Conformity	Complete Conformity
	Many students will encounter some setbacks and failures in their study and growth. The following sentences describe some situations related to this. Please answer the following questions based on your actual situation when facing these setbacks and learning difficulties. Please tick the appropriate option according to the conforming degree: ① Complete Inconformity; ② Weak Inconformity; ③ Uncertain; ④ Weak Conformity; ⑤ Complete Conformity.					
Cognitive Helplessness	1. I feel that in my studies, even if I work hard, I won't get high marks.	①	②	③	④	⑤
	2. For me, I don't find it interesting.	①	②	③	④	⑤
	3. As far as learning is concerned, I always find it difficult to succeed.	①	②	③	④	⑤
	4. I feel it is impossible for me to improve my academic performance.	①	②	③	④	⑤
	5. I feel that the exam has no meaning to me.	①	②	③	④	⑤
Emotional Helplessness	1. I am afraid to ask my teachers and classmates when I have difficulty learning.	①	②	③	④	⑤
	2. No matter what class I take, I am afraid to answer questions and ask questions actively.	①	②	③	④	⑤
	3. I always find the questions on each exam difficult.	①	②	③	④	⑤
	4. I have never experienced a sense of accomplishment in my studies.	①	②	③	④	⑤
	5. I feel very depressed as soon as I have class.	①	②	③	④	⑤
	6. My grades are so bad that I feel very depressed.	①	②	③	④	⑤
	7. The homework assigned by the teacher is always difficult, I can’t handle it.	①	②	③	④	⑤
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	2. I study well just because of the pressure of further studies.	①	②	③	④	⑤
	3. I am often overwhelmed by the problems I encounter in my studies.	①	②	③	④	⑤
	4. I don’t know how to learn each course well.	①	②	③	④	⑤
	5. Learning is too boring, I can’t help it anymore.	①	②	③	④	⑤
Attribution Helplessness	1. My grades are poor because I am not very smart and my mind is slow.	①	②	③	④	⑤
	2. I often take low scores because of my poor learning ability.	①	②	③	④	⑤
	3. I don’t want to study because it is too boring.	①	②	③	④	⑤

Dear students! This's the end of the questionnaire. Please check the questionnaire again for any omissions. Thank you very much for your contribution to the research!