RESEARCH ON RELATIONSHIP BETWEEN ACHIEVEMENT GOALS, SELF-EFFICACY, LEARNING STRATEGY AND ACADEMIC PERFORMANCE OF STUDENTS FROM PRIVATE UNIVERSITIES IN SHANDONG PROVINCE

By

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ABSTRACT

Since the end of the 20th century, China's higher education has been popularized, and its scale has been continuously expanded. Therefore, China's private higher education develops dramatically. It plays an important role and makes an important contribution to the popularization of Chinese higher education. To gain a thorough understanding of the learning situation and influencing factors of students in private universities, this study finds that achievement goals, self-efficacy and learning strategies are important motivation and cognitive factors, which affects students' academic performance through the review and sorting of theoretical literature. Therefore, taking students from private universities in Shandong Province as research objects, this study explores the influence and role of students' achievement goals, self-efficacy and learning strategies on their academic performance.

Based on questionnaire survey, supplemented by focus on group interviews, participants selected from private universities in Shandong Province and the researcher sent out 1000 questionnaires, 951 of which were collected and 873 ones were valid. Based on the results of SPSS data analysis, it is found that the achievement goals of students in private universities in Shandong Province have a direct and significant relationship with their academic performance, and the achievement goals can influence students' academic performance through the intermediary of students' self-efficacy and learning strategies. That is to say, students' self-efficacy and learning strategies have mediating effectiveness between the achievement goals and academic performance. The research results can be used as a reference for understanding students' learning motivation and cognition in private universities in Shandong Province.

Keywords: Private university, Achievement goal, Self-efficacy, Learning strategy, Academic performance

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CHAPTER 1

INTRODUCTION

Taking students from private universities in Shandong Province as participants, this study aims to explore the influence of students' achievement goals, self-efficacy and learning strategies on their academic performance and then to understand the mediating roles of students' self-efficacy and learning strategies on the relationship between achievement goals and academic performance. In this chapter, the research background and motivations are presented to analyze the variants of this study and clarify the purpose of this study.

1.1 Research background

1.1.1 Students' learning should be emphasized with the rapid development of Chinese private universities

Since the end of 20th century, China's higher education has been popularized, and its scale has been continuously expanded and its gross enrollment ratio has been increasing year after year. With the emergence of the contradiction between educational needs and insufficient state-owned educational resources, China's private higher education has started again in the 1980s, which has become the most important and profound system reform in the field of education (Wu, 2018). After nealy 40 years of exploration and development, it has been trasformed from an useful complement of

China's public universities to an important part in the cause of China's higher education (Non-state Education Promotion Law of the People's Republic of China, 2002), which has played a great role in the popularization of China's higher education.

First, the development of China's private higher education can be observed in its continuous expansion of scale. In terms of the number of private institutions of higher education (including private universities), from 1982 to 2005, private institutions of higher education (including academic and non-academic institutions) grew from more than 30 to 1329, an increase of 44.3 times. In terms of private universities, the number of them increased from 6 in 1991 to 275 in 2006, with a total growth of 45.8 times and an average annual growth of 17. During this period, they grew fastest in 1999, with the number increasing from 25 to 275, an increase of 11 times in seven years (Lu & Wu, 2007). Since 2007, their number has been stabalized but it is still showed an uptrend. According to the Statistical Bulletin on the Development of National Education released by the Ministry of Education of China, by the end of July, 2017, the number of China's private universities is 747 (including 265 Independent Colleges and 1 adult college), with 5 more than that of 2016. They accounted for 28.4% of the total number of general colleges and universities in China. (see Figure 1.1 for details of the number and the proportion of private universities in the past 10 years).

Second, overall, the number of students in private universities is increasing year after year. At present, the students' number has increased from more than 60,000 in 2000 to more than 6,000,000 in 2017. According to the Statistical Bulletin on the Development of National Education released by the Ministry of Education of China in

2017, by the end of 2017, the number of students enrolled in private universities is 6,284,600, having 125,000 more than that of 2016. They accounted for 22.8% of the total number of general college students enrolled in China. There are also 800 other private institutions of higher education, with 744,700 registered students of all kinds. (see Figure 1.2 for details of the number and the proportion of the students in private universities in the past 10 years).

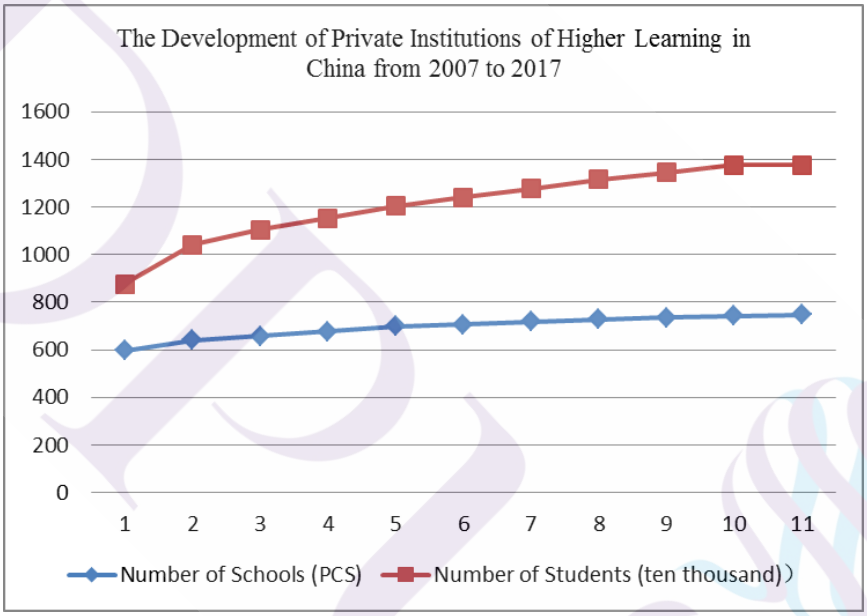

Figure 1.1 The development of private universities and students in China

Sources: The Statistical Bulletin on the Development of National Education of the Ministry of Education of China in 2017

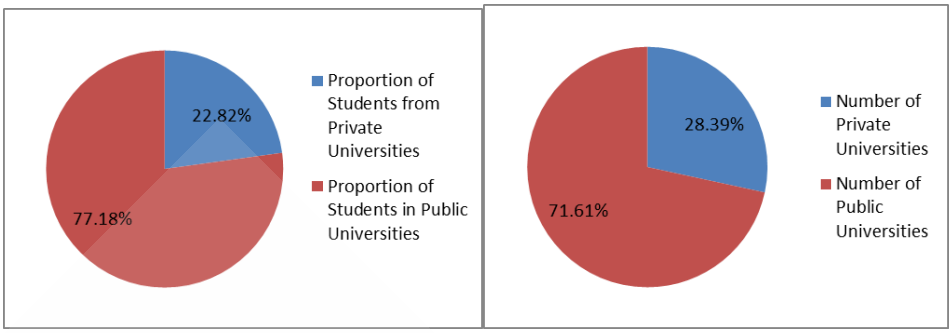

Figure 1.2 The development of private universities and students in China

Sources: The Statistical Bulletin on the Development of National Education of the Ministry of Education of China in 2017

The Chinese government also attaches great importance to the development of private higher education and its status and role, and constantly promulgates relevant laws, regulations and policies to encourage and support its development, which also lays a solid foundation for the future development of private higher education in China.

However, under extremely difficult conditions, private universities in China could only be maintained by using the forces of various sectors of society, including borrowing or absorbing the existing resources of public universities. They were short of enough funds and were relatively weak in discipline strength and the ability of sustainable development. In the earlier days of running private universities, students were not admitted in the same way as public college students. They could only obtain the officially recognized diploma by siting for the examination for self-study programs and the examination for certain diplomas, which had negative impact upon the status of private universities in the mind of the public (Zhang, 2002). Commonly, Chinese

private university students tend to be less-motivated for study, lack of learning strategies, and poor in self-management after entering the university (Wu, 2014). Therefore, Wu (2007) hold that adopting the pattern that "sustaining private universities by tuition fees" brings a tag for Chinese private universities, which indicates the distinct Chinese characteristics. It becomes more necessary for China's private universities to stick to the true essence of education and go beyond the utility of it. Focusing on the fundamental purpose of "educating people", while ensuring students learn knowledge and develop their skills, they should pay more attention to and train the students' learning ability to promote students to obtain continuous learning and developing space and highlight their own competitive advantages in the development of differentiation (Liu, 2015).

1.1.2 There are few studies taking students from Chinese private universities as participants and studying their learning situation from the perspective of motivation and cognitive factors

Learning refers to the change of people's psychological tendency and ability, which will last for a period of time, and cannot be simply attributed to the growth process (Gagn'e, 1985). Such internal change cannot be observed. So it must be inferred through the external behavior and from the change in work or performance (Shao, 1995). Generally speaking, learners need to evaluate their learning results and effects after a period of study. At present, students' academic performance is still one of the important indicators to measure learning effectiveness, and it can reflect students' learning ability and learning effect in a relatively objective way. Especially as we enter 21st century, global education gradually focus on six subjects including lifelong learning, self-efficacy,

collective efficacy, long-lasting and stable motives, achievements and feedback and metacognition (CERI/OECE, 2015). Zimmerman (2007) believed that learning behaviors not only depended on the personal knowledge and skills but also depended on whether individuals have the will to employ their knowledge, including employing cognitive and metacognitive strategies. But if one lacks the motive of applying knowledge and strategies to new context, he could not achieve effective learning. In the social cognitive model of self-regulated learning theory, motivational regulation and cognitive regulation are mechanisms that are of equal importance in learning process and are indispensable important factors (Zimmerman, 1994; Boekaerts, 1995, 1996). Among them, achievement goal is one of the most important frameworks to explain students' learning motives, personal learning and experience (Diseth, 2015). Self-efficacy and learning strategies are also factors that have great influence on students' academic performance. Many research findings reveal that academic self-efficacy and students' learning strategies have prediction effects on their academic achievements and have direct influence on their final learning results and grades (Pintrich & DeGroot, 1990; Antonio, Komarraju, & Nadler, 2013; Feldman, 2015; Stajkovic, Bandura, Locke, Lee, & Sergent, 2018).

Then, as a group of college students with certain cognitive ability but also particularities, what is the status of achievement goals, self-efficacy and learning strategies of China's private university students? How can these three factors be combined to make an integrated analysis of their effects on academic performance? Therefore, this study aims to conduct an in-depth empirical study on the relationship

between the four, exploring the motivation and behavioral characteristics behind the learning of students' in private universities, revealing their specific influence mechanisms and internal rules, and providing reference for the targeted management and teaching of private universities and teachers.

1.2 Research motivations

Based on the above research background, taking students from private universities in Shandong Province as participants and academic performance as a basic index, this study tends to explore the influences of motivational and cognitive factors such as students' achievement goals, self-efficacy and learning strategies on their academic performance. The specific motivations are as follows:

1.2.1 The existing researches have inconsistent conclusions on whether the achievement goals have notable impacts on students' academic performance.

In students' learning, most of the early researches focus on the role of students in their own cognitive process, especially emphasize the influence of metacognition on students' study (Pintrich, 2003). Many researchers in motivational field have been constantly highlighting the important role of motivation in learning process and emphasizing the regulating action of factors such as learners' motivation, belief and emotion to their cognition and action (Pintrich, 1993; Eccles, 2002). Therefore, with psychologists starting to explain achievement motivation from the purpose of pursuing success, that is, to explain how individuals are motivated and how learning activities are affected from the perspective of motivation concept (Pintrich, 2000), achievement goals are concerned by researchers as a particular factor of motivation. Some studies have

found that achievement goal is the goal or reason adopted by students when they finish their learning tasks, which can be used to explain students' academic achievements (Ames, 1992; Pintrich & Schunk, 1996). It is also more specific variable of motivation and is the closest and most direct influential variable to learning behavior (Li, 2003). The goal orientation of learners' learning will affect their cognition, feelings and behaviors. Learners have different academic performance mainly because they insist on different goal orientation when they are in achievement situations (Chen, 2010). So it is necessary to deeply understand students' learning motivation and goals and their effects on learning results from the perspective of achievement goals.

At present, Achevement Goal Theory is gradually divided into mastery goal and performance goal from being a single factor. Then it is further divided into three dimensions: mastery goal, performance-approach goal and performance-avoidance goal. And then four dimensions: mastery-approach goal, mastery-avoidance goal, performance-approach goal and performance-avoidance goal. Such theoretical development constantly approaches some deep phenomena such as students' learning motivation and goals, so it can make a more scientific explanation of students' learning behaviors. However, there are varied views on the influence of students' achievement goals on their academic performance. Some studies believe that achievement goals affect students' academic performance not only in a direct way but also in an indirect way through regulating cognition and meta-cognition (Zimmerman, 2000; Malpass, 1999; Zhang, 2019); and some studies hold that achievement goals do not directly affect academic achievements or results. For example, achievement goals play an indirect role

in academic performance through cognition and meta-cognition, and learning strategy may be a mediating factor between achievement goal orientation and academic performance (Lei, Wang, 2001; Wang, Ling, Zhu, 2003). Senko and Harackiewicz (2008) argue that achievement goals have indirect effect on academic achievements through cognitive and behavioral process. And they even treated their relationship from the perspective of cause and effect. Some studies have found that every dimension has different influences on learners' learning effects. For example, mastery-goal orientation is positively correlated with academic performance, while performance-goal orientation is negatively or not notably correlated with it (Meece & Holt, 1993; Schraw & Hor, 1995; Li, Yang, 2018). Elliot and Mc Gregor (1999) divided goal orientation into three dimensions: mastery-goal orientation, performance approach and performance avoidance. The relationship between mastery goal and academic performance is uncertain; performance-approach goals will lead to great academic performance, while performance-avoidance goals will cause poor academic performance. According to the research by Ranellucci and Hall (2015), lower achievement gains can be predicted from performance-avoidance goals and affect students' academic performance by employing learning strategies.

Although achievement goals have gone through the development from a single factor to multiple factors, any factor is not absolutely independent from others. Every goal orientation can coexist in a same person. There are only differences in the level but not in having or not goal orientations between different individuals. For instances, there is no contradiction between working hard to master tasks and trying to go beyond others,

and it is possible to possess multiple goals on different levels. Therefore, this study tends to focus on achievement goal as a whole, and to explore the situation of its four dimensions' influence on students' academic performance with a view to mastering students' psychological and learning development direction in a more deep way.

1.2.2 The available researches have inconsistent conclusions on whether students' self-efficacy and learning strategy play a mediating role in the impact of achievement goals on their academic performance.

1.2.2.1 There are many factors that can affect students' academic performance and learning effect, among which self-efficacy is one of the influential factors. Bandura and Schunk (1977, 1983) hold that self-efficacy has a direct influence on students' final learning results and academic performance and students' academic achievements could be accurately predicted from the level of self-efficacy. Someone with high levels of self-efficacy will gain higher academic achievements, while those with low levels of self-efficacy will gain lower academic achievements. Pintrich, Schunk, Zimmerman, Miller and Greene (2002, 2000) argued that self-efficacy affect students' academic achievements through cognitive and meta-cognitive strategies. Zhang (2006) believed that middle school students' achievement goals indirectly affect their academic achievement through self-efficacy. According to the research by Zheng (2011), the self-efficacy of high school students plays a mediating role in the impact of achievement goal orientation on their academic performance. By making a regression analysis and testing the model reflecting the mediating effect of self-efficacy, Zhu (2012) has found that the self-efficacy of college students completely play a mediating role between

mastery-goal orientation and academic performance. Taking 428 students as participants, the study of Høigaard, Kovač, Øverby and Haugen (2014) have found that high levels of perception of task goal structure and civic virtue can predict high levels of academic achievements through high self-efficacy. But there are also studies arguing that self-efficacy will affect students' choice of achievement goals, which will lead to different goals (mastery goal, performance-approach goal and performance-avoidance goal) and then affect students' academic performance (Middleton & Midgley, 1997; Elliot & Mcgregor, 2001; Komarraju & Nadler, 2013).

In summary, the available researches have distinct conclusions on the path of the effect of achievement goals and self-efficacy on students' academic performance. Therefore, this study will further explore the path of the effect and its degree of self-efficacy and achievement goals on students' academic performance.

1.2.2.2 College students' learning is different from that of primary and secondary students. Apart from specialized learning, both of their ways of learning and testing show the trend of diversity. To play a leading and guiding role in sociocultural and scientific development, college students need to learn to learn. And learning strategy is the core of learning to learn and an important factor affecting learning efficiency and quality. Gettinger and Seibert (2002) pointed out that student's learning strategy is the most fundamental factor affecting learning ability. Effective learning strategies have positive influences on different students and their learning contents. Bandalos, Finney and Geske (2003) believed that students can improve their academic performance by being taught how to master learning strategies, and meta-coginitive strategy can

significantly improve students' academic performance (Alexander, Graham , & Harris, 1998). Zhou et al. (2014) held that learning strategy and academic performance were interacted and notably correlated with each other. students with high levels of using learning strategies were more likely to obtain excellent academic achievements which would further develop their levels of using learning strategies. Those who had poor academic performance lacked the ability to employ learning strategies, and they benefited less from making full use of learning strategies to improve their performance. Taking Norwegian undergraduate psychology students as participants, Diseth (2011) measured their High school grade point average (HSGPA), self-efficacy, goal orientations, learning strategies, and examination grade and found that all the motivational variables (self-efficacy and goal orientations) had strong correlation with the deep and surface learning strategies. Consequently, there is no doubt about the effect of learning strategy on students' academic performance. However, this paper will explore what role it will play when it is combined with achievement goals and self-efficacy.

1.2.3 Taking students at private universities as participants, this paper tends to explore the relationship between academic performance and achievement goals, self-efficacy and learning strategies and its situation, to enrich the present researches.

In the recent ten years, with their quantities and enrolled students steadily increasing, Chinese private universities have developed rapidly. The situation of students' learning needs to be concerned. However, because of the peculiarity of their development, survival and development are still the fundamental problems of China's private universities (Cao, 2013). However, due to the deep-rooted thought that public universities

are superior to private ones, few students who get excellent grade in the College Entrance Examination will choose private universities. Mainly owing to have failed to get access to public ones, many students enter private universities with a “second-best” mentality (Zhang, 2002). In the meanwhile, affected by the admission policy of the China’s College Entrance Examination, private universities can only carry out their recruitment and admission after the admission of the government-required universities with early admission policies (Art college, Military academy, etc.) and key undergraduate universities. Hence, during the process of admission, students who get high grades have less or no chances to be admitted to private universities. This situation still exists today. Moreover, there are something unsatisfying in the quality of students’ education. For instances, some researchers compared the learning needs of 458 students from 6 private and public universities through questionnaire and found that there were significant distinctions between students from private and public universities in terms of taking learning as the first need, learning motivation and the choice of reading lists (Liao, 2005). There was also someone who compared them from the perspective of graduate employment, finding that in reality, the actual employment rate and job-hunting success rate of students in private universities were lower than those of students in public universities (Wu, 2005). In view of this, it is more urgent and vital for private universities in Shandong Province to fully understand the situation of their students’ motivations and cognition such as achievement goals, self-efficacy and learning strategies, investigate their distinctions, better grasp students’ learning characteristics and concern the growth and development of students.

To sum up, it is a complicated process for students' achievement goals, self-efficacy and learning strategies to affect academic performance. In available researches, there are also different conclusions on the effect and degree of related factors. And the studies integrating these several aspects are few. Hence, taking students from private universities in Shandong Province as participants, this study tends to explore the impact of achievement motivation, self-efficacy and learning strategies on their academic performance. On the one hand, it helps us to deeply grasp students' learning situation. On the other hand, we hope that this study can further enrich the available researches by applying to different participants.

1.3 Research objectives

According to the existing researches, different scholars have an inevitable divergence of their research results because of the differences of their understanding of the concept of achievement goals, self-efficacy and learning strategies and their methods of classification. Thus, taking students at private universities in Shandong Province as objects, this study explores the effects of these students' achievement goals, self-efficacy and learning strategies on their academic performance by means of literature review and questionnaire. The research objectives of this study can be concluded as follows:

1.3.1 To explore the differences in achievement goals, self-efficacy, learning strategies and academic performance among students at private universities in Shandong Province.

1.3.2 To explore the effects of the achievement goals, self-efficacy and learning strategies of students at private universities in Shandong Province on their academic performance.

1.3.3 To explore the mediating effects of the self-efficacy and learning strategies of students at Shandong private universities on achievement goals and their academic performance.

1.4 Research questions

Based on the above research motivations and objectives, the main issues discussed in this study are as follows:

1.4.1 Is there any difference in achievement goals, self-efficacy, learning strategies and academic performance among students at private universities in Shandong Province?

1.4.2 Do the achievement goals, self-efficacy and learning strategies of students at private universities in Shandong Province have effects on their academic performance?

1.4.3 Do the self-efficacy and learning strategies of students at Shandong private universities have mediating effects when achievement goals affect their academic performance?

1.5 Defining important terms

To make the definitions of the variables in this study more explicit, the concept of the terms involved in this study such as China's private universities, achievement goals, self-efficacy, learning strategies and academic performance will be defined as follows:

1.5.1 China's private university

In Mainland China, private universities are generally called "Min Ban" universities. According to "law of the People's Republic of China on Promotion of Privately-run Education" (revised 2016), private and non-private universities are divided based on the subject of running a school. The definition of private universities is as follows: First, the sponsors are not national institutions; Second, the funding comes from non-state financial funds; Third, the universities are organized facing society. Those who fit the three standards above are private universities. The private universities in this paper refer to non-governmental schools, which have two levels of education: junior college education and undergraduate education and fit the above-mentioned three standards.

1.5.2 Self-efficacy

Bandura (1994) defines self-efficacy as personal beliefs, judgments or feelings of "how well he can complete this activity" before he executes certain course of action. This study holds that self-efficacy is an individual's self-cognition and an individual's judgment on the feelings of performing certain behaviour, which represents the degree of confidence and affects an individual's level of effort, persistence and choice of activities. And in this study, self-efficacy refers to students' judgments on their abilities to successfully complete their academic tasks in learning area. It represents students' choice of academic tasks, their efforts and persistence, which refers to academic self-efficacy.

1.5.3 Achievement goal

Elliot and Dweck (2005) believe that the core of achievement goals is competence, which reflects the goal or ideal state that individuals want to achieve in a

specific environment and task. Having this concept as its principal basis, the achievement goal in this study specifically refers that learners motivate the motivational factors based on certain goal orientation, which can have certain effects on their behaviors. It inherently includes learners' individual cognitive judgement and value judgement. There are four types of achievement goals: Mastery-approach goals (have courage to take risks, constantly pursue improvement), mastery-avoidance goals (avoid making mistakes, avoid learning deeper knowledge), performance-approach goals (outperform others, prove self-ability), and performance-avoidance goals (maintain public images, avoid being accused of incompetence).

1.5.4 Learning strategy

In this study, learning strategies refer to a set of integrated learning methods and techniques adopted by college students to improve their learning efficiency and effects in their learning process throughout the university stage and different strategies chosen in specific learning environment and learning process (Zhou, 2014). There are three main dimensions: meta-cognitive strategies, cognitive strategies and resource management strategies. Meta-cognitive strategies mainly refer to individuals' efforts to set learning goals through planning, monitoring and regulation and to enable themselves to achieve planned goals. Cognitive strategies refer to some methods and techniques of processing information which can enable information to be extracted effectively from the memory, mainly including rehearsal strategy, elaboration strategy and organizational strategy, and so on. Resource management strategies refer to a kind of learning strategy that can assist students with their management of available learning resources in learning

activities, specifically including time management strategy, environmental management strategy and help-seeking strategy, and so on.

1.5.5 Academic performance

In colleges and universities, students' academic performance still accounts for a large proportion in students' comprehensive evaluation. It is a reflection of students' academic achievements and one of the diagnostic indicators of learning effects (Li & Ma, 2010). At university, in the professional curriculum system, the importance and difficulty of each course vary, and the overall learning situation of students in each course also varies. Consequently, in this study, students' academic performance will take the subjects' grades of all the compulsory course as units. After the conversion of standard scores and T scores, the weighted average of course credits and hours will be calculated. Then it will be analyzed.

CHAPTER 2

LITERATURE REVIEW

Based on the research purpose, this research will mainly deal with the relationship between achievement goals, self-efficacy, learning strategy and academic performance of students at private universities in Shandong Province. This chapter is a literature review and is divided into five sections. Section one deals with the implication, theories and relevant research of achievement goals; section two deals with the implication, theories and relevant research of self-efficacy; section three deals with the implication, theories and relevant research of learning strategy; section four provides relevant explanations of academic performance; section five is about the interrelationship among achievement goals, self-efficacy and learning strategy.

2.1 Achievement goals

Achievement goals investigate achievement motivations from the perspective of social cognition, represent the reasons why individuals participate in achievement activities for getting valuable returns, and they are the most energetic and influential research direction of achievement motivations (Elliot, 1999). It has already been discovered that there is a close relationship between goals and motivations: individuals set things that they consider valuable as their goals, which inspires behavior motivations of working hard, and goals are the direct causes of behavior motivations (Elliot, 1999;

Harackiewicz, Barron & Elliot, 1998). According to Pintrich (2003), the goal of a specific type determines the behavior pattern of that type. Therefore, the goal orientation specifies why individuals participate in leaning activities, the importance of which is to predict the academic performance of individuals (Wigfield et al., 2015), and it determines learning directions. On the basis of present research, this section mainly summarizes the connotation, development and relevant research of Achievement Goal Theory.

In the field of psychology, achievement motivation has attracted attention since 1930s, suggesting that human beings have internal motivations of pursuing achievements. Until 1960s, psychologists believed that the outcome of human pursuing achievements could be interpreted from the perspective of degrees (amount) of motivations; that is, achievement motivations of ordinary people could be categorized into either high level or low level, and those who had high motivations and strove to succeed would set higher goals and spare no pains to perform better (Middleton & Midgley, 1997). However, with the application of achievement motivations, it was difficult to make a breakthrough explanation for some individuals' behaviors under specific achievement circumstances. For instance, there were two students under motivations of the same intensity, one of whom studying for high grades and the other studying for resolving practical issues, and researchers could not explain their difference from the perspective of the level of achievement motivations. Therefore, psychologists started to explain such phenomena from the goal of pursuing success in 1970s, and thus achievement goals were introduced into achievement motivations (Elliot & Harackiewicz, 1996). In other words, achievement goals develop along with the deeper research of

Achievement Goal Theory and the intensified attention that psychologists have paid to the influences of individuals' cognitive factors on achievement behaviors. Achievement goals are the leading topic of achievement motivation research and the extension of goal setting research (Dweck, 1986); achievement goals explain how individuals are inspired and how influence is exerted on learning activities from the perspective of the concept of motivations (Middleton & Midgley, 1997; Pintrich, 2000). Literally, the goal is the cognitive pattern that individuals try to attain and that subjects have to accomplish, and it provides a direction in behaviors for individuals (Elliot, 1999; Harackiewicz, Barron, & Elliot, 1998). Achievement Goal Theory developed on the basis of the collaborative work of Dweck (1986), Nicholls (1984) and Ames (1992). It includes and supports many opinions about academic motivations that Attribution and Social Cognitive Theory has put forward with, and it breaks new ground in research on the field of academic motivations.

2.1.1 The implication of achievement goals

Achievement goals is a new research topic in the field of achievement motivations. There is no consensus on the definition of achievement goals among previous scholars by far. Dweck and Leggett (1988), the earliest proposers of Achievement Goal Theory, believed that as the plan that individuals make about cognitive process, achievement goals have the characteristics of cognition and emotion and lead to the outcome of behaviors. They also specified learning goals and performance goals: for learning goals, individuals believe that capabilities can be improved and that skills can be acquired; for performance goals, individuals believe that efforts and study

cannot change capabilities and that the purpose of efforts and study is only to demonstrate their capabilities. According to Ames (1992), Urdan and Maehr (1995), achievement goals are the approach students perceive learning activities, academic achievement purpose, work and significance of success, and also the integration pattern of attribution of success and failure, capability beliefs and emotions. Elliot (1996) combined achievement goals and competency together,and she believed that achievement goal orientation is individuals' cognition about behaviors related to competency, the way individuals view success, failure, capabilities, efforts and so on, and it also represents individuals' beliefs in achievements and achievement behaviors. Pintrich (2000) believed that achievement goals are individuals' cognition about pursuing academic task achievement goals and they represent individuals' orientation towards achievement tasks, including beliefs in purpose, task success criteria, capabilities, effort-judgment and so on, which are an well-organized belief system. Elliot and Dweck (2005) also believed that the fact that competency is the core issue of achievement goals represents that individuals hope to attain objects and reach the ideal state in specific environments and achievement tasks. Maehr and Kaplan (2007) believed that achievement goals are cognitive schema, which not only includes goal itself but also includes relevant processes, such as attribution of success and failure and emotional reactions, and that goals are accompanied with either positive or negative emotional experience, attitude and behaviors.

Different definitions and connotations of achievement goals represent scholars' different personal opinions about achievement goals. Although scholars state definitions in various ways, most of them still share common points: achievement goals, with social

cognitive characteristics of motivations, are motivation factors inspired by learners based on certain goal direction and have an influence on behaviors; achievement goals contain cognitive judgment and value judgment of individuals. The difference among achievement behavior purposes of individuals is related to the individual emotions, the motivations, the cognition and behavior outcomes.

2.1.2 Relevant research on achievement goals

2.1.2.1 Theoretical framework and development of achievement goals

With the constantly deepening Achievement Goal Theory and empirical study, researchers have been continuously analyzing, clarifying and updating the structure of Achievement Goal Theory. Researchers discussed it as a single concept at first; they developed “mastery goals” and “performance goals” (Dweck, 1986), and then on the basis of Motivation Theory, researchers put forward the two dimensions of “approaching success” and “avoiding failure”; by crossing “mastery” and “performance”, they developed four types of achievement goals (Elliot & McGregor, 2001), namely “mastery-approach”, “mastery-avoidance”, “performance-approach” and “performance -avoidance”, which advanced the improvement and development of Achievement Goal Theory.

(1) Development of performance goals and mastery goals

Achievement goals refer to an integration belief of different degrees of engagement or approaching which is developed when individuals are faced with achievement situations, and they reflect the criteria by which individuals judge their own success and failure and then influence individuals’ attribution of success and failure

(Ames, 1992). Compared with Cognitive Learning Theory which emphasizes "how" students learn and "what" they should learn, Achievement Goal Theory pays more attention to "why" students learn (Dweck, 1986). Therefore, based on individuals' motivations, Achievement Goal Theory under learning circumstances mainly deals with the functions of goal orientations

In early time, Achievement Goals emphasized the functions of capabilities in achievement situations. Nicholls (1984) believes that achievement goals demonstrate personal capabilities; for one thing, individuals compete with themselves, and because their capabilities come from their previous experience and knowledge, individuals have high capabilities to exceed the old ones; for another, individuals perceive their own capabilities by competing with other people, so only when they exceed others in performance will they have high capabilities. Dweck (1986) sorted the goal orientations that people present while doing tasks into mastery-goal orientation and performance-goal orientation, and also summarized the characteristics of these two types of goal orientations from the perspectives of cognition, emotions and behaviors: individuals of mastery-goal orientation are driven by internal motivations and they value the comprehension and mastery of learning materials and the development of their capabilities, which often brings about positive outcomes; individuals of performance-goal orientation are driven by external motivations and they value their external performance and others' appraisals, which often brings about negative outcomes. Therefore, in the aspect of cognition, individuals of mastery-goal orientation value their capability improvement and the learning process, and they believe the improvement of capabilities

is directly proportional to efforts. Individuals of mastery-goal orientation study for the mastery of knowledge and the improvement of capabilities, so they are inclined to attribute their failure to their incompetency and are inclined to work harder to adjust their strategies. They always keep a positive mental state; they feel happy when they make efforts and they feel satisfied when they get successful results. However, individuals of performance-goal orientation are different from individuals of mastery-goal orientation. Individuals of performance-goal orientation pay more attention to how they can demonstrate their higher capabilities and get higher grades. They prefer success with less efforts, and when they fail they will feel anxious. In the aspect of behaviors, individuals of mastery-goal orientation will choose those tasks which can help to enrich their knowledge and develop their capabilities, and during the process of undertaking the task, these individuals demonstrate high persistence and devotion. However, individuals of performance-goal orientation prefer to avoid challenges and they are inclined to choose simple tasks because these tasks may bring success to them more easily. Harackiewicz, Barron, Pintrich, Elliot and Thrash (2002) call this mastery-performance dichotomy "Normative Goal Theory".

From the development, it can be seen that Achievement Goal Theory turns motivations from a traditional demand driving force into the intermediary of social cognition. In other words, achievement motivations are influenced by different situations and create different mental activities and cognitive judgments, which lead to different behaviors and performance.

(2) Development of “approach” and “avoidance”

In the systematic Achievement Motivation Theory, early researchers regarded “approaching success” and “avoiding failure” as the decisive factors of individuals’ behavior orientation (Atkinson, 1957), and most of them discussed “approach-avoidance” in the field of achievement motivations. At the early stage of research on achievement goals, it was generally believed that mastery-goal orientation was related to positive outcomes and performance-goal orientation was related to negative outcomes. However, as Achievement Goal Theory develops, practical conclusions show inconsistency: individuals of performance-goal orientation also make efforts to accomplish tasks from time to time, and they indeed employ learning strategies positively to get good grades. In order to better explain this phenomenon, Dweck & Elliot (1983) included “approach-avoidance” of achievement motivations into the theoretical framework of Achievement Goals. They combined “approach-avoidance” and “mastery-performance” together, sorted goals into “performance-approach goals” and “performance-avoidance goals”, and also incorporated the undifferentiated mastery goal. A ternary framework came into being. Individuals of performance-approach goals desire to get good grades and other people’s appraisals and prefer positive judgments of their capabilities. Sometimes they act like individuals of mastery-goal orientation; but if they did not get satisfactory results, both their motivations and their persistence would abate. Therefore, they still demonstrate difference from individuals of mastery-goal orientation. Individuals of performance-avoidance goals care about how to avoid negative outcomes and others’ negative judgments of themselves. They prefer those easy and less challenging tasks to

escape negative judgments. However, individuals of mastery goals care about how to master and comprehend knowledge and how to improve their capabilities. Researchers find out that the three objective constructs can exist independently (Elliot & Church, 1997; Middleton & Midgley, 1997).

Elliot and Mcgregor (2001) brought forward 2×2 Achievement Goal Framework (Table 2.1), namely mastery-approach goals, mastery-avoidance goals, performance-approach goals and performance-avoidance goals. Individuals of mastery-approach goals try to use knowledge to improve themselves; they pay attention to the mastery, learning and comprehension of tasks, and they evaluate their performance by criteria of their progress, improvement and comprehension of tasks. Individuals of mastery-avoidance goals prevent the failure of task owing to incomprehension of tasks; their evaluation criterion is whether they accomplish tasks on the basis of self-comparison. Individuals of performance-approach goals desire to get good grades and exceed other people, and they evaluate themselves by normative criteria, such as whether getting the first place in an examination. Individuals of performance-avoidance goals avoid getting low grades thus showing their incompetency, such as not being the last place.

Table 2.1 The 2×2 achievement goal framework

	Mastery	Performance
Approaching Success	Mastery-Approach	Performance-Approach
Avoiding Failure	Mastery-Avoidance	Performance-Avoidance

Data source： A2×2Achievement goal framework (Elliot & McGregor, 2001)

The practicability of the framework can be proved by factor analysis. Furthermore, mastery-avoidance goals are mainly related to negative outcomes and negative emotion experience. For instance, individuals of mastery-avoidance goals are more likely to feel anxious and less likely to employ learning strategies and adaptive methods in learning (Elliot & McGregor, 2001). In academic settings, with university students as subjects, Elliot and Murayama (2008) found that Achievement goals of quartation has higher model fitting degree than that of trichotomy and mastery-avoidance goals are related to negative emotions and unstructured learning. Finney, Pieper and Barron (2004) also used university students as subjects and modified the scale with which they measured professional achievement goals. By confirmatory and exploratory factor analysis, they found that quartation could be applied to measure achievement goals in domains. Bong (2009) used primary and secondary school students as subjects and found that four types of goals have the optimal model fitting degree.

In short, approach-avoidance is individuals' motivation nature, while mastery-performance is the result of social cognitive comparison and the cognitive outcome of individuals' interactions in society. The staggered collocation of these two dimensions further explains the connotation of Achievement Goals and provides a more direct comprehension of individuals from goals, emotions to behaviors.

As research goes further, the influences of society and family on individuals' achievement goals are brought into study. Researchers also put forward new dimensions such as society-goal orientation and instrument-goal orientation, which makes research on achievement goals more specific and detailed. Furthermore, researchers begin to pay attention to the collaborative impacts of multiple goals on individuals' behaviors. On the basis of present work, Elliot, Murayama and Pekrun (2011) brought forward 3×2 Achievement Goal Framework, which includes task-approach, task-avoidance, self-approach, self-avoidance, others-approach and others-avoidance. The framework of achievement goals fits realistic learning situations better, which helps to make research more consistent to reality and more objective. Ning (2016) took 384 freshmen from a university in Hong Kong as participants; multivariate regression analysis shows that 3×2 Achievement Goal Framework has different prediction functions about students' academic performance, learning depth, superficial learning strategies and instrument-seeking.

2.1.2.2 Relevant research on the relationship between achievement goals and achievement motivations

From the connotation and development of Achievement Motivation Theory, it can be noted that achievement goal is a leading topic in research on achievement motivations. During the process of achievement goals functioning in achievements, motivation variable is one of the key factors. The relationship between achievement goals and achievement motivations is an important issue in research on Achievement Goal Theory. Ames (1990) has found that mastery goal is positive to internal motivations and

performance goal is negative to internal motivations. Some researchers believed that both mastery goal and performance goal are valid prediction factors of internal motivations under motivation circumstances (Harackiewicz, 2000). Dweck (1992) believed that there is an affiliation between mastery goal and internal motivations, and mastery goal itself is part of generalized internal motivations. According to Ghaleb et al. (2015), there is a collaborative impact of mastery goal and meta-cognition on learning motivations. Martin & Elliot (2016) believed that personal optimal goals represent higher motivations and higher engagement one year later; apart from personal optimal goals, mastery goal represents higher motivations and higher engagement, too; furthermore, the functions of performance goals are either neutral or negative. All of these findings support the following argument: as time goes on, personal optimal goals are related with higher motivations and higher engagement.

2.1.2.3 Relevant research on the relationship between achievement goals and emotions

As it is continuously improved and detailed, Achievement Goal Theory is applied widely. There is research which pays attention to the relationship between achievement goals and emotions. Won et al. (2018) found that university students' sense of school belonging is related to mastery goals, their sense of peer group belonging is related to performance goals, and mastery goal regulates the relationship between the sense of learning cognition and study time management strategies. Goetz et al. (2016) used 120 students as participants and did an intra-individual relationship analysis about students' state goals and emotions. Their research showed that mastery goal is a positive

prediction factor about happiness and a negative prediction factor about boredom and anger; performance goal is a positive prediction factor about pride; performance-avoidance goal is a negative prediction factor about anxiety and shame. Hall et al. (2016) believed mastery goal and performance goal control the indirect impacts on result-related emotions (hope, anxiety) through perception. Mastrotheodoros et al. (2017) believed that goal orientation is an important aspect of individuals' difference. They sampled and analyzed 576 senior high school students; they found that students whose primary motivation is learning-approach goal had the greatest opportunities for development,, because they demonstrate higher academic achievements and positive mental health.

2.1.2.4 Relevant research on achievement goals and physical exercise

With Achievement Goal Theory, Joan and Duda (2003) investigated goal orientations of students in physical education and their research showed that sports students' motivations are related to achievement goals. Cetinkalp & Turksoy (2011) found that mastery goal has a positive function to predict the skill development of male football players. With qualitative research, Ciani, Sheldon and Hilpert (2011) discovered that football players have employed mastery-avoidance goals of two levels. Achievement Goal Theory shows that in the field of research on athletic achievement goals, mastery goal is a positive prediction factor about internal motivations (Li & Zhou, 2015). While conducting the research on the relationship between achievement goals and happiness of junior hockey players, Jaakkola, Ntoumanis and Liukkonen (2016) found that the motivation climate of mastery-approach task in achievement goals is a significant factor

for junior hockey players to get happiness. Schneider, Harrington & Tobar (2017) believed that a university hockey player of task-orientation will enjoy playing hockey better than a player of self-orientation.

2.1.3 Measurement of achievement goals

Achievement goals have developed from the original unidimensional framework to the present multidimensional framework which includes social context factors. Accordingly, its measurements also vary. In the aspect of dichotomy, Nicholls (1984) sorted achievement goals into work-approach goals and self-approach goals. On this basis, Ames et al. (1992) developed an achievement goal orientation scale. In their studies, achievement goals are divided into two independent dimensions, namely learning goals and performance goals; there are seven questions for each dimension, and it adopts the 5-point system; the high score of one dimension represents that the testee is more of that dimension of achievement goal orientation. Button (1996) developed a general goal orientation questionnaire, in which he established two dimensions of learning-goal orientation and performance-goal orientation and there are altogether eight questions to test these two dimensions.

Since the achievement goals of trichotomy came into being, researchers have been developing corresponding scales. Elliot and Church (1997) establish an achievement goals questionnaire, which includes three dimensions, namely performance-approach goal, performance-avoidance goal and mastery goal, and there are six questions for each dimension. Midgley (1998) developed an achievement goals orientation scale, which includes three dimensions of task-goal orientation, capability-approach-goal orientation

and capability-avoidance-goal orientation. As for researchers in mainland China, on the basis of translation and revision of the instruments employed by foreign scholars, they developed more localized measure instrument by integrating China's background. Liu and Guo (2002) established achievement goals orientation scale, in which there are four subscales: mastery-approach goals (nine questions), mastery-avoidance goals (six questions), performance-approach goals (nine questions) and performance-avoidance goals (five questions).

Elliot and McGregor (2001) developed a scale of quartation and then revised it in 2008. The scale contains four dimensions: mastery-approach, mastery-avoidance, performance-approach and performance-avoidance. There are twelve items in the scale, 3 items in each dimension, and the scale is graded on the 7-point system. The alpha coefficient of performance-approach-goal orientation is 0.92, the alphacoefficient of performance-avoidance-goal orientation is 0.94, the alphacoefficient of mastery-approach-goal orientation is 0.84, and the alphacoefficient of mastery-avoidance-goal orientation is 0.88; the predicting ability of the scale is good. With the consent of the original author, scholars in mainland China Xiao, Bai, Wang and Cui (2013), translated the scale into Chinese and also did analysis and tests of its reliability and validity. The scale employs the 7-grade system, ranging from 1 (*strongly agree*) to 7 (*strongly disagree*), with the total score between 12 and 84 points. This questionnaire selects one university in Beijing and one university in Hunan Province with the alpha coefficients of each subscale between 0.675 and 0.876. Because this research is

going to discuss the four aspects of 2×2 achievement goal framework, it will take this scale as the research instrument of achievement goals.

2.1.4 Relevance of achievement goals and academic performance

In the past thirty years, there has been a lot of research on students' achievement goals in school environments, which represent one's efforts to focus on how well a task or an activity can be done (Mascreta, Elliot & Cury, 2017). Students' academic performance is always considered to be an indicator of predicting educational performance. Researchers believe that achievement goals have influence on academic performance, but there will be different influence degrees or outcomes due to different functions of each dimension. Button (1996) used university students as subjects, and found that there is a positive correlation between mastery-goal orientation and GPA (grade point average), but there is no notable positive correlation between performance-goal orientation and GPA. On the basis of four-dimensional achievement goal framework, Elliot & McGregor (2001) discovered that performance-approach goal is a positive prediction factor about students' academic performance, performance-avoidance goal is a negative prediction factor of students' academic performance, and neither mastery-approach goal nor mastery-avoidance goal can predict academic performance. The research results are in line with the conclusions of Elliot, McGregor and Gable (1999): the fact that students of mastery-approach goals learn in the way of deep-processing may have no direct correction with academic performance; by contrast, students of performance-approach goals are more likely to perform well in examinations. Bong (2009) has found that there is a positive correlation between primary

and secondary students' mastery-approach goals and their mathematics grades. Wang and Liu (2000), and Jiang and Liu (2006) also found that both mastery goals and performance-approach goals correlate positively with academic performance, but performance-avoidance goals correlate negatively with academic performance. However, there is research pointing out that students of performance-approach goals are likely to pay more attention to the process of comparing themselves with others; or that the more efforts they make, the lower capabilities they have, so they ignore the importance of efforts; therefore, performance-approach goals correlate negatively or have no correlation with academic performance (Nasiriyan et al., 2011). Lei and Wang (2001) found that mastery-goal orientation, performance-orientation and avoidance-orientation do not correlate notably with academic performance. Li and Xu (2007) supported this viewpoint, and they believed that achievement goals do not have a direct impact on academic performance but can exert an indirect and marked impact through learning strategies which are intervening variables. Zhou (2010) verified that mastery goals and performance-approach goals not only have a direct impact on university students' academic achievements, but also have an indirect impact on it through students' independent study. Maurice et al. (2015) have found that goal orientation may matter in the academic performance of students majoring in pharmacy; students of mastery orientation get the highest average score; however, the worry is that junior and senior students of performance-avoidance orientation get the highest average score. Ng'ang'a, Mwaura and Dinga (2018) have found that achievement goal orientation correlates notably with academic performance and the former has a positive prediction ability.

Apart from the discovery that mastery-capability orientation can predict academic performance positively, researchers also found that mastery-avoidance and performance-avoidance correlate positively with academic performance, different from the negative correlation that most of researchers put forward. Neroni et al. (2018) believed that in traditional education environments, goal orientation is important to predict the academic performance of child students, adolescent students and university students; they also conducted research in the adult distance education, and found that for academic performance, performance-approach is a positive prediction factor, performance-avoidance is a negative prediction factor, and mastery-approach and mastery-avoidance do not have notable predicting ability.

In conclusion, achievement goals explain how individuals are driven from the nature of the concept of motivations; achievement goals are the combination of motivations and cognition and have impacts on students' academic achievements. Currently, Achievement Goal Theory is continuously being enriched, improved and developed, its constituents are being concretized and clarified, and it will play different parts in individual learning. But any one factor is not absolutely independent, each goal orientation can exist in the same person at the same time, there is only a difference in level between different individuals, there is no difference with or without.Therefore, this study mainly focuses on the overall achievement goals to explore the impact of students' academic performance.

2.2 Self-efficacy

Self-efficacy is a topic concerned by education, psychology and sociology circle, and since its proposal, it has been widely studied and applied. Zimmerman (1994, 1998, 2001) believed that self-efficacy runs through every link of the learning process, and it has impacts on individuals' effort degree, adherence and activity selection. This section will focus on relevant research on self-efficacy.

2.2.1 The implication of self-efficacy

Self-efficacy is an important part of Bandura's Social Learning Theory and a logical product of the general view of learning (Gao, 2000). Bandura (1977) brought forward the concept of self-efficacy and believed that self-efficacy is the confidence degree of people about whether they could accomplish certain tasks with their skills. In 1986, Bandura defined self-efficacy as "people's judgment of their capabilities to organize and execute the action process which are needed to achieve set behavioral goals" in his *Social Foundations of Thought and Action*. Different from Capability Theory of traditional psychology, self-efficacy of Social Learning Theory does not try to describe a stable property of subjects, but tries to study the functions of subject from the psychodynamic perspective of the development of individual mental and physical skills (Evans, 1989). Therefore, Bandura (1994) defined self-efficacy as the belief, judgement or feelings of capabilities which are needed by individuals to complete an activity at a certain level.

Currently, owing to different study angles in academia, there are different angles of recognizing the concept of self-efficacy. To name just a few, self-efficacy refers

to a state of mind in which an individual responds to a particular situation (Ashton & Webb, 1986); self-efficacy refers to people's sense of competence while facing a certain task (Schultz, 1990); self-efficacy refers to individuals' belief in whether they can accomplish a given task (Schunk, 1991; Schwarzer, 1997). Therefore, self-efficacy is not necessarily relevant to individuals' skills, but relevant to how they view their capabilities to accomplish certain tasks (Mataka & Kowalske, 2015).

In conclusion, researchers have provided various definitions of self-efficacy from its process, its form of expression and its range. However, these definitions are in line with the definition provided by Social Cognition Theory and their core idea is the same: first, self-perception of individuals is the assessment of how many skills they possess; second, self-evaluation of capabilities is individuals' sense of whether they can use their skills to accomplish given tasks or engage in certain behaviors, which represents the degree of self-confidence. That is, self-efficacy is not all about the skills or strategies possessed by individuals but also about the judgment of whether individuals can use their skills to achieve goals.

2.2.2 Relevant research on self-efficacy

2.2.2.1 Structure of self-efficacy

Bandura (1977) believes that self-efficacy is a domain-specific conception, and there will be different types of self-efficacy under different circumstances, and self-efficacy is not a general individuality trait. Self-efficacy of an individual varies a lot when the individual is faced with different tasks; the fact that an individual has high self-efficacy does not mean this individual also has the same level of self-efficacy when

faced another task. Besides, domain-specific self-efficacy can predict more accurately in its corresponding domain; that is, domain-specific self-efficacy can better predict individuals' characteristics and performance in specific domains and specific situations. Therefore, self-efficacy mainly refers to the self-efficacy in a specific task domain. However, some scholars believe that self-efficacy is ubiquitous and that self-efficacy can be seen as either a state or a trait; there is self-efficacy which is not centered around a specific domain and it is an individuality trait and the confidence of individuals faced with different things; it also has prediction abilities about work or behavioral performance (Schwarzer, Mueller & Greenglass, 1999). Furthermore, they established different editions of General Self-Efficacy Scale.

Compared with general self-efficacy, self-efficacy in learning domain can be viewed as academic self-efficacy. Therefore, academic self-efficacy can be employed to explain students' judgment of whether they can accomplish academic tasks, and it represents students' choice of learning tasks, degree of efforts and persistence. Self-efficacy in this research refers to academic self-efficacy, and the corresponding scale is also mainly selected on the basis of it.

2.2.2.2 Generation and influence factors of self-efficacy

As individuals' self-judgment of the effectiveness presented when they interact with environments, self-efficacy has to be based on certain experience or information. From the perspective of Social Learning Theory, the interactions between people and environments and the results of interactions all show individuals a large number of different information. The type of information related to effectiveness of individuals'

interaction is called information of self-efficacy, and it is from this type of information that self-efficacy is recognized and processed (Gao, 2000).

There are many influence factors of self-efficacy, and Bandura (1986) sorted these factors into four categories, namely mastery experience, vicarious experience, social persuasion and physiological and emotional states. Present research has already verified the importance of the four sources (Joët, Usher, & Bressoux, 2011; Usher, 2009). Mastery experience is the most important factor; the more mastery experience is, the higher individuals' self-efficacy will be, and vice versa. As soon as individuals develop relatively stable high self-efficacy, an occasional failure cannot cut down his self-efficacy. For example, an unsatisfactory examination result cannot reduce the self-efficacy of a student whose academic performance keeps excellent.

As for vicarious experience, it is not individuals' personal experience, but a kind of experience provided by other people; individuals get vicarious experience by observing and perceiving others' relevant experience (Bandura, 1986). The similarity with others is the clue of measuring self-efficacy (Schunk, 2012); that is, by observing others' actions and action results, individuals can make a judgment of whether they have capacities to accomplish certain tasks. When students are not sure about their capabilities or when they lack clear judging criteria of their own capabilities, vicarious experience is more likely to exert an influence on academic self-efficacy.

Social persuasion refers to other people's persuasion, comment, suggestion and enticement, and it will also influence individuals' evaluation of their personal capabilities. Bandura (1977, 1986) believed that persuasion also creates chances of success. The

effects of persuasion are influenced by two factors. The first factor is the factor about the persuader, including his capabilities, strengths, reputations, etc.; the more professional the persuader is, the higher his social status is, the more respected and trusted by the persuaded he is, the better the effects of improving the self-efficacy of the persuaded will be. The second factor is the factor about the scientificity, rationality and acceptability of the persuasion. However, it should be noted that the effects of persuasion improving self-efficacy is unstable and weak; without supports of relevant experience, simple persuasion cannot improve self-efficacy greatly and for long. In other words, positive feedback can improve individuals' self-efficacy, but this improvement will not last if they have bad performance later (Schunk, 2012).

The influences of physiological and emotional states on self-efficacy cannot be overlooked. As situations change, individuals' emotions are always aroused; different emotions and their corresponding physiological results will all have a great impact on self-efficacy. Extreme physiological and emotional states will reduce self-efficacy, and intense stress can lead to uncontrollable actions. However, modest stress sometimes can help people to work harder, which can yield better outcomes. Bandura (1977) believed that people who tend to attribute physiological and emotional responses to their inadequate capabilities and who do not believe in their own coping abilities are more likely to have lower self-efficacy; lower self-efficacy may cut down their learning motivations and academic performance; their self-efficacy will be further eroded and there will be a vicious circle. According to Gao (2000), positive emotions can improve

self-efficacy and negative emotions can reduce self-efficacy; furthermore, authoritative persuasion also have regulating functions and it can improve self-efficacy.

On the other hand, individuals' cognitive evaluation, which also has an impact on self-efficacy, is influenced by individuals' assessment of the success or failure of their activities and tasks, individuals' attribution of success and failure, external evaluations and other factors. If an individual attributes the reason of success to high capabilities or great efforts, his academic self-efficacy will be enhanced. If an individual attributes the reason of failure to inadequate capabilities, his academic self-efficacy will be cut down, and he will doubt his personal capabilities and then make less efforts, which will impede the further improvement of his grades; however, if an individual attributes the reason of failure to unstable external factors such as tasks being too difficult or luck being bad, his academic self-efficacy will not be influenced notably. In return, self-efficacy also exerts an influence on attribution patterns; students of different academic performance also show difference in attribution patterns: students who have lower self-efficacy and bad academic performance demonstrate a negative attribution pattern, while students who have higher self-efficacy and good academic performance demonstrate a positive attribution pattern; different attribution patterns have an indirect impact on academic performance through self-efficacy.

2.2.2.3 Self-efficacy function

According to Bandura (1986), the components of self-efficacy are outcome expectations and efficacy expectations. The former refers to individuals' belief that a certain behavior will result in specific consequences. That is to say, gaining certain kinds

of skills will be conducive to specific results. The latter means the belief about estimating whether one has the capability of achieving the goals that he or she pursues. Bandura holds the belief that efficacy expectations determine the efforts that one puts into doing things, which in turn affects the action that he or she takes. To be specific, functions of self-efficacy can be listed as follows: (1) It influences people's behavior, persistence and endeavor. Bandura (1977) believed that an individual's belief of self-efficacy would affect the judgment of his own self-efficacy, having an impact on not only choices of activities and social environment, but also the way of behavior. For individuals, they are inclined to avoid tasks and situations that they think are beyond their abilities. Instead, they are more likely to undertake the ones that they think are meaningful and easy-to-accomplish. The greater the likelihood that individuals will succeed in their work and tasks, the greater efforts and perseverance they will harbor. (2)Self-efficacy judgment determines the individual's attitude when confronting difficulties. Schunk (2012) pointed out that students with higher self-efficacy will pursue more challenging goals and strive for them. Even if they fail, they will attribute the failure not to incompetence but to the lack of efforts. So they are relatively more persistent in the face of difficulties. That is to say, confidence brings self-efficacy. People with confidence believe that difficulties and obstacles could be overcome through hard work when they are confronted with them, motivating them to pay more efforts to meet the challenges. While people with low self-efficacy level will doubt their ability, who will gradually be discouraged, or even completely give up. (3) Self-efficacy affects individual's modes of thinking and emotional response. People with low self-efficacy are apt to exaggerate personal

shortcomings when interacting with others. And they tend to perceive potential difficulties as more serious than they actually are. People with a rich sense of self-efficacy will focus their attention and efforts on the requirements of situation and be even more motivated due to the challenges. Therefore, if a person has a high level of self-efficacy, he or she will engage in an activity delightedly and positively, so that he or she will be more likely to succeed (Fast et al., 2010; Schunk, 2012). On the contrary, people with a low level of self-efficacy have a tendency of overestimating the difficulties they encounter and exaggerating personal shortcomings, thus distracting him or her from effectively employing his or her abilities to achieve goals. One may trap oneself into a dilemma once he or she fails to employ capabilities effectively to achieve goals, leading to lower chances of success naturally.

The influencing factors and functions of self-efficacy are actually detailed interpretations of the concept of self-efficacy, which further verifies the interaction between individual self-efficacy and other factors, especially highlighting the impact of self-efficacy on individuals. By combing through the ideas, it is not difficult to see that self-efficacy is based on the subjective self-judgment of the interaction between oneself and the environment, which further implies the faith or confidence the individual has on his or her own work or study.

In conclusion, self-efficacy is an individual's self-perception, an evaluation of one's competence, representing the degree of self-confidence. The production of self-efficacy is the subjective self-judgment of the interaction between individual and society. It originates from experience of success, vicarious experience, verbal persuasion,

emotional reaction and so on, exerting a vital impact on individual behavior through individual selection, thinking, motivation, physical and mental reaction, etc. Therefore, according to the characteristics of objects of the study, and based on what is mentioned above, this study defines self-efficacy in the field of learning, that is, academic self-efficacy, which is the evaluation of learners' self-confidence in whether they can use their own abilities or skills to complete their learning tasks. It is also a subjective judgment and feeling of individuals to control their learning behavior and learning ability.

2.2.2.4 Previous studies of the relationship between self-efficacy and other behaviors of individuals

For antecedent variables of self-efficacy, relevant researches mainly focus on the aspects of social support, academic emotion and attribution training. Bao and Hu (2009) studied the relationship between self-efficacy and social support, and found that different levels of social support have a significant impact on academic efficacy. Research by Li and Song (2013) indicated that different academic emotions can affect academic self-efficacy and learning adaptability. By the longitudinal structured equation model, Burns, Rebecca and Collie (2018) demonstrated that the improvement of students' adaptability and self-efficacy could be predicted according to the social support from parents, peers and teachers, which in turn leads to the forecast of the improvement of students' academic engagement and academic performance.

What's more, studies on the effect variables of self-efficacy manifested that individual learning, motivation, achievement and self-regulation will be affected by

self-efficacy (Multon, Brown, & Lent, 1991; Schunk & Pajares, 2009; Schunk & Usher, 2012; Williams & Williams, 2010). Concerning the influence of academic efficacy on learning behavior, learning achievement, psychological state, the research by Zimmerman (1990, 1992) and others indicated that academic self-efficacy affects students' goal setting and application of learning strategies in the process of learning. The research of Zhao et al. (2011) on undergraduate nursing students showed that academic self-efficacy is a significant negative predictor of learning burnout. In terms of academic achievement, Chen's research (2013) demonstrated that comparative self-efficacy in academic self-efficacy has a conspicuous predictive effect on academic achievement. Ghorbandordinejad and Afshar (2017) discussed the relationship between self-efficacy and English learning achievement of Iranian English learners. The results showed that there is a strong relevance between self-efficacy and English learning achievement, which means that the higher the foreign language self-efficacy, the higher English scores the respondents could get.

Some studies have found that demographic variables are closely connected to learning self-efficacy. Eccles (2002) has found in his research that gender is another factor which shares clear relationship with self-efficacy. In another word, difference of gender also contributes to varied levels of self-efficacy. For example, male college students' higher self-efficacy mainly presents in science and engineering, while female college students' higher self-efficacy largely lies in literature and history. Wilson, Bates, Scott, Painter and Shaffer (2015) studied the differences of self-efficacy among women, minority students and students majoring in science, technology, engineering and

mathematics(STEM). They discovered that although the self-efficacy level of young women is generally lower than that of men, the gender differences of self-efficacy barely exist in subjects of STEM. Gender differences are only significant in certain subjects (chemistry, computer science and engineering).

2.2.3 Measurement of self-efficacy

In the early stage of the study, academic self-efficacy was often measured by the general self-efficacy scale, which was co-designed by Schwarzer and Jerusalem in 1981. Initially, there were 20 items in the scale and then the number was changed to 10. It was used to measure individual's stable and abstract self-efficacy in the face of various stressful situations. Four-point Likert scale was used, with the internal consistency coefficient being between .75 and .91. And the validity of the scale also reached the relevant standards. However, with the increasing development of researches in this aspect, researchers began to design specialized academic self-efficacy scales in the field of learning. The academic self-efficacy questionnaire compiled by Pintrich & DeGroot (1990) was divided into two independent dimensions: self-efficacy of learning ability and self-efficacy of learning behavior. There are 11 questions in each dimension, with 22 questions in total. The higher the score, the higher the sense of self-efficacy, according to the five-point Likert scale. The sum of the scores of self-efficacy of learning ability and learning behavior is the total score of academic self-efficacy.

At present, the academic self-efficacy scale which is widely used in China was compiled by Liang and Zhou (2000) of Central China Normal University on the base of the relevant dimensions of the academic self-efficacy questionnaire compiled by Pintrich

and DeGroot (1990). It has achieved remarkable reliability and validity in real measurement and has been widely used in practical research. Therefore, this study measures the academic self-efficacy of private university students in Shandong Province based on the scale compiled by Liang & Zhou (2000) of Central China Normal University.

2.2.4 Relevance between self-efficacy and academic performance

In the educational environment, self-efficacy can affect factors including learners' choices of activities, effort, persistence, interest and achievement (Schunk & DiBenedetto, 2014; Schunk & Usher, 2012; Usher, 2009; Usher & Pajares, 2008). With regard to the relationship between self-efficacy and academic performance, a large number of studies demonstrated that there is a significant correlation between them, that is, mutual influence and mutual promotion between self-efficacy and academic performance. Academic self-efficacy is a vital predictor of academic achievement; academic achievement will influence self-efficacy in turn. By comparing students with different academic achievements, a conclusion could be reached that students with better academic performance have stronger self-efficacy, while students with poor academic performance tend to have lower self-efficacy. The study by Bandura (1977, 1986) and Schunk (1983) showed that students' academic performance can be accurately predicted by their self-efficacy level. Those with high academic self-efficacy have higher academic performance, while those with low academic self-efficacy have lower academic performance. The study of Zimmerman and Martinez-Pons (1988) also show that self-efficacy is closely related to students' academic performance; Miller (1993) and

others revealed that self-efficacy is closely linked to students' academic performance. It exhibited that there is a very significant positive correlation between the sense of learning efficacy and students' academic achievement. Students with high sense of self-efficacy are not only willing to learn, but also good at learning, so as to achieve good academic results.

Studies by Antonio, Komarraju and Nadler (2013) all showed that learning self-efficacy has a positive impact on learning achievement. The higher the learner's learning self-efficacy is, the stronger the individual's learning superiority is, and the better the learning results will be. Many studies in modern learning psychology have clarified that self-learning effectiveness is a crucial factor to produce good learning results, which is also a measurement and evaluation of self-learning ability (Sitzmann, 2013). Feldman (2015) and others have found that academic self-efficacy bears the function of predicting academic achievement. By comparing the relationship between self-efficacy and academic performance of 339 pupils and 507 middle school students, Jiang et al. (2014) have found that the middle school students can predict their academic performance by using self-efficacy, the effect of which is significantly better than that of primary school students. Honicke and Broadbent (2016) mentioned in their systematic review of the impact of academic self-efficacy on academic performance that most studies reported a moderate correlation between academic self-efficacy and academic performance of college students, including some mediating and moderating factors, such as deep processing strategies, goal orientation and so on. From the perspective of social cognition, Grigg, Perera, McIlveen and Svetleff (2018) investigated the comprehensive

model of interaction among adolescents' mathematics self-efficacy, interest, ambition and achievement.

It was discovered that students' previous mathematics achievement and interest in mathematics positively predicted the basic level of students' mathematics self-efficacy, while students' self-efficacy positively predicted mathematics achievement. Stajkovic et al. (2018) tested the effects of three conceptual models on the academic performance of college students in one term. It was shown that self-efficacy is positively correlated with students' academic performance in each model. It was also pointed out that consciousness and emotional stability serve as predictors of self-efficacy and achievement. Studies by Olivier, Archambault et al. (2019) suggested that students' self-efficacy, behavioral engagement and emotional engagement are key factors in academic achievement.

2.3 Learning strategies

Learning strategies are a complicated scheme of learning process that learners design in a purposeful and conscious way so as to improve learning efficiency and effectiveness. They include not only specific cognitive methods but also learners' regulation and control of the whole learning process. As a goal-oriented psychological operation, learning strategies have gradually become a topic which receives extensive attention in educational psychology, learning theory and teaching theory since its rise in the middle and late 20th century. As learners, the selection and application of learning strategies play an crucial part in learning effectiveness. Only by taking full advantage of learning strategies, can students improve self-adaptability and creativity unceasingly.

Existing researches on learning strategies mainly focus on theoretical exploration and empirical research, including the connotation, structure, development and application of learning strategies, and training of learning strategies in teaching.

2.3.1 The implication of learning strategies

Learning strategies have been a heated topic for educators and psychologists since the 1970s, which have also attracted great attention from researchers. According to existing researches, the definition of the connotation of learning strategies mainly focus on three aspects (Shi, 2001). First, learning strategies imply learning procedures, methods and rules. The representatives are Rigney (1978) and Duffy (1982). Second, learning strategies are regarded as the information processing process of learning. This theory is represented by Kail & Bisan (1982), Dansereau (1985), Amiran and Katims (1985), Nisbet and Shucksmith (1986), Mayer (1988). Third, Sternberg (1983) holds the opinion that learning strategies are the combination of learning monitoring and learning methods, the integration of skills and learning regulation. Liu (2000) reckons that learning strategies refer to learners' effective learning procedures, rules, methods, techniques and ways of control in learning activities; Zhao (2005) and others believed that learning strategies are learners' active and effective operations of learning procedures, tools and methods in accordance with the general rules of learning under certain circumstances for certain learning tasks, so as to improve the quality and efficiency of learning. Zhou (2014) pointed out that learning strategies are a series of comprehensive schemes of learning methods and techniques adopted by college students in order to improve their learning efficiency and effectiveness, as well as varied strategies chosen in the specific learning

environment and learning process, during the whole learning process of the university study.

To conclude, it still remains controversial about whether learning strategy is an action or a psychological activity, or both; whether it refers to the total of learning methods or the skills adopted to complete a specific task; whether it is within the scope of learner's subconscious; whether it has a direct effect on the development of learning, and so on. Therefore, in order to comprehensively understand the meaning of learning strategies, the following aspects must be clarified. First, the procedures, rules, methods, techniques and methods of regulation and control which help to improve learning quality and efficiency belong to the category of learning strategies. Second, learning strategies are divided into being implicit or explicit, which is the guarantee of effective individual learning, the internal cognitive processing and control system, as well as the external effective learning procedures, methods, techniques and control methods, thus making it measurable. Third, learning strategies serve as the symbol of whether learners know how to learn, a crucial yardstick of individual learning ability, and an important factor influencing the learning effect. Therefore, the learning strategies in this study refer to the total of a series of learning methods and techniques adopted by students in order to improve their learning efficiency and effectiveness, as well as the different strategies applied in specific learning environment and learning process.

2.3.2 Relevant research on learning strategies

2.3.2.1 The structure of learning strategies

There are diverse kinds of expressions about the connotation of learning strategies. And the standards of structure of learning strategies are also varied. Different researchers have studied the composition of learning strategies from different perspectives (Liu, 2000). The following are representative:

According to the role of learning strategies, Danseau (1985) divided learning strategies into primary strategies and support strategies. The former refers to various learning strategies for direct manipulation of materials, including strategies of information acquisition, storage, information retrieval and application, such as memorization, organization, recall and so on. The latter mainly refers to strategies to help learners maintain an adaptive cognitive atmosphere to ensure the effective operation of basic strategies, which includes strategies of scheduling and time planning, attention allocation, self-monitoring and diagnosis.

Concerning the components of learning strategies, Mackachie (1990) summarized learning strategies as cognitive strategies (including retelling strategies, elaborate processing strategies, organizational strategies), meta-cognitive strategies (including planning strategies, monitoring strategies, adjustment strategies), resource management strategies (including time management, learning environment management, effort management, support from others, helping learners adapt to the environment to meet their own needs). From the perspective of the components which are covered, Weinstein (1986) believes that learning strategies include: cognitive information

processing strategies, such as fine processing strategies; active learning strategies, such as exam-oriented strategies; assistant strategies, such as anxiety management; and meta-cognitive strategies, such as monitoring the acquisition of new information. She and her colleagues designed a scale of learning strategies including ten sub-scales of information processing, selection points, test-taking strategies, attitudes, motivation, time management, anxiety, learning aids and self-assessment. Pintrich and DeGroot (1990) came up with meta-cognitive strategies and cognitive strategies, which have a vital impact on students' academic performance. Meta-cognitive strategies imply the planning, monitoring and adjustment of individuals' knowledge. If they can make efforts and persevere represents, then individuals can eliminate interference and work out hard problems. Cognitive strategies are the strategies used by students in learning, memorizing and understanding learning materials. Based on these three components, a scale was developed to test the effect of the above strategies on academic performance.

Pokay (1990) divides learning strategies into three categories. First, the meta-cognitive strategy, which means the learner's strategy of planning, monitoring and evaluating for their cognitive activities. Second, the cognitive strategy, which means the strategy of organizing and synthesizing new and old knowledge. Third, the resource manipulation strategy, which means the learner's strategy to actively adjust their efforts, effectively use time and create an appropriate learning environment. This is basically in accordance with Mackeachie's (1990) classification of learning strategies.

According to the research above, as for the composition of learning strategies, different researchers hold various opinions, who may classify strategies in different ways.

However, cognitive and meta-cognitive strategies are always considered to be two basic elements of learning strategies. Meanwhile, given the fact that university students have a certain degree learning initiative after primary and secondary stages of learning, and the characteristics of university learning also require students to strengthen their strategies in accessing external resources, personal time management and so on. Hence, this study incorporates resource management strategies into the dimension of learning strategies.

(1) Cognitive strategy

From the classification of learning strategies, we can find that the cognitive strategy is a vital and core component of learning strategies, which are different from and related to learning strategies at the same time. According to Rigney (1978), cognitive strategies are the operations and procedures that students employ to acquire, preserve and extract different sorts of knowledge and assignments. American cognitive psychologist Gagne (1978) studied cognitive strategies systematically, who pointed out that the learning process was modified and regulated by some internal execution control processes. These internally oriented skills are defined as cognitive strategies. When discussing the relationship between the two, he believes that students are learning how to learn, how to memorize and how to contribute to reflective thinking about learning. Apparently, as individuals continue to learn, they tend to study by themselves more often, or even achieve the so-called independent learning. It is assumable that learners acquire more practical skills to control internal processes. (Kuai, 1999). Hence, there is a cause-and-effect relationship between cognitive strategies and learning strategies, that is, the improvement of cognitive strategies is the reason for the improvement of learning

strategies (Shi, 2001). However, generally speaking, learning strategies cover a wider range than cognitive strategies do. Cognitive strategies are an important core component of learning strategies. In the process of learning, the application of learning strategies is centered around the improvement of cognitive level. The acquisition of cognitive strategies perfects learning activities, which is the key factor of learning strategies.

(2) Meta-cognitive strategy

In learning activities, cognitive strategies are indispensable specific strategic knowledge to improve learning efficiency. However, different materials and situations ought to be chosen given different strategic knowledge. The realization of this process is exactly the embodiment of meta-cognitive strategies. According to Flavell et al. (1970, 1979), the main function of cognitive strategies is to help students achieve their cognitive goals in their cognitive activities, while the main function of meta-cognition is to provide students with information about cognitive activities or progress of activities. Meta-cognition refers to people's ability to perceive and direct their own cognitive processes and results. Perception includes knowledge and experience while directing contains the use of strategies or self-regulation which is based on cognitive knowledge. Self-regulated learning refers to the monitoring, control and regulation of students' cognitive activities and actual behaviors, focusing on the strategies used by individuals to plan, monitor and regulate their cognitive processes, rather than meta-cognitive knowledge. Thus, meta-cognitive strategies are also called self-regulatory strategies, which present students' ability to control the direction of their own learning. Students' application of meta-cognitive strategies will have an important impact on learning

activities. Therefore, meta-cognitive ability, just like cognitive strategies, serves as the basis or precondition for effective use of learning strategies. In addition, it also has cause-and-effect relationship with learning strategies, which are another core component of learning strategies.

(3) Resource management strategy

Compared with cognitive strategy and meta-cognitive strategy, resource management strategy belongs to assistant strategy, which is a learning strategy for students to manage available learning resources in learning activities (Zhao & Yang, 2005). For college students' learning, time management of great significance to promote academic success. Learning environment, containing external natural environment and students' psychological environment, such as harmonious teacher-student relationship and classmate relationship, will directly influence students' learning effect. Turning to others for help when confronting difficulties is also of certain importance to achieve learning effect, as it's a kind of effective learning strategy.

To sum up, cognitive strategies are indispensable specific strategic knowledge to improve learning efficiency in learning activities, which mainly contains retelling strategies, elaborate processing strategies and organizational strategies. Meta-cognitive strategies are demonstrated in monitoring and regulating of the whole learning activities, which include planning strategies, monitoring strategies and adjusting strategies. Resource management strategy is a strategy of offering help to learners, boosting various environments and conditions to play a supporting role in learners' learning, including

time management strategy, learning environment management strategy, effort strategy and seeking support strategy.

2.3.2.2 Research on the current situation of learning strategies

Understanding the current situation of learners' learning strategies is a topic which receives wide concern from researchers. With regard to individual differences in cognitive and meta-cognitive strategies, Zimmerman and Martinez-Posn (1990) investigated into individual differences in learning strategies among primary, middle and high school students. It was found that students with high IQ use some learning strategies more frequently than average students, such as organization, transformation, self-reward, self-punishment, seeking help and reviewing records. The use of learning strategies increases year by year from the stage of primary school to junior high school, while decreases year by year from the stage of junior high school to senior high school. Li and Pan (2013) believed that learning strategy is the core element of self-learning, which has a long-term impact on the lifelong development of college students. Therefore, the research on it is not only limited in the stage of fundamental education, but also in the stage of higher education (Luo, 2019). In the aspect of the current situation of the use of learning strategies among college students, Martin (2008) used the Learning and Study Strategies Inventory (LASSI) to investigate this aspect among general institutes of higher education, including Beijing Normal University, Zhejiang University, Zhejiang Normal University and People's Public Security University of China. The results indicated that the overall level of learning strategies used by the students studied does not seem optimistic. Students' awareness of learning strategies remains weak, and generally

learning strategies are not adequate. Zhou et al. (2014) found that there were significant differences about the level of learning strategies among college students in the aspects of gender, grade, major, province, education level of parents, experiences and so on.

2.3.2.3 Study on the influencing factors of learning strategies

On the basis of previous studies, learning strategies are mainly influenced by individual factors, such as personality factors, situational factors, individual motivation, and so on. Oxford and Cohen (1992) believed that learning styles, knowledge background, beliefs, attitudes and motivations are the main factors influencing the acquisition of learning strategies, followed by anxiety, gender and nationality. Hence, factors of individual motivation will affect their learning strategies. Liu (2001) reckoned that the factors affecting learning strategies can be integrated into aspects of personality, situation and emotion and so on, among which personality factors mainly involve ability, cognitive style and related prior knowledge, which remain stable for individuals. Situational factors involve the characteristics, content, difficulty of homework, the background of evaluating homework and homework teaching, which are characterized by unstability. Emotional factors mainly involve motivation. Wang & Liu (2000) argued that there is a significant positive correlation between self-efficacy and learning strategies. When it comes to predicting learning strategies by self-efficacy and intrinsic motivation, the prediction of self-efficacy is relatively more accurate. Li & Pan (2013) believed that college students' learning motivation and achievement attribution will affect their learning strategies. Others reckond that when students have strong learning motivation, they will think of using cognitive strategies to improve learning effect (Yu, 2013). Loh & Teo (2017)

studies demonstrated that the influence of culture on students' learning strategies should not be underestimated.

2.3.3 Measurement of learning strategies

The test and evaluation of learning strategies are of great significance for deep understanding students' current level of learning strategies. Therefore, psychologists come up with evaluation with reference and practical value by employing diverse measurement methods from different perspectives. For instance, Learning and Study Strategies Inventory (LASSI) , which is used to test and assess students' ability to apply learning methods and strategies (Weinstein, 1987), is divided into four dimensions: information processing strategy, motivation and belief strategy, assistant strategy and meta-cognitive strategy. Including ten sub-scales, there are 77 self-reported items, half of which are positive and half of which are negative. Liker 5-point scale is used, and a national norm has been established in the United States. Ten sub-scales are Attitude Scale, Motivation Scale, Time Management Scale, Anxiety Scale, Attention Concentration Scale, Information Processing Scale, Access to Major Information Scale, Learning Aid Strategy Scale, Self-Test Scale and Examination Strategy Scale. The test is convenient to test, scoring fast, the scale structure is scientific and reasonable, and the problem is comprehensive. It is considered to be an ideal tool to test and diagnose students' learning methods and learning strategies. Pintrich and DeGroot (1990) compiled corresponding scales based on meta-cognitive strategies, cognitive strategies and whether or not efforts and persistence were included in cognitive strategies. In the process of determining factors, whether efforts and persistence were included in cognitive strategies was named

"self-regulation"variable scale. At the same time, another determinant was cognitive strategies, called "cognitive strategies" scale, which involved strategies including retelling, refining and persistence. Organization. Retelling refers to learning through memory and recitation, refining links knowledge points through understanding, and organization is the key point of refining information and summarizing. The scale was integrated into the Motivated Strategies for Learning Questionnaire (MSLQ). It has been widely used and proved to have good reliability and validity.

Considering the characteristics of Chinese students, Chinese researchers have done a lot of work on the scale of learning strategies. Zhou and Zhang (2003) compiled the *Learning Strategies Scale for Middle School Students* to assess students' use of cognitive strategies and meta-cognitive strategies as one of the indicators of students' self-regulated learning level. This scale is based on self-regulated learning theory, information processing theory and related learning strategies at home and abroad. It is designed according to the actual learning situation of middle school students in China. The scale was scored by 1 to 5 points, including cognitive strategy sub-scale and regulatory strategy sub-scale, namely meta-cognitive strategy scale. There are all together 16 items in the cognitive strategy sub-scale, involving shallow processing strategy, deep processing strategy and retrieval application strategy. Nineteen items are mentioned in the regulatory strategy sub-scale. The sub-scale mainly tests how students supervise, coordinate, arrange and adjust their learning behavior reasonably during the whole learning process. It is used to measure students' use of meta-cognitive strategies, which

include self-planning strategy and supervision. At present, inspection strategy, feedback adjustment strategy and self-summary strategy are widely used among Chinese students.

The questionnaire on University Students' learning strategies designed by Zhao and Yang et al. (2005) mainly consists of meta-cognitive strategies, affective strategies and resource management strategies. The questions are rated on a scale of 1 to 5, from total disagreement to complete agreement. This initial questionnaire was used for pre-test and factor analysis of the results, of which four factors were successfully extracted. According to the contents of each factor, the four sub-scales are named meta-cognitive strategy, affective strategy, cognitive strategy and resource management strategy. The reliability coefficient of the revised questionnaire is .93, and the split-half reliability coefficient is .85, reaching the significant level.

2.3.4 Relevance between learning strategies and academic performance

Learning strategies are significant factors influencing students' academic performance. Many studies have pointed out that appropriate learning strategies have a positive impact on students' learning achievement, which are directly related to academic achievement. Learning strategies are one of the best variables to predict academic achievement (Mizelle, 1993; Pintrich & DeGroot, 1990). Four hundred and thirty two junior high school students were tested in an experiment by Li (2007). Via questionnaires, it was found that learning strategies have a remarkable and direct impact on academic performance. The higher the level of students learning strategies, the more satisfying their academic performance will be. Oxford and Ehrman (1995) surveyed 520 American learners to prove the proposition that learning strategies are vital for successful learners.

The results showed that there is an obvious correlation between cognitive strategies and academic performance. Zhou et al. (2014) studied the use of learning strategies, the relationship between learning strategies and the variables of students' background characteristics among 7594 students from 18 universities in three provinces of eastern, central and Western China. The results showed that there were significant differences in the use of learning strategies among students with different grades. And students with better grades have a higher level of learning strategies employment.

In 12 study searches concerning the relationship between learning strategies and academic performance, Broadbent and Poon (2015) discovered positive correlation of time management strategies, meta-cognitive strategies, effort adjustment strategies and critical thinking strategies with academic performance. Xu (2016) considered that learning strategies had a predictive effect on academic achievement. Kimberly and Anupama (2016) considered learning strategies as an important predictor of task performance after assessing 96 undergraduates. Geller et al. (2017) found that students' beliefs about learning and learning strategies are linked to academic achievements. Students with better performance prefer more effective learning strategies, who are more reluctant to learn by rote. Instead, they are more likely to make study plans ahead of time. Luo (2018) reckoned that junior high school students' English learning motivation and learning strategies affect their academic performance to varying degrees, and that learning motivation also indirectly influences their academic performance via learning strategies. Roick and Ringeisen (2018) studied the effects of learning strategies, especially cognitive strategies and meta-cognitive strategies, on students' math scores.

With statistics of 206 college students as samples, the study found that cognitive strategies and meta-cognitive strategies were positively correlated, and meta-cognitive strategies have positive relationship with math test scores. Besides, it was also proposed that suggestion intervention will be beneficial to help students develop their awareness of comprehensive use of cognitive strategies and meta-cognitive strategies. When Husmann and O'Loughlin (2019) studied students' learning styles, they have found that some specific learning strategies are positively correlated with their final scores.

In a nutshell, the ultimate goal of employing learning strategies boils down to effective learning. From the perspective of different learning strategies and structures, whether from the psychological process of learning, or from the learning content and activities, effective learning is the key point that ought to be caught. Students need to choose appropriate rules and corresponding explicit operating procedures according to the learning objectives, learning tasks, learning time requirements, the nature of learning materials and the characteristics of learning itself to achieve this effective learning process. College time is an important period for individuals to form effective learning strategies, especially professional learning strategies. It is still a significant issue that deserves attention for researchers to deeply understand the current situation of university students' learning strategies, to guide students to master and use learning strategies suitable for themselves, and promote effective autonomous learning.

2.4 Academic performance

Generally speaking, the evaluation for students' learning results or outcomes is needed after a period of studying. In terms of evaluation methods, there are process

evaluation and summative evaluation; in terms of evaluation ways, they can be formal and standard accomplishment test, or informal, subjective perception form teachers or learners; in terms of evaluation indicators of learning outcomes, they can be test scores, or certain behavior change. For most schools, students' academic performance is one of the indicators of learning outcomes, which is able to objectively reflect their learning ability and outcomes. The purpose of school education is to give students a better chance to learn how to learn through finding out the relationship between learning psychology and academic performance. Therefore, grades ares not the opposite side of studying, since that students can get good grades through their own efforts in certain field, and good grades can in turn promote more studies. Accordingly, this study regards students' academic performance as the basic evaluation indicator of their learning outcomes.

Influenced by the thought of "examination-oriented education", for a period of time, "a piece of paper" was the only indicator of students' learning outcomes in Chinese universities exams, which was bad for students' comprehensive development, and put limitations on the coordinating development of their knowledge, abilities and qualities. With the accelerating popularization of higher education, many universities start from changing the assessment methods to bring the evaluation, guidance and motivation function of assessment in students' learning process into full play, and also establish a real-time teaching feedback and various assessment methods, thus promoting the coordinating development of students' knowledge, qualities and abilities, and improving their ability to learn autonomously and independently. Therefore, the assessment method which takes into account both knowledge and abilities, both final exam grades and

process performance is adapted by most universities. Based on this, this study will divide students' academic performance into two parts: process assessment performance and final exam performance. Process assessment goes through the whole teaching process, and has diverse contents. It especially examines students' ability to analyze and solve problems and the ability to practice. It attaches great importance to the development of their practical ability, innovative awareness and learning ability, promotes their character development, and fully arouses their enthusiasm, initiative and creativity. This assessment mainly includes close-book examination, open-book examination, oral test, achievement examination (comprehensive documents survey reports, designing project training, works exhibition, subject thesis, etc.), knowledge competition, computer online test and other daily assessment methods. Therefore, this assessment can better reflect students' learning behavior, learning process and especially comprehensive qualities and abilities in some way. Final exam is a comprehensive assessment taken by teachers in accordance with syllabus, which mainly reflects students' mastery and appliance of knowledge.

$$\overline{X} = \frac{X_1 f_1 + X_2 f_2 + \cdots + X_n f_n}{\sum_1^n f_n}$$

Note: Compiled by researcher

Since that students may have various courses at the same time, the course credits may differ. In order to more objectively and comprehensively reflect students' learning performance and learning situation, the academic performance tested by this study consists of all the compulsory courses grades before this study, which are provided

by the Academic Affairs Office of the subject universities. The way to calculate students' studying grades is as follow: to calculate the standard deviation of the same course in the same grade in accordance with the course code, thus getting the standard scores of the course; to convert the score into T-score, and finally get a weighted mean which will be the final grades.

In this formula, $\overline{X}$ represents the weighted mean of a student's grades, Xn represents the original score of each course, and fn represents the credit of each course.

2.5 The Relationship between achievement goals, self-efficacy and learning strategies

2.5.1 The study of the relationship between achievement goals and self-efficacy

Achievement goals is the combination of motivation factors and social cognitive factors, and self-efficacy, in its nature, is one of the motivation theories. Therefore, the relationship between achievement goals and self-efficacy is close as well as complicated, which may differ from one another due to different research perspectives. Anderman and Young (1994), Middleton and Midgley (1997) hold the view that mastery goal and performance-approach are positively correlated with self-efficacy. Coutinho and Neuman (2008) believed that the skilled-method and performance-method goals are positive-prediction factors of self-efficacy. During the process of studying 249 high school students aging from 14 to 19 years old, Walker and Greene (2009) found that there was a significant positive correlation between mastery goal, performance-approach goal and self-efficacy. When doing researches on 162 psychology majors, Jagacinski (2010) has found that mastery goal and achievement-approach goal are significantly positively

correlated with academic self-efficacy, while performance-avoidance goal was significantly negatively correlated with academic self-efficacy. This finding coincided with that of Hsieh, Cho, Liu and Schallert's research (2008) on 549 middle school students. Nasiriyan et al . (2011) surveyed 280 seniors in high school, and the results show that self-efficacy is significantly positively correlated with mastery goal, performance-approach goal, academic efforts and academic performance, while significantly negatively correlated with performance-avoidance goal.

As for the impact path, the result of the research made by Deemer (2010) on 228 doctoral students majoring in counselling psychology suggested that the mastery goal was able to significantly positively predict academic self-efficacy. Zheng (2011), Chen (2011), Zhu (2012), Li and Yang (2018) have found that self-efficacy has played an intermediary role when achievement goals exerted an influence on academic performance. Huang (2016) analyzed the relationship between achievement goals and self-efficacy by drawing 148 samples, finding that the correlation between mastery, mastery-method goal and self-efficacy was form medium to strong, while that between performance-avoidance goal, mastery-avoidance goal and self-efficacy are relatively low. Uçar and Sungur (2017) found that students' perception of classroom goal structures (i.e. motivation task, autonomy support and mastery assessment) was an important prediction factor for their self-efficacy.

When Xiaoxin and Jianling (2019) studied the role played by achievement goals and academy in the relationship between self-efficacy and self-directed learning, they found that different achievement goals had different impact paths on high school

students' self-directed learning. Both mastery goal and achievement-avoidance goal affected self-directed learning indirectly through part of the intermediary role played by self-efficacy of learning ability and self-efficacy of learning behavior. While achievement-approach goal did this only through part of the intermediary role played by self-efficacy of learning ability.

To sum up, this study believes that a goal is the beginning part of one's study, and self-efficacy reflects one's confidence in achieving the goal. To realize the achievement goals, it needs to stimulate one's motivation, but after setting down the goal, self-efficacy, as one's attitude to realizing it, will affect the result in a direct way.

Accordingly, this study presumes that students' self-efficacy plays an intermediary role between achievement goals and academic performance (H_{2a}).

2.5.2 The study of the relationship between achievement goals and learning strategies

Achievement Goal Theory presumes that students who have set a goal mainly aim to acquire knowledge and skills when studying; therefore, they will utilize learning strategies of deep treatment like understanding instead of that of remembering. While students who have set performance-approach goal want to prove that they surpass others by doing better in exams, therefore they may use low level learning strategies such as reciting and remembering. As for students of performance-avoidance will seldom use learning strategies for fear that others regard them as incompetent (Dweck & Legget , 1998; Middleton & Midgley, 1997). Researchers including Ames (1992) found that students who had set mastery goals used more efficient learning strategies, worked hard

to find out deep reasons, held positive attitude towards their studies, and had higher academic efficacy, stronger studying motivation and better studying attitude. Li and Yu (2002) have found that mastery goals have a significantly positive influence on students' choice of learning strategies, while the relationship between performance-approach goals and learning strategies was not prominent. Bong (2009) has found that approaching goal is related to cognitive strategies and self-regulation, while performance-avoidance goal is not. Ranellucci and Hall (2015) indicated that achievement goals affect students' learning strategies through influencing their emotion. Performance-avoidance goal predicted the feeling of being bored and anxious, thus affecting one's time management. Through empirical studies on the relationship between university students' achievement-goal orientation, meta-cognitive strategies and academic performance, Zhang (2019) has found that students' achievement-goal orientation not only affects their academic performance directly, but also affects it indirectly through meta-cognitive strategies, that is, meta-cognitive strategies have played an intermediary role between achievement-goal orientation and academic performance.

Based on the above studies, the hypotheses of this study is achievement goals affect students' academic performance through learning strategies (H_{2b}).

2.5.3 The study of the relationship between self-efficacy and learning strategies

As the core concept of Social Cognition Theory, self-efficacy can affect individuals' thinking, motivation and behavior directly (Bandura, 1977). Self-efficacy will have an influence on students' appliance of learning strategies. According to some studies, students who have higher self-efficacy incline to utilize more cognitive and

meta-cognitive strategies to supervise the accomplishment of academic tasks. For example, students, no matter in middle school or university, who have relatively high self-efficacy use learning strategies more frequently than those who have low self-efficacy, and also have a stronger task persistence. Given that self-efficacy is positively correlated with cognitive and control strategies. Therefore, students who believe they can do a good job in their academic career are more likely to devote more cognitive efforts to their studying materials (Pintrich, 1989; Pintrich & De Groot, 1990; Pintrich & Garcia, 1991; Pintrich, 1999); Dong and Zhou (1995) also found that students' self-efficacy can predict their appliance of learning strategies.

Lin (2002) holded the view that a learner's self-efficacy is related to his emotional reaction to his academic pressure, and different levels of self-efficacy can control and maintain one's studying motivation, and adjust his reaction to the academic pressure. Hence, academic self-efficacy is closely connected with the appliance of learning strategies and the self-monitoring of the appliance. Students who have high efficacy use more learning strategies than those who have low one, and also monitor their learning results much more (Zhou, 2007). When studying the relationship between self-efficacy, the appliance of self-adjustment learning strategies and academic performance, Wilson and Narayan (2016) found that the higher task self-efficacy learners had, the better task performance they would show. And those who applied more leaning strategies to each sub-task would also have higher performance. Cai and Yang (2019) did a survey on 901 ethnic minority university students to study the relationship between academic self-efficacy, learning strategies and academic performance, finding that

academic self-efficacy have a positive influence on learning strategies and academic performance, learning strategies can positively predict academic performance, and learning strategies play part of intermediary role during the process when academic self-efficacy influences academic performance.

According to the researches above, self-efficacy is significantly related with students' learning strategies. This study hypothesizes that self-efficacy can affect their academic performance indirectly through learning strategies (H_{2c}).

All in all, this study will explore the relationship between students' factors-achievement goals, self-efficacy, and learning strategies-and their academic performance. After literature discussion, it's obvious to find that all the present studies attach great importance to the role achievement goals, self-efficacy, learning strategies play in students' learning process. However, studies on the influence of students' achievement goals, self-efficacy and learning strategies on academic performance are rare, and the conclusions varies in some way. Therefore, starting from the learning characteristics of private university students in Shandong Province, this study explores the influence made by achievement goals, self-efficacy and learning strategies on students' academic performance.

CHAPTER 3

RESEARCH METHODS

After analyzing the relevant theories and studies on achievement goals, self-efficacy, and learning strategies with the purpose of further exploring the relationship between these factors and the academic performance of students at private universities in China, this study utilizes information collected mainly through administration of a quantitative questionnaire, complemented by the qualitative method of focus group interviews. The quantitative part mainly utilizes the questionnaire mentioned in the last chapter, which has been tested. To further confirm the reliability and validity of the questionnaire in this study, prior predictions and adjustments have been made. In terms of the focus group interview, this study utilizes an interview question outline based on the information gathered from the questionnaire, thus extending its content and providing deep information to verify the findings. The respective explanations for the research framework and hypothesis, research subject, research method, research tool, implementation procedure, and data processing method are as follows.

3.1 The research process

This study mainly explores the relationship between achievement goals, self-efficacy, learning strategies and academic performance of students at private

universities in Shandong Province, with questionnaire survey as its main research method. In accordance with the research background and motivation, this study determines its research direction, purpose and issues. After finishing the literature review of relevant theories and studies about achievement goals, self-efficacy, and learning strategies, the research framework is finally formulated. The rest of the process includes: to choose the research tools, to take pre-test and formal test, to collect and process the information, to analyze and discuss the research results, to write the research report, and to put forward concrete conclusions and suggestions. The research flowchart is shown in Figure 3.1.

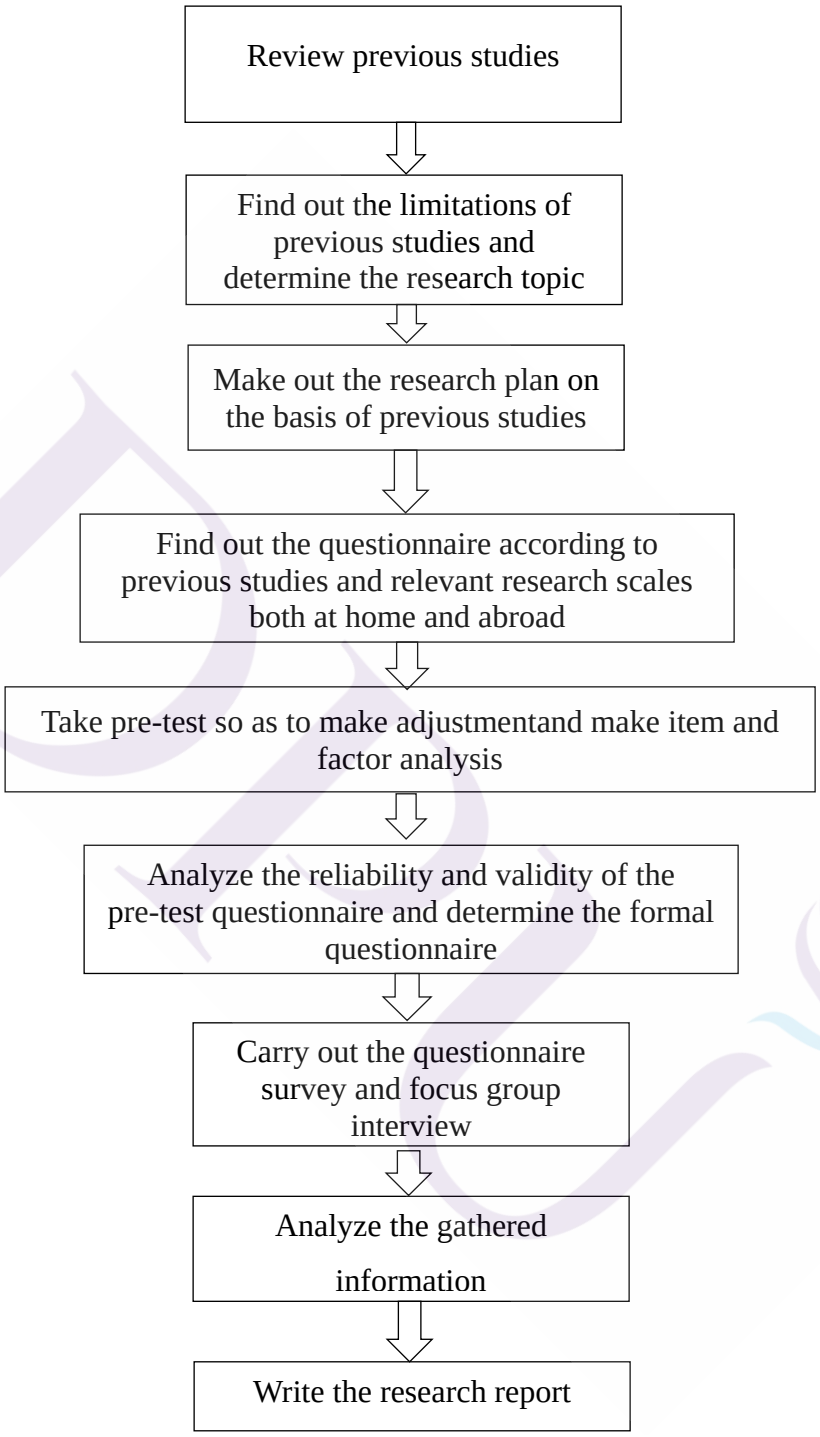

Figure 3.1 The research flowchart

3.2 The research framework and hypothesis

3.2.1 The research framework

This study aims to explore the relationship between achievement goals, self-efficacy, learning strategies and academic performance of students form private universities in China. According to relevant studying results, achievement goals, self-efficacy, and learning strategies interact with any other and all of them have influence on academic performance. Therefore, this study refers to relevant research literature and proposes the research framework as shown in the figure below:

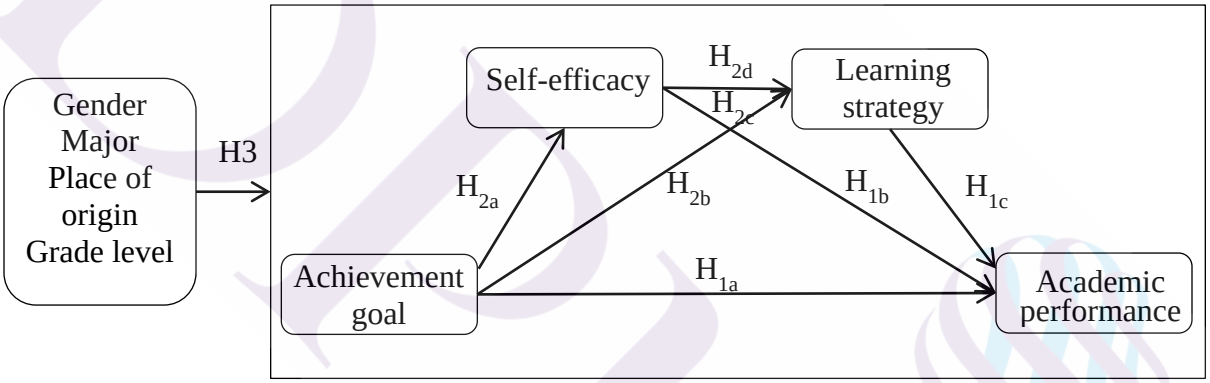

Figure 3.2 The research framework

Sourse: Li and Xu (2007); Stizman (2013); Zhou et al. (2014); Zhang (2019) ; Cai and Yang (2019)

According to Fig. 3.2, students at private universities are this study's subject; achievement goals consist of four dimensions: mastery-approach goal, mastery-avoidance goal, performance-approach goal, and performance-avoidance goal; self-efficacy is

divided into learning ability and learning behavior; learning strategies are comprised of meta-cognitive strategies, cognitive strategies and resource management strategies.

3.2.2 The research hypothesis

H1：There are differences in achievement goals, self-efficacy and learning strategies among students from different backgrounds in private universities in Shandong Province.

H2：Achievement goals, self-efficacy and learning strategies of students at private universities in Shandong Province have a significant influence on their academic performance.

H_{2a} Achievement goals of students at private universities in Shandong Province have a significant influence on their academic performance.

H_{2b} Self-efficacy of students at private universities in Shandong Province has a significant influence on their academic performance.

H_{2c} Learning strategies of students at private universities in Shandong Province have a significant influence on their academic performance.

H3：Self-efficacy and learning strategies of students at private universities in Shandong Province play an intermediary role in achievement goals and learning strategies.

H_{3a} Self-efficacy of students at private universities in Shandong Province plays an intermediary role in achievement goals and academic performance.

H_{3b} Learning strategies of students at private universities in Shandong Province plays an intermediary role in achievement goals and academic performance.

H_{3c} Learning strategies of students at private universities in Shandong Province plays an intermediary role in self-efficacy and academic performance.

H_{3d} Self-efficacy and learning strategies of students at private universities in Shandong Province play a double intermediary role in achievement goals and academic performance.

3.3 The participants

3.3.1 The participants

This study takes students at private universities in Shandong Province as the participants. The development of higher education plays an extremely important role in the development of various fields in Shandong, a major province with quality education, large population and abundant resources in China. In recent years, its private higher education has achieved rapid development. According to the 2017 yearly Statistic Gazette of the Educational Development of Shandong Province, there are 40 non-governmental undergraduate and junior colleges, with 364400 students studying there, accounting for 18.08% of the whole population of university students in Shandong Province. The number of private undergraduate colleges is 23 (ranking the forefront in China), and junior colleges 17. During the development of private higher education in Shandong Province, some private undergraduate colleges have made great progress, enjoying a relatively high status and having great influence in terms of student number, infrastructure construction, teaching quality and other aspects.

This study takes students from three private undergraduate universities in Shandong Province as its main sample sources. These three universities may be run by a

group or individual, but the number of their majors and students is qualified to represent the development direction of private universities in Shandong Province, thus being representative of studying students' learning behavior. Meanwhile, as the researcher of this study, I have been engaging in teaching and management work in private universities, thus being familiar with these students' learning situation. Besides, my job offers me a chance to further know their learning situation. Therefore, this study takes students from private universities in Shandong Province as its research subject.

3.3.2 The source of samples

At present, private universities in Shandong Province are mainly located on 12 regions and cities, such as Jinan, Qingdao, Yantai, and Zibo. In terms of undergraduate colleges, there are 7 in Jinan, 6 in Qingdao, 5 in Yantai, and 1 to 2 in other regions. Therefore, this study mainly uses the method of purposive sampling, which means taking Jinan, Qingdao and Yantai, where there are enough and qualified private universities, as its sampling areas; then chooses one private university from each of the three cities as the one where samples are from.

3.3.3 Questionnaire survey

3.3.3.1 The entire population

According to the formula for defining the sample size put forward by Levy and Lemeshow (1991), the number of total samples is determined in line with the population of students form private universities in Shandong Province. To refer to the formula for minimum sample size of simple random sampling: $n=Z^2*\sigma^2/e^2$, in which, *n* represents the needed minimum sample size, and *e* represents the acceptable sample error. The smaller

the acceptable sample error is, the bigger the needed sample size will be. In this study, the acceptable sample error is 3%. Z represents the confidence level of standard error, which shows the reliability of estimated results. The higher the confidence level is, the bigger the required sample size will be. The general confidence level is 95%, accordingly, z=1.96. This study mainly researches undergraduate students from private universities in Shandong Province, and the confidence level is 90%, accordingly, z=1.64. σ is variance, which represents dispersion degree among samples. P is the standard deviation of the target population (in general, 50% is recommended). When P=0.5, σ =p(1-p) - its maximum, which means variance gets its maximum. Through calculating, the minimum sample size is 747, therefore, in this study, 750-1000 samples will be studied.

3.3.3.2 Samples from the three selected universities

The special information of selected samples is shown in Table 3.1.

Table 3.1 Table of sample situation

School code	Sample size	Interviewees
YC	350	7
BH	370	5
NS	280	4
Total	1000	16

3.2.4 Focus group interview

With the purpose of improving the explanatory power of research materials, focus group interview is taken as the complementary research method. By carrying out

the way of purposive sampling, 16 undergraduate students who have not participated in the questionnaire survey are chosen as interviewees. The specific information of the interviewees of focus group interview is shown inTable 3.2.

Table 3.2 The specific information of the interviewees of focus group interview

Code name	Gender	Grade	Major
1A	M	2018	Mechanical design and manufacture and automation
1B	M	2018	Automobile service engineering
3A	F	2018	Automobile service engineering
2A	F	2017	Civil engineering
2B	M	2016	Civil engineering
3B	F	2017	Computer science and technology
2C	M	2017	Computer science and technology
2D	F	2018	Mechanical design and danufacture and automation
1C	M	2016	Logistics management
1D	M	2017	Nursing science
1E	F	2017	Nursing science
1F	F	2017	Preschool education
3C	F	2016	Logistics management
3D	F	2018	Business english
2E	F	2017	Preschool education
1G	M	2018	Business english

3.4 The research method

This study collects information mainly through questionnaire survey, with focus group interviews as a complement.

3.4.1 Questionnaire survey

After collating and analyzing relevant papers, the researcher selects proper questionnaire based on previous ones and in line with the condition of China’s higher education, which mainly covers the contents about achievement goals, self-efficacy and

learning strategies. The scale of achievement goals is the Chinese version translated from the one formulated by Elliot and McGregor (2001) by Xiao (2013, 2016) and his colleges, who are researchers form China's mainland, with the authors' consent and it consists of four dimensions; The part of self-efficacy is adapted from *Academic Self-efficacy Scale*s from Central China Normal University formulated by Liang and Zhou (2000); the part of learning strategies is adapted from *College Students' Learning Strategies Questionnaire* formulated by researcher Yang (2005).

After the pre-test in selected schools, the above questionnaire is further improved into the formal one, and then is carried out. Statistics and analysis of information collected from subjects is followed in order to explore the key topic of this study.

3.4.2 Focus group interview

Focus group interview is carried out with the purpose of strengthening the result of questionnaire survey. It takes the form of interviewing students face to face. Focus group interview is quantitative or qualitative oriented, which is led by the researcher on the basis of broad questions. This study extends the materials collected from questionnaire and formulates interview outline to gather relevant information which is used to assist the questionnaire result. Before analyzing the interview contents, the researcher numbers, records and highlights the key points and words expressed by interviewees, and then analyzes the core information after classification, thus getting the core contents of this study.

3.4.3 The collection and collation of students' academic performance

Students' academic performance in this study mainly refers to the course grades of school year, which is obtained after the communication with Academic Affairs Office of the subject universities. Given that T-score has replaced absolute score in daily test after the reform of Gaokao, and with the purpose of explaining the meaning of scores in a better and more scientific way, this study plans to use weighted T-score to do conversion and measurement. The explanation of how to calculate weighted T-score is as follow:

3.4.3.1 The conversion of standard scores. Standard scores is a measurement obtained through calculating the deviation between row scores--the original score of the test--and the average score divided by positive or negative standard deviation. It is an important concept in measurement of education (Li, 1987). The formula is as follow:

$$Z = \frac{X - \bar{X}}{S}$$

Z represents standard scores, X represents row scores, $\overline{X}$ represents the average of row score, and S represents the standard deviation of row score.

Z-score regards the average of row score as zero, standard deviation as measurement. The average of Z-score is zero, and it can be positive or negative. When Z-score is greater than zero, this student's grades is higher than the average, on the contrary, when it is smaller than zero, this student's grades is lower than the average.

3.4.3.2 The conversion of T-score. Given that standard scores can be positive or negative, it's inconvenient for exam evaluation, statistics and analysis, and against the

common way of evaluation as well. Therefore, a further conversion is made according to the following formula put forward by McCall in 1929 (Li, 1987). As a convenience for analysis, this calculated result is called T-score.

T=50+10Z

T=50 represents the average level; T ＜50 under the average level; T＞50 above the average level.

3.4.3.3 The calculation of the weighted T-score. Given that different subjects play different roles in students' academic performance, this study calculates the weighted average in line with the credit of each subject. The weighted average of T-score is deemed as the final standard to evaluate students' academic performance. The relevant formula is as follow:

$$T_W = \frac{\sum W_i T_i}{\sum W_i}$$

T_W represents the weighed T-score, which is the standard measurement of academic performance in this study; W_i represents the credit of each subject; T_i represents the T-score of each subject.

3.5 The instruments

3.5.1 The scale of achievement goals

This scale is formulated by Elliot and McGregor (2001), and its Chinese version has been analyzed by Xiao（2013）in terms of its reliability and validity when applied for university students in China. There are 12 items in this questionnaire, including the following dimensions: performance-approach, mastery-avoidance,

mastery-approach and performance-avoidance. There are 3 items in each dimension. Being widely accepted in different countries around the world, this scale is a widely used tool to measure achievement goals. The full score is 7-point in this scale (1=*strongly agree* to 7= *strongly disagree*). The scores of each item in the same subscale are added up to get the goal-orientation scores of four subscales. The total points are from 12 to 84. Through analysis, the internal consistency reliability of the full scale and its subscales is relatively high, and they have a great homogeneity reliability, which means the factor model of the Chinese version of AGQ has a great matching attribute and a high structure validity. In terms of Cronbach's alpha, the internal consistency reliability of the full scale is .83, and that of each factor is between .72 to .88. The average correlation coefficient among items: The average correlation coefficient among items of the full scale is .30, that of each factor is between .40 and .57. The correlation coefficient between each factor and total score is between .54 and .77, and that among each factor is between .06 and .61. The result proves that each factor has a high structure validity. See Appendix 1 for the formal questionnaire.

3.5.2 The scale of academic self-efficacy

This scale is adapted from the questionnaire formulated by Zhou (2000) from Central China Normal University who consults the relevant dimension in the questionnaire of academic self-efficacy formulated by Pintrich and DeGroot (1990). This scale divides academic self-efficacy into two independent dimensions: Self-efficacy of learning ability and self-efficacy of learning behavior. Self-efficacy of learning ability refers to the judgement and confidence an individual has for whether he has the learning

ability to finish his academic career smoothly, get good grades and avoid academic failure. Self-efficacy of learning behavior refers to the judgement and confidence an individual has for whether he is able to use some learning approaches to achieve his learning goals. This scale uses 5-point (1= *very true of me* to 5= *not very true of me*), and the higher the score, the higher the self-efficacy will be. The sum of scores of these two dimensions is the total score of academic self-efficacy. The Cronbach's alpha of the two dimensions is .794 and .616 respectively, and that of the scale is .817. See Appendix 2 for the formal questionnaire

3.5.3 The questionnaire of learning strategies of college students

This questionnaire is adapted from *College Students' Learning Strategies Questionnaire* formulated by researcher Yang (2005), and three dimensions of meta-cognitive strategies, cognitive strategies and resource management strategies are chosen. The evaluation is divided into five degrees, respectively represented by 1-5 points. The lower the score, the higher the learning strategies level will be. The internal consistency reliability of this questionnaire is .933. According to the statistics, this questionnaire has a great test reliability, and high consistency among items, thus meeting the standard of psychometric indexes. In terms of validity, it reaches a significant level both among subscales and between subscales and the total scale, which indicates that this questionnaire has a great content validity. In the meanwhile, when the researcher takes the students' studying grades and the correlation coefficient among each subscale as the criterion-related validity of this questionnaire, the correlation between each subscale and students' academic performance has reached a significant level, which indicates that this

questionnaire has a great criterion-related validity. See Appendix 3 for the formal questionnaire.

3.6 Implementation procedure

3.6.1 Questionnaire survey

There are three main stages in the implementation procedure of the questionnaire survey: the selection or adjustment of research tool, the analysis of pre-test and the analysis of formal materials. After the analysis of pre-test, the research tool was adjusted to meet this survey's demand, and then used to carry out the formal questionnaire survey. The samples of this study are form Jinan, Qingdao and Yantai. Samples' features are prominent and the sample size is specific. The survey in universities in Jinan, Shandong was carried out by the researcher in person. In terms of the survey in Qingdao and Yantai, the researcher sent the questionnaires to people concerned by e-mile and authorized them to hand out and take back the questionnaires. When carrying out the survey, both the researcher and people concerned were required to explain related issues, retrieve and check the questionnaires one by one. Respondents who missed out questions were asked to complete them immediately.

A total of 1000 pieces of questionnaires were handed out. When carrying out the survey, the researcher retrieved and checked the questionnaires one by one, and explained related issues before filling them out. In the meanwhile, filling instructions were attached to the questionnaires sent to the other two universities, with the purpose of assisting people who carried out the survey. The number of retrieved questionnaires is

951, and the recovery rate is 95.1%. After excluding 78 pieces of questionnaires that are incomplete and have over-focused answers, the number of valid questionnaires is 873.

3.6.2 Focus group interview

This study uses the information collected from focus group interview to further verify and enrich the questionnaire results. After analyzing the questionnaire results, the researcher formulated interview outline and invited other experts to make inspections before setting down the interview contents. After choosing interviewees in line with purposive sampling, the researcher went to the interviewers' universities and acted as the interviewer in person. During the interviewing process, the interviewer recorded interviewees' answers by sound recorder, and in the meantime, did not restrict their answering process, and expanded the question contents and directions according to their answers. The interviewing outline is as follow:

Subjects: undergraduate students from Grade1, 2, 3.

Interviewees: 8 science and engineering majors, 8 literal art majors; among them, 6 from Grade 1, 6 from Grade 2, and 4 from Grade 3.

Interviewing outline:

Q 1: During your college life, what's your learning goal or what's your ideal state like? Do you prefer getting good grades or improving personal comprehensive ability, and why?

Q 2: In terms of course learning, which one is more important for you, understanding the course contents or merely getting good grades, and why?

Q 3: How do you feel when you get unsatisfying grades in final exam? “feel nothing” or “fell embarrassed”? And why?

Q 4: Do you have the problem-solving ability when studying and can you keep persistent until getting satisfying grades?

Q 5: Will your academic performance influence your judgement on your personal learning ability?

Q 6: Do you have some great learning methods to share? For example, previewing, listening to teachers carefully and making notes at class, reviewing, introspecting yourself and making improvements, or often discussing with teachers and classmates, making full use of library, and so on. Among the above you’ve mentioned, which one or ones do you think more important?

Q 7: Do you believe or not that there exists certain relationship between a student’s ideal state and his judgement on his ability?

Q 8: What kind of factors do you believe are most important when trying to get good grades? Please describe your answer with several key words.

The materials collected from the focus group interview mainly acts as supplement to the results of questionnaire survey. Analysis of the materials followed the interview. The researcher first recorded and collated the key points and words expressed by the interviewees, and analyzed the core information, that is: the construction of the class hierarchy. After collating topic materials, the researcher designated them properly in accordance with their contents, then made classification and comparison based on the subjects, and finally numbered and named those of same attributes. The names are mainly

from the existed concepts in literature review, with the purpose of forming the core point of this study. In the researching results and discussions of Chapter 5, the key points of the interview will be used to strengthen the analysis evidence of questionnaire survey.

3.7 Analytical method

To verify its suitability, three scales in this research tool were pre-tested. All three scales belong to the field of psychology and attitude, with the subjects rating their feelings towards the items on a Likert scale using the multiple-choice method. There was no division of right or wrong answers, so it was suitable to test them using item analysis and factor analysis. After the questionnaires were collected, the invalid questionnaires were first eliminated, and the valid questionnaires were coded into the SPSS statistical system. In a small number of questionnaires, there were omissions that prevented them from being analyzed using appropriate statistical methods. In the comprehensive analysis of all index elements, KMO and Bartlett's tests were carried out on the samples to determine whether the analysis effect of the samples was suitable for factor analysis. In factor analysis, if the null hypothesis is rejected, it means that factor analysis can be performed; if the null hypothesis is not rejected, it means that these variables may provide some information independently and are not suitable for factor analysis.

In terms of questionnaire pre-test subjects, 300 students from three private universities in Shandong Province that are developing rapidly and have a large student population and a certain representativeness were selected as research samples by means of purposive sampling. In the preliminary test, 300 questionnaires were sent out, and 293 were returned (the return rate was 97.8%). In addition to 14 invalid questionnaires

containing incomplete or inappropriate answers, 279 valid questionnaires were collected (a 93% effectiveness rate). The distribution and return rate of the questionnaires are shown in Table 3.3.

Table 3.3 Pre-test questionnaire distribution and recycling schedule

Item		Distribution	Return	Valid	Effective percentage
Grade	Grade1	80	79	78	98.73%
	Grade2	122	120	111	92.50%
	Grade3	98	94	90	95.74%
Gender	Male	156	156	145	92.95%
	Female	144	144	134	93.06%
Major	Science and Engineering	185	180	172	95.56%
	Literature and History	115	113	107	94.69%
Place of origin	Town	71	70	62	88.57%
	Village	229	223	217	97.30%
Total		300	293	279	95.22%

3.7.1 Pre-test analysis

The item analysis includes descriptive statistics, a t-test, and a correlation test. According to the item analysis strategy of Qiu Haozheng (2010), this study diagnosed the problems according to the descriptive statistical evaluation method and identified the problems with low discrimination degree through the mean, skewness, and kurtosis of the statistical problems. The independent-samples t-test was used to examine the difference between the high score group (the top 27%) and the low score group (the bottom 27%) in the mean of questions. The larger the *t* value and the statistical significance level (two-tailed), the better the discrimination degree of the items on the scale. In other words,

the larger the *t* value, the greater the difference between the high and low scores, and the higher the identification degree. At the same time, the *t* value must reach a statistical significance level of .01. In addition, to examine the coefficient of production-moment correlation, the correlation test determines the Cronbach's alpha coefficient for internal consistency of the scale and judges the quality of each item on the scale due to the change in the Cronbach's alpha coefficient after deletion of the item. The correlation analysis is used to understand the correlation between the scores of each item on the scale and the total score, and the criterion for judging multiple-choice questions is that the correlation between the questions and the total score should be above .30, which should be statistically significant.

3.7.1.1 Achievement goals scale

(1) Item analysis

According to the item analysis strategies mentioned above, the results of the achievement goal scale are shown in Table 3.4.

Table 3.4 Summary of item analysis of achievement goal scale pretest questionnaire

Item		Distribution	Return	Valid	Effective percentage
Grade	Grade1	80	79	78	98.73%
	Grade2	122	120	111	92.50%
	Grade3	98	94	90	95.74%
Gender	Male	156	156	145	92.95%
	Female	144	144	134	93.06%
Major	Science and engineering	185	180	172	95.56%
	Literature and history	115	113	107	94.69%
Place of origin	Town	71	70	62	88.57%
	Countryside	229	223	217	97.30%
Total		300	293	279	95.22%

Note：N=279; ***p<0.001

As can be seen from the data in Table 3.7.2, there is a big difference between the high and low grouping of each item, and the topic has a high degree of discrimination. The corrected item total correlation is between .556 and .749, both above the standard of .30; factor loadings are between .627 and .900, all above the standard of .30. All 12 items on the achievement goal scale in this study are eligible for retention.

(2) Factor analysis

In this study, the purpose of factor analysis of the questionnaire is to obtain the construct validity of each scale. Validity refers to the correctness of test scores, that is, the extent to which a test can measure the psychological traits it wants to measure. In terms of operation, the options that do not conform to logical conditions after item analysis are deleted, and then exploratory factor analysis is carried out for the remaining questions,

and factor rotation axis is carried out by the varimax.

According to Kaiser (1974), factor analysis can be carried out to determine whether the items are suitable from the sample suitability quantity, that is, the size of the KMO and Bartlett's test results. In the factor analysis part of the achievement goal scale, the value of the KMO sampling suitability test is .761, the chi-square value of the Bartlett's test of sphericity is 1321.806, and the significance level is $p<0.001$, indicating that the scale can be used for factor analysis. By means of the principal axis method, four main factors can be extracted from the 12 measurement questions: Performance-approach goals, performance-avoidance goals, mastery-avoidance goals, and mastery-approach goals, respectively, and each of which contains three items. After the orthogonal rotation, the explained variance of the first factor is 30.62%, the second factor is 20.32%, the third factor is 12.85%, the fourth factor is 9.24%, and the cumulative explained variance is 73.05%, as shown in Table 3.5:

Table 3.5 Summary of factors analysis of the achievement goal scale

Item	Factor1	Factor2	Factor3	Factor4
Performance-approach 1	0.838			
Performance-approach 2	0.863			
Performance-approach 3	0.858			
Performance-avoidance 4			0.852	
Performance-avoidance 5			0.720	
Performance-avoidance 6			0.868	
Mastery-avoidance 7				0.646
Mastery-avoidance 8				0.870
Mastery-avoidance 9				0.858
Mastery-approach 10		0.792		
Mastery-approach 11		0.816		
Mastery-approach 12		0.852		
Eigenvalue	3.675	2.439	1.543	1.110
Explained variance %	30.624	20.322	12.856	9.249
Cumulative explained variance %	30.624	50.946	63.802	73.05

(3) Reliability analysis

Reliability analysis results can help us to determine the reliability of the scale. Cronbach's alpha coefficient is used to verify the internal consistency of various factors to measure the variables. The higher the alpha value, the higher the internal consistency. Wu Minglong (2007) believed that the reliability coefficient should be above .80; if it is between .70 and .80, it is acceptable; but it is also acceptable if it is between .60 and .70.

According to the reliability analysis of achievement goal scale, the Cronbach's alpha reliability coefficient is found to be between .774 and .846. The internal consistency of the total scale is .783, and the reliability coefficients formed by various factors are .846, .785, .774 and .809, which indicates good reliability, as shown in Table 3.6:

Table 3.6 Cronbach's α coefficient of the achievement goal scale and all dimensions

Variable(Dimension)	Item	Cronbach's α
Performance-approach	3	.846
Performance-avoidance	3	.785
Mastery-avoidance	3	.774
Mastery-approach	3	.809
Achievement goal	12	.783

3.7.1.2 Self-efficacy scale

(1) Item analysis

After the item analysis of the self-efficacy scale, as shown in Table 3.7.

Table 3.7 Summary of item analysis of the self-efficacy scale pretest questionnaire

Item	M	SD	Kurtosis	Skew	t-test	Corre-lation	Factor loading	Retain or Not
LA 1	4.03	.831	.193	-.585	-12.264***	.564	.573	R
LA 2	3.30	.861	-.309	.167	-14.350***	.542	.566	R
LA 3	3.26	.928	-.308	-.073	-15.005***	.634	.690	R
LA4	3.34	.914	-.588	-.092	-15.348***	.645	.714	R
LA 5	3.37	.976	-.529	-.109	-13.382***	.502	.572	R
LB 6	3.39	.858	-.176	.005	-11.295***	.423	.498	R
LB 7	3.30	.806	-.081	-.103	-10.198***	.396	.456	R
LB 8	3.68	.987	-.187	-.524	-11.094***	.317	.378	R
LB 9	3.40	.923	-.513	-.025	-12.241***	.441	.558	R
LB 10	2.76	1.026	-.344	.395	-10.739***	.353	.431	R

Note：1. N=279; *** p<0.001 2. LA: Learning Ability; LH: Learning Behavior

As can be seen from the data in Table 3.7, there is a big difference between the high and low grouping of each item, and the topic has a high degree of discrimination.

The corrected item total correlation is between .317 and .645, both above the standard of .30; factor loadings are between .378 and .714, both above the standard of .30. All 10 items on self-efficacy scale in this study are eligible for retention.

(2) Factor analysis

In the factor analysis part of the self-efficacy scale, the KMO sampling suitability test value is .856, the chi-square value of the Bartlett test of sphericity is 646.813, and the significance level is $p<0.001$, indicating that the scale can be used for factor analysis. Since the existing theoretical research of this questionnaire has divided it into two dimensions, the number of factors is directly set as two in the factor analysis. Principal component analysis was used to extract two factors, and the explained variance was 37.107% and 11.260%, respectively; the cumulative explained variance was 48.367%. In the field of social sciences, if the cumulative explained variance of common factors is higher than 50%, the results of factor analysis are acceptable (Wu, 2010), and this result is close to the 50% standard, which places it in the acceptable range.

Table 3.8 Summary of factors analysis of the self-efficacy scale

Dimension	Factor	
	1（Learning ability）	2（Learning behavior）
Learning ability 1	0.790	
Learning ability 2	0.794	
Learning ability 3	0.724	
Learning ability 5	0.492	
Learning behavior 6		0.611
Learning behavior 7		0.712
Learning behavior 8		0.481
Learning behavior 9		0.647
Learning behavior 10		0.568
Learning ability 4	0.611	
Eigenvalue	3.711	1.126
Explained variance %	37.107	11.260
Cumulative explained variance %	37.107	48.367

(3) Reliability analysis

According to the analysis of pre-test items and factor analysis of the questionnaire, the Cronbach's α reliability coefficient total was found to be .804, and the reliability coefficients formed by each factor were .786 and .629, respectively, as shown in Table 3.9.

Table 3.9 Cronbach's α coefficient of overall self-efficacy and each dimension

Variable(Dimension)	Item	Cronbach's α
Learning ability	5	.786
Learning behavior	5	.629
Self-efficacy	10	.804

3.7.1.3 Learning strategy scale

(1) Item analysis

After the item analysis of the learning strategy scale, the results are shown in Table 3.10.

Table 3.10 Summary of item analysis of the learning strategy scale pretest questionnaire

Items	M	SD	Kurtosis	Skew	t-test	Factor Loading	Corre-lation	Retain or Not
Cognitive Strategies1	3.69	.733	-.086	-.272	-12.871***	.674	.614	Retain
Cognitive Strategies2	2.86	.839	-.038	.232	-11.323***	.619	.523	Retain
Cognitive Strategies3	2.97	.852	.090	.336	-11.863***	.684	.588	Retain
Cognitive Strategies4	3.19	.802	-.288	.190	-12.172***	.597	.532	Retain
Cognitive Strategies5	3.27	.926	-.484	.078	-13.978***	.650	.575	Retain
Cognitive Strategies6	3.30	.958	-.678	.099	-13.936***	.624	.559	Retain
Meta-cognitive Strategies7	3.35	.839	-.344	-.075	-14.112***	.684	.639	Retain
Meta-cognitive Strategies8	3.41	.889	-.627	-.042	-14.408***	.704	.662	Retain
Meta-cognitive Strategies9	3.15	.945	-.324	.022	-14.541***	.717	.665	Retain
Meta-cognitive Strategies10	3.26	.909	-.507	-.021	-13.710***	.692	.649	Retain
Meta-cognitive Strategies11	3.27	.941	-.785	-.031	-14.753***	.680	.638	Retain
Meta-cognitive Strategies12	3.22	.943	-.541	-.105	-10.918***	.574	.542	Retain
Resource Management Strategies13	3.32	.946	-.558	-.121	-14.800***	.622	.540	Retain
Resource Management Strategies14	3.5	.929	-.373	-.198	-13.271***	.625	.531	Retain
Resource Management Strategies15	3.73	.927	-.373	-.423	-15.214***	.699	.601	Retain
Resource Management Strategies16	3.72	1.119	-.371	-.594	-12.614***	.583	.489	Retain

Note：N=279; *** p<0.001

As can be seen from the data in Table 3.10, there is a big difference between the high and low grouping of each item, and the topic has a high degree of discrimination. The correlation coefficient between questions and total scores is above than the standard of .30; All problem factors load is above than .30. All 16 items of learning strategy scale in this study are eligible for retention.

(2) Factor analysis

In the factor analysis part of the achievement goal scale, the KMO sampling suitability test value is .916, the chi-square value of the Bartlett test of sphericity is 1672.994, and the significance level is $p<0.001$, indicating that the scale can be used for factor analysis. Since the existing theoretical research of this questionnaire has divided it into three dimensions, the number of factors is directly set as three in the factor analysis. Three factors were extracted by principal component analysis and named as cognitive strategy, meta-cognitive strategy and resource management strategy, which could explain 55.63% of the total variance. The details are shown in Table 3.11.

Table 3.11 Summary of factors analysis of the learning strategy scale

Dimension	Factor		
	1(MS)	2(CS)	3(RS)
CS 1		0.552	
CS 2		0.735	
CS 3		0.776	
CS 4		0.531	
CS 5		0.640	
CS 6		0.565	
MS 7	0.677		
MS 8	0.759		
MS 9	0.743		
MS 10	0.589		
MS 11	0.671		
MS 12	0.629		
RS 13			0.538
RS 14			0.705
RS 15			0.740
RS 16			0.745
Eigenvalue	6.394	1.370	1.138
Explained variance %	39.964	8.562	39.964
Cumulative explained variance %	39.964	48.525	55.639

Note: CS: Cognitive Strategies; MS: Meta-cognitive Strategies RS: Resource Management Strategies

(3) Reliability analysis

According to the analysis of pre-test items and factor analysis of the questionnaire, the Cronbach's alpha reliability coefficient total was found to be .890, and

the reliability coefficients formed by each factor were .805, .841 and .741, respectively. As shown in Table 3.12.

Table 3.12 Cronbach's α coefficient of overall learning strategy and each dimension

Variable(Dimension)	Item	Cronbach's α
Cognitive Strategies	6	.805
Meta-cognitive Strategies	6	.841
Resource Management Strategies	4	.741
Learning Strategies	16	.890

3.7.2 Formal questionnaire statistical analysis

3.7.2.1 Sample basic information

A total of 1,000 questionnaires were issued and 951 were returned, with a return rate of 95.1%. Of those returned, 873 questionnaires, or 91.8%, were used in the analysis. The return rate of formal samples is shown in Table 3.13, and the background information of formal samples is shown in Table 3.14.

Table 3.13 The distribution and return rate of formal samples

School code	Distribution	Return	Effective Percentage
YC	350	350	342 (97.7%)
BH	370	354	297 (83.8%)
NS	280	246	234 (95.1%)
Total	1000	951	873 (91.8%)

Table 3.14 The background information of formal samples

Item		Actual return	Frequency(%)
Grade	Grade1	354	40.55%
	Grade2	302	34.59%
	Grade3	217	24.86%
Gender	Male	302	34.59%
	Female	553	63.34%
Major	Science and Engineering	409	46.85%
	Literature and History	464	53.15%
Place of origin	Town	216	24.74%
	Countryside	657	75.26%
Total		873	

3.7.2.2 Normality test

The data in this study were tested from two angles: univariate normality and multivariate normality.

(1) Univariate normality test

Curran, West, and Finch (1996) suggested an absolute value of the skewness coefficient under 2 and an absolute value of the kurtosis coefficient under 7 as the criteria for judging the normality of the data; that is, when the absolute value of the skewness coefficient is under 2 and the absolute value of the kurtosis coefficient is under 7, the data can be considered normal.

① Achievement goals

Empirical factor analysis showed that the skewness and kurtosis absolute values of all observation variables on achievement goal scale were under 2, with skewness values between -.788 to .002, and the kurtosis values between -.679 to .322. The details are as follows in Table 3.15.

Table 3.15 Summary of the results of the achievement goal test

Variable	Item	Min	Max	Skew	Kurtosis
Mastery-approach	12	1	7	-.599	.107
Mastery-approach	11	1	7	-.788	.162
Mastery-approach	10	2	7	-.350	-.679
Mastery-avoidance	9	1	7	-.412	-.153
Mastery-avoidance	8	1	7	-.432	.290
Mastery-avoidance	7	1	7	-.410	.238
Performance-avoidance	6	1	7	-.162	-.588
Performance-avoidance	5	1	7	-.118	-.599
Performance-avoidance	4	1	7	.002	-.665
Performance-approach	3	1	7	-.682	.322
Performance-approach	2	1	7	-.240	-.030
Performance-approach	1	1	7	-.449	-.035
Multivariate					43.889

② Self-efficacy

Empirical factor analysis showed that the skewness and kurtosis absolute values of all observation variables on self-efficacy scale were under 2, with skewness values between -.554 to .299, and kurtosis values between -.469 to .278. The details are as follows in Table 3.16.

Table 3.16 Summary of the results of the sele-efficacy test

Variable	Item	Min	Max	Skew	Kurtosis
Learning behaviour	10	1	5	.299	-.469
Learning behaviour	9	1	5	-.144	-.311
Learning behaviour	8	1	5	-.480	-.175
Learning behaviour	7	1	5	-.012	-.243
Learning behaviour	6	1	5	-.068	-.157
Learning ability	5	1	5	-.072	-.573
Learning ability	4	1	5	-.027	-.388
Learning ability	3	1	5	-.050	-.241
Learning ability	2	1	5	.029	-.238
Learning ability	1	1	5	-.554	.278
Multivariate					25.074

③ Learning strategies

Empirical factor analysis showed that the skewness and kurtosis absolute values of all observation variables on learning strategies scale were under 2, with skewness values between -.690 to .195, and kurtosis values between -.558 to .934. The details are as follows in 3.17.

Table 3.17 Summary of the results of learning strategies test

Variable	Item	Min	Max	Skew	Kurtosis
Resource management strategies	16	1	5	-.690	-.124
Resource management strategies	15	1	5	-.576	.015
Resource management strategies	14	1	5	-.238	-.383
Resource management strategies	13	1	5	-.192	-.330
Meta-cognitive strategies	12	1	5	-.179	-.443
Meta-cognitive strategies	11	1	5	-.152	-.448
Meta-cognitive strategies	10	1	5	-.167	-.381
Meta-cognitive strategies	9	1	5	-.048	-.415
Meta-cognitive strategies	8	1	5	-.156	-.375
Meta-cognitive strategies	7	1	5	-.170	-.308
Cognitive strategies	6	1	5	-.102	-.558
Cognitive strategies	5	1	5	.004	-.483
Cognitive strategies	4	1	5	.008	-.343
Cognitive strategies	3	1	5	.195	-.175
Cognitive strategies	2	1	5	.055	-.164
Cognitive strategies	1	1	5	-.636	.934
Multivariate					72.476

In conclusion, the observed variables were univariately normal.

(2) Multivariate normality test

The Mardia coefficient, i.e., the coefficient of the multivariate skewness and kurtosis coefficients, was used to test whether the variables in this study had multivariate normality. Multivariate normality means that every variable in the sample has univariate normality and bivariate normal distribution between two variables (Hayduk, 1987). Raykov and Marcoulides (2008) suggested comparing the Mardia coefficient with p(p+2), and Bollen (1989) proposed that when the Mardia coefficient is under p(p+2), it can be confirmed that the sample has multivariate normality.

As can be seen from the Mardia coefficients of the Table 3.15, 3.16, and 3.17

models above, the Mardia coefficient of achievement goal model is 43.899, and the p(p+2) is 168; the Mardia coefficient of self-efficacy model is 25.074, and the p(p+2) is 120; and the Mardia coefficient of learning strategy model is 72.476, and the p(p+2) is 288, In all cases, the p(p+2) value is significantly higher than the Mardia coefficient. Therefore, it can be confirmed that the model also has multivariate normality.

Based on the normality analysis shown above, all observed variables in this study conform to the normality and multivariate normality of univariate variables, so the most probable likelihood estimation method can be used for various parameter estimations and adaptation verification of the model.

3.7.2.3 Model fit

(1) Model fit test

There are many indicators for fitness measurement. Hair, Anderson, Tathan and Black (1998) divided them into three types: The absolute fitness easure index, incremental fitness index, and parsimonious goodness-fit-index (PGFI).

Whether the conceptual model can fit into the observed data is first determined by the chi-square value. It is generally believed that when the significance (*p*) is greater than .05, the model and data are considered moderately good, whereas when the significance is under .05, the model and data are considered moderately bad. Because the chi-square test itself is vulnerable to the influence of sample size, Bagozzi and Yi (1988) argue that we should not only refer to the chi-square values, but also consider the size of the sample; therefore, it is recommended to use the chi-square value and the ratio of degrees of freedom (i.e., normed chi-square) to replace the chi-square values to test a

model with a moderate value. It is also suggested that the appropriate ratio is between 1-5, and the best is under 3. In addition, the AGFI and GFI should be greater than .90 (Henry & Stone, 1994) and the RMR and SRMR should be under .08 (Hu & Eentler, 1999). McDonald and Ho (2002) recommend a RMSEA below .05. Hair, Anderson, Tatham and Black (1998) believe that the NFI, IFI, and CFI should be higher than .90, the PGFI should be greater than .05, the CN should be greater than 200, and so on.

Through the report output of AMOS, the overall adaptability of the three scale models in this study is as follows:

Table 3.18 The overall model fit index of achievement goal

Item		Standard values	Result data		Mode fit
Absolute fitness easure index	χ^2/df	<5	3.193	<5	Fit
	GFI	>.90	.971	>.90	Fit
	AGFI	>.90	.952	>.90	Fit
	RMR	<.08	.074	<.08	Fit
	RMSEA	<.08	.050	<.08	Fit
Incremental fitness index	NFI	>.90	.961	>.90	Fit
	CFI	>.90	.973	>.90	Fit
	RFI	>.90	.947	>.90	Fit
	IFI	>.90	.973	>.90	Fit
Parsimonious goodness-fit-index	PNFI	>.50	.699	>.50	Fit
	PGFI	>.50	.597	>.50	Fit
	CN	>200	371	>200	Fit

Table 3.19 The overall model fit index of self-efficacy

Item		Standard values	Result data		Mode fit
Absolute fitness easure index	χ^2/df	<5	3.913	<5	Fit
	GFI	>.90	.970	>.90	Fit
	AGFI	>.90	.952	>.90	Fit
	RMR	<.08	.035	<.08	Fit
	RMSEA	<.08	.058	<.08	Fit
Incremental fitness index	NFI	>.90	.930	>.90	Fit
	CFI	>.90	.947	>.90	Fit
	RFI	>.90	.907	>.90	Fit
	IFI	>.90	.929	>.90	Fit
Parsimonious goodness-fit-index	PNFI	>.50	.703	>.50	Fit
	PGFI	>.50	.600	>.50	Fit
	CN	>200	319	>200	Fit

1Table 3.20 The overall model fit index of learning strategy

Item		Standard values	Result data		Mode fit
Absolute fitness easure index	χ^2/df	<5	4.524	<5	Fit
	GFI	>.90	.934	>.90	Fit
	AGFI	>.90	.911	>.90	Fit
	RMR	<.08	.039	<.08	Fit
	RMSEA	<.08	.064	<.08	Fit
Incremental fitness index	NFI	>.90	.911	>.90	Fit
	CFI	>.90	.929	>.90	Fit
	RFI	>.90	.894	<.90	Close
	IFI	>.90	.929	>.90	Fit
Parsimonious goodness-fit-index	PNFI	>.50	.767	>.50	Fit
	PGFI	>.50	.693	>.50	Fit
	CN	>200	240	>200	Fit

In the three variable models shown above, the value of χ^2/df replaces the value of chi-square. Although the χ^2/df value of the three variable models is greater than 3, it can be regarded as consistent when the recommended value is between 1 and 5. The other indicators of achievement goal and self-efficacy models all meet the requirements. The

learning strategy's RFI is .894, which is under .90 and is close to the compliance index. Therefore, the overall fitness of the three variable models is good.

(2) Convergent validity

According to the criterion of convergence validity that needs to be satisfied, that is, that the standardized regression weights must be greater than .50, which is significant at the time of the t-test (Hair et al.1998; Hulland, 1999), the Composite Reliability (CR) must be greater than 0.6 (Fornell & Larcker, 1981; Bagozzi & Yi, 1988) and the average variance extracted (AVE) of each potential variable must be greater than 0.5. Through the report output of AMOS, the convergent validity of each variable is as follows:

Table 3.21 Convergent validity of the achievement goal

Dimension	Item	Estimate	CR	AVE
Performance-approach	1	.717	.564	.550
	2	.800		
	3	.812		
Performance-avoidance	4	.685	.594	.577
	5	.638		
	6	.887		
Mastery- avoidance	7	.741	.674	.641
	8	.823		
	9	.644		
Mastery-approach	10	.794	.761	.784
	11	.774		
	12	.793		

Table 3.22 Convergent validity of the self-efficacy

Dimension	Item	Estimate	CR	AVE
Learning Ability	1	.478	.709	.577
	2	.667		
	3	.717		
	4	.711		
	5	.552		
Learned Behavior	6	.658	.666	.541
	7	.584		
	8	.400		
	9	.597		
	10	.415		

Table 3.23 Convergent validity of the learning strategy

Dimension	Item	Estimate	CR	AVE
Cognitive strategies	1	.663	.727	.590
	2	.649		
	3	.697		
	4	.676		
	5	.638		
	6	.580		
Meta-cognitive strategies	7	.654	.825	.697
	8	.693		
	9	.737		
	10	.719		
	11	.678		
	12	.576		
Resource management strategies	13	.665	.736	.643
	14	.674		
	15	.685		
	16	.536		

In the convergent validity report of the three variable models shown above, the standardized regression weights of achievement goals are greater than .50, between .638 and .887, which is significant on the t-test, and the CR is between .564 and .761. Although the CR of the two dimensions does not reach to .60, it is close to it, which indicates that the CR of two dimensions, i.e., performance-approach and performance -avoidance, is not adequate.

There may be some questions about the design items that have not been considered, and it is expected that this research will be expanded in the future. Meanwhile, the AVE of the four first-order dimensions of this variable has values between .550 and .784, all of which are greater than .50, indicating that the convergent validity of the whole variable is acceptable. The standardized regression weights of self-efficacy ranged from .400 to .717, and three failed to reach .50. However, according to the suggestion of Hair et al. (1992), a value greater than .40 is acceptable and significant on t-test. The CR of the two first-order dimensions is .666 and .709, both of which are greater than .60, and the AVE of the two first-order dimensions is between .541 and .577, respectively, both of which are greater than .50. The standardized regression weights of learning strategy are between .535 and .737, are all greater than .50, and are significant on the t-test. The CR of the third-order dimensions is greater than .60, with values between .727 and .825, and the AVE of the third-order dimensions is greater than .50, with values between .590 and .687. Therefore, it can be inferred that all variables have convergent validity.

(3) Discriminant validity

In terms of the discriminant validity test, the AVE of each dimension is larger than the square of dimension correlation coefficient (Fornell & Larcker,1981). Meanwhile, according to the suggestion of Hair et al. (1998), the AVE square root of each dimension is larger than the number of correlation coefficients of each dimension, which must account for at least 75% of the total number. The discriminant validity test of each variable is as follows:

Table 3.24 Discriminant validity of each variable

Dimension	Number of items	A	B	C	D	E	F	G	H	I
A	3	.550								
B	3	.054	.577							
C	3	.165**	.294**	.641						
D	3	.468**	-.012	.335**	.784					
E	5	.368**	-.086*	.025	.357**	.577				
F	5	.245**	-.029	.070*	.278**	.510**	.541			
G	6	.202**	-.053	.082*	.296**	.382**	.426**	.590		
H	6	.275**	-.014	.126**	.364**	.387**	.419**	.624**	.697	
I	4	.263**	-.058	.070*	.369**	.321**	.257**	.545**	.604**	.643
Academic performance		.123**	-.093**	.053	.145**	.148**	.104**	.199**	.208**	.173**

Notes: 1. A: performance-approach, B: performance-avoidance, C: mastery-avoidance, D: mastery-approach, E: learning ability, F: learned behavior, G: cognitive strategies, H: meta-cognitive strategies, I: resource management strategies

2. The mean value of the variable was taken as the sum mean value of all items in each dimension of the scale.

3. The diagonal value, which is the square root of the average variance extracted (AVE) of a potential variable, should be greater than the off-diagonal value.

4. *The correlation coefficient between variables reached the significant level at significance level a =0.05

As shown on Table 3.24, the AVE square root of cognitive strategy is less than the correlation coefficient between dimensions, and only accounts for about 10% of the total number, which conforms to the judgment criterion recommended by Hair et al. (1998). Therefore, the scales have discriminant validity.

CHAPTER 4

RESULTS

In this chapter, the results analysis and discussion are conducted in combination with a discussion of the literature, questionnaire survey and other methods to collect data (based on the research objective and hypothesis as well as the results of the formal sample of the subjects on the questionnaire regarding achievement goals, and self-efficacy and learning strategies). Section one examines the differences in achievement goals, self-efficacy, learning strategies, and academic performance of students at private universities in Shandong Province; Section two examines the analysis of the effects of achievement goals, self-efficacy and learning strategies on the academic performance of the students; Section three consists of the analysis of the mediating effect of self-efficacy and learning strategies in the relationship between achievement goals and academic performance of the students.

4.1 The differences in achievement goals, self-efficacy, learning strategies and academic performanceac among students at private universities in Shandong Province

This section is mainly based on the statistical analysis results of subjects' valid questionnaire responses and basic data. Using this data, we will explore the differences of various background variables on private university students in Shandong Province in

terms of achievement goals, self-efficacy, learning strategies and academic performance. Tirst, the statistical analysis of each variable and related level (including the mean, standard deviation, etc.) is carried out. After that, the independent-samples t-test is used to analyze the differences in gender, major and the place of origin of students, and the One-way ANOVA statistical data of grade level are processed. If the One-way ANOVA reaches a significant level, the Scheffe method is used for the after-the-fact comparison. This is done to test whether subjects with different background variables show significant differences in each variable in this research.

4.1.1 Analysis of the differences among students from different backgrounds in terms of achievement goals

4.1.1.1 Analysis of achievement goals of subjects

In this study of achievement goals, the scores given on seven-point scale, that includes four dimensions-performance-approach goals, performance-avoidance goals, mastery-avoidance goals, and mastery-approach goals. Statistical analysis results show that the mean value of achievement goals scale is 4.981, showing that the subjects are inclined to “kind of agree”, and indicating that the subjects have a higher degree of perception achievement goals; the standard deviation of the total scale is .723, indicating that the overall difference in achievement goals reported by subjects is not significant. On all levels, the mean value of approach to the goal is 5.671, the highest, which indicates strong agreement on the scale and shows that students have a clear goal for their own growth and development and consider the pursuit of personal growth their main goal. The second highest is the performance-approach goal, with a mean value of 5.386,

indicating that students also pay more attention to academic performance during the study period, which is also a behavior that is necessary for students. Moreover, in terms of the mastery-avoidance goal and performance-avoidance goal, the mean value went down successively, which indicates that the tested students maintain a neutral attitude towards the goal of avoiding being the worst, that is, the subjects have a more lax approach to avoiding this outcome. As for standard deviation, the performance-avoidance goal and mastery-avoidance goal are relatively high, which means that the subjects may show some differences in respect to this aspect of performance. The specific statistical results of the data are shown in Table 4.1:

Table 4.1 Descriptive statistics of achievement goals of subjects (N=873)

Item	M	SD
Achievement goal	4.981	0.723
Performance-approach	5.386	1.068
Performance-avoidance	4.045	1.364
Mastery-avoidance	4.823	1.122
Mastery-approach	5.671	0.981

4.1.1.2 Analysis of differences in achievement goals of students by gender

According to the Independent-samples *t*-test, there is no significant difference between students of different genders in respect to performance-approach goal, performance-avoidance goal, mastery-avoidance goal, or mastery-approach goal. In terms of overall achievement goals, there is no significant difference between students of different genders (p=.298); in terms of the performance-approach goal, no significant difference between students of different genders is shown (p=.061); no significant

difference between students of different genders is shown in terms of the performance-avoidance goal (p=.529); no significant difference between students of different genders is shown in terms of the mastery-avoidance goal (p=.651); and no significant difference between students of different genders is shown in terms of the mastery-approach goal (p=.714). The specific statistical results of the data are shown in Table 4.2:

Table 4.2 Differences in achievement goals of students by gender

	M(SD)		df	*t*	*p*
	Male(N=320)	Female(N=553)			
Achievement goal	5.01(.750)	4.96(.710)	871	1.04	0.298
Performance-approach	5.47(1.07)	5.33(1.05)	871	1.87	0.061
Performance-avoidance	4.08(1.41)	4.02(1.33)	871	.631	0.529
Mastery-avoidance	4.84(1.19)	4.81(1.07)	871	.453	0.651
Mastery-approach	5.65(.950)	5.68(.990)	871	-.367	0.741

4.1.1.3 Analysis of the differences in achievement goals by major

As the results have shown in Table 4.3, there are significant differences among students of different majors in achievement goals and some dimensions, while others show no significant differences.

In terms of overall achievement goal, t(871)=2.593, p=.009, students of science and engineering (M=5.04, SD=.75) score higher than students of literature and history (M=4.92, SD=.69), showing a significant difference; there are significant differences in performance-approach goals, t(871)=2.702, p=.007, between students of science and engineering (M=5.48, SD=1.07) and students of literature and history

(M=5.29, SD=1.05), showing a significant difference and higher scores among the former; and in terms of performance-avoidance goal, *t*(871)=2.007, *P*=.044, students of science and engineering (M=4.14, SD=1.43) score higher than students of literature and history (M=3.95, SD=1.28), showing a significant difference. However, no significant difference is shown with respect to the mastery-avoidance goal and the mastery-approach goal.

Table 4.3 Differences in the achievement goals of students by major

	M(SD)		df	*t*	*p*
	Science and technology (*N*=409)	Literature and history (*N*=464)			
Achievement goal	5.04(.750)	4.92(.69)	871	2.593	0.009
Performance-approach	5.48(1.07)	5.29(1.05)	871	2.702	0.007
Performance-avoidance	4.14(1.43)	3.95(1.28)	871	2.007	0.044
Mastery-avoidance	4.83(1.21)	4.81(1.03)	871	0.220	0.826
Mastery-approach	5.73(1.01)	5.61(.95)	871	1.669	0.095

4.1.1.4 Analysis of differences in achievement goals between students by place of origin

According to the independent-samples t-test, whose analysis results are shown in Table 4.4, students from different places show significant differences in the dimension of the mastery-approach goal *t*(871)=-2.981, *p*=.003, and the mastery-approach goal of students from towns (M=5.49, SD=.99) is lower than that of students from countryside (M=5.72, SD=.97). And no significant difference is shown in other dimensions.

Table 4.4 Differences in achievement goals between students by place of origin

	M(SD)		df	*t*	*p*
	Town(*N*=216)	Countryside (*N*=657)			
Achievement goal	4.91(.73)	5.00(.71)	871	-1.509	0.132
Performance-approach	5.33(1.12)	5.40(1.04)	871	-0.763	0.446
Performance-avoidance	4.09(1.32)	4.02(1.37)	871	0.629	0.530
Mastery-avoidance	4.73(1.12)	4.85(1.11)	871	-1.293	0.196
Mastery-approach	5.49(.99)	5.72(.97)	871	-2.981	0.003

4.1.1.5 Analysis of differences in achievement goals between students by grade level

One-way ANOVA was used to analyze the differences in achievement goals among students various grade levels. As shown in Table 4.5, there is no significant difference in achievement goals between students of different grade levels, F(2,870)=.199, *p*=.820.

Table 4.5 Differences in achievement goals of students by grade level

Source	*SS*	*df*	*MS*	*F*	*p*
Grade level	0.208	2	0.104	0.199	0.820
Error	455.427	870	0.523		
Total	455.635	872			

It can be seen from the test results above that there is no significant gender difference in achievement goals or their related dimensions in this study, which is at odds with he results of some other studies. For instance, Zhu (2012), Wang (2013), and Zhang (2019) deemed that female students' mastery goals and performance-approach goals are higher than those of male students; however, Zhang, Hou, Yang and Sun (2017) took 800

college students from Hunan Agricultural University as their subjects, and it was found that female students were more likely than male students to set performance goals and male students were more likely than female students to set mastery goals. In terms of the place of origin of students, this study find that students from urban areas have lower mastery-approach goals than those from rural areas, which is consistent with the study of Zhu (2012).

4.1.2 The difference test of self-efficacy of students from different backgrounds

4.1.2.1 Analysis of self-efficacy of subjects

The academic self-efficacy scale in this study includes two dimensions: Learning ability and learning behavior. It is scored according to a five-point scale, and the higher the score, the higher the self-efficacy, as shown in Table 4.6:

Table 4.6 Descriptive statistics of self-efficacy of subjects (N=873)

Item	M	SD
Self-efficacy	3.422	0.537
Learning ability	3.504	0.637
Learning behavior	3.341	0.599

According to the table above, the mean value of the self-efficacy scale is 3.422, indicating how close the subjects are to “kind of consistent” and indicating that the self-efficacy perception of the subjects is high; the standard deviation of the total scale is .537, indicating that the overall difference in self-efficacyshown by subjects is not significant. In terms of dimensions, the mean value of learning ability is 3.504, the highest score, indicating that students have strong learning ability; the mean value of learning behavior is 3.341, which is also relatively high, but compared with learning

ability, it indicates that students are still lacking in behaviors conducive to learning. Seen from the perspective of standard deviation, the values were all under 1, indicating that there is little difference in the self-efficacy of subjects.

4.1.2.2 Analysis of differences in self-efficacy by gender

The independent-samples t-test was adopted to analyze whether students of different genders showed differences in self-efficacy, and the results are shown in Table 4.7. There is no significant difference in the self-efficacy of students of different genders. In terms of self-efficacy, $t(871)=1.354$, $p=.176$, male students (M=3.45, SD=.57), female students (M=3.40, SD=.51), $t(871)=1.712$, $p=.087$, male students (M=3.55, SD=.69), female students (M=3.47, SD=.60); and in terms of learning behavior, $t(871)=.608$, $p=.544$, male students (M=3.35,SD=.62) and female students (M=3.33,SD=.58), which show no significant difference.

Table 4.7 Differences in self-efficacy of students by gender

	M(SD)		df	*t*	*p*
	Male(*N*=320)	Female(*N*=553)			
Self-efficacy	3.45(.57)	3.40(.51)	871	1.354	0.176
Learning ability	3.55(.69)	3.47(.60)	871	1.712	0.087
Learning behavior	3.35(.62)	3.33(.58)	871	0.608	0.544

4.1.2.3 Analysis of differences in self-efficacy between students of different majors

The independent - samples t-test was adopted to analyze whether students of different majors show differences in self-efficacy. The results are shown inTable 4.8.

Students from different majors show no significant differences in their overall self-efficacy or learning behaviors. However, in terms of learning ability, there are differences between students of science and engineering and students of literature and history.

In terms of self-efficacy, $t(871)=1.498$, p=.134, and students of science and engineering (M=3.45, SD=.56) and those of literature and history (M=3.39, SD=.50), there are no significant differences. In terms of learning ability, $t(871)=2.059$, $p=.038$, students of science and engineering (M=3.55, SD=.67) possess higher learning abilities than students of literature and history (M=3.46, SD=.59), with significant differences between the two groups. In terms of learning behavior, $t(871)=.483$, p=.629, students of science and engineering (M=3.35, SD=.62) and students of literature and history (M=3.33, SD=.57) are not significantly different.

Table 4.8 Differences in self-efficacy of students of different majors

	M(SD)		df	*t*	*p*
	Science and technology (*N*=409)	Literature and history (*N*=464)			
Self-efficacy	3.45(.56)	3.39(.50)	871	1.498	0.134
Learning ability	3.55(.67)	3.46(.59)	871	2.059	0.038
Learning behavior	3.35(.62)	3.33(.57)	871	0.483	0.629

4.1.2.4 Analysis of differences in self-efficacy between students from different places of origin

The independent-samples t-test was adopted to analyze whether students from different places show in self-efficacy. The results are shown in Table 4.9. There are no

significant differences in self-efficacy and its dimensions among different students, that is, there is no significant difference in self-efficacy between urban students and rural students.

Table 4.9 Differences in self-efficacy between students from different places of origin

	M(SD)		df	*t*	*p*
	Town(*N*=216)	Countryside (*N*=657)			
Self-efficacy	3.39(.55)	3.43(.53)	871	-0.981	0.327
Learning ability	3.49(.65)	3.50(.63)	871	-0.229	0.819
Learning behavior	3.28(.61)	3.35(.59)	871	-1.517	0.130

4.1.2.5 Analysis of differences in self-efficacy among students in different grade levels

One-way ANOVA testing was used to analyze the differences in self-efficacy among various grade levels, and the results are shown in Table 4.10. The results show that there is no significant difference in self-efficacy among students of different grade levels.

Table 4.10 Differences in self-efficacy among students of different grade levels

Source	*SS*	*df*	*MS*	*F*	*p*
Grade level	1.613	2	0.806	2.803	0.061
Error	250.262	870	0.288		
Total	251.874	872			

According to the test results shown above, there is no significant difference in self-efficacy due to gender, the students' place of origin, or their grade level, and there are some major-related differences only terms of in learning abilities, with students of

science and engineering demonstrating higher learning abilities than students of literature and history. This is consistent with the conclusion reached by Yong (2010) in his self-efficacy research on preparatory students studying at private universities in Malaysia – there is no significant difference in self-efficacy among the subjects in terms of group, gender, or age. The research results show that the self-efficacy of various groups of students tends to show more similarities than differences. However, some study results conflict with this finding, and Eccles (2002) pointed out that there is a significant relationship between gender and learning self-efficacy. For instance, the higher self-efficacy of male college students is mainly embodied in those who are students of science and engineering. Guo (2016) (who took college students as subjects) also found that there were gender-related differences in self-efficacy. However, the conclusion of this study is consistent with that of Wang (2013), that is to say, there is a significant difference between college students of different majors related to their sense of self-efficacy in terms of learning ability and their total scores of academic self-efficacy. Hence, there are many inconsistencies in the analysis of the background variables of self-efficacy in college studentsthat may be related to the research objectives or research methods and should be discussed further.

4.1.3 The difference test of learning strategies and academic performance of students from different backgrounds

4.1.3.1 Analysis of learning strategies of subjects

The learning strategy scale of this study contains three dimensions: cognitive strategy, meta-cognitive strategy and resource management strategy, and it is scored

according to a five-point scale. The statistical analysis is shown in Table 4.11:

Table 4.11 Descriptive statistics of learning strategies of subjects (N=873)

Item	M	SD
Learning strategies	3.418	0.576
Cognitive strategy	3.292	0.636
Meta-cognitive strategy	3.388	0.678
Resource management strategy	3.652	0.721

According to the above table, the mean value of the learning strategy scale is 3.418, indicating that the subjects are close to “it is sometimes this way”, and indicating that the subjects shown certain learning strategies, and the standard deviation of the total scale is .576, indicating that there is minor difference in the overall learning strategies presented by the subjects. In terms of dimensions, the mean value of resource management strategies is 3.652, the highest score, indicating that the tested students are good at time management and utilization of various resources, which also reflects the characteristics of university study. The mean value of meta-cognitive strategies is 3.341, and that of cognitive strategies is 3.292. In terms the perspective of standard deviation, all of them are under 1, indicating that there is little difference in the learning strategies of subjects.

4.1.3.2 Analysis of differences in learning trategies and academic performance among students by gender

The independent-samples t-test was adopted to figure out whether students of different genders show differences in learning strategies and academic performance . The results are shown in Table 4.12. There is no significant difference in learning strategies

between students of different genders. But in terms of academic performance, there is a significant difference between boys and girls, $t(871)=-8.145$, $p=.000$, male students (M=51.24,SD=4.04) performed less successful than female students (M=53.44,SD=3.48).

Table 4.12 Differences in learning strategies and academic performance of students by genders

	M(SD)		df	*t*	*p*
	Male(*N*=320)	Female(*N*=553)			
Learning strategies	3.42(.57)	3.42(.56)	871	0.004	0.997
Cognitive strategy	4.12(.51)	4.11(.50)	871	0.318	0.750
Meta-cognitive strategy	3.43(.64)	3.40(.65)	871	0.655	0.512
Resource management strategy	3.63(.73)	3.66(4.04)	871	-0.438	0.661
Academic performance	51.24(4.04)	53.44(3.48)	871	-8.145	0.000

4.1.3.3 Analysis of differences in learning strategies and academic performance between students of different majors.

The independent-samples t-test was adopted to figure out whether students of different majors show differences in learning strategies and academic performance. The results are shown in Table 4.13. There is no significant difference in learning strategies between students from different majors. However, there is significant difference in academic performance between majors, and the academic performance of science and engineering students (M=52.25, SD=4.13) is lower than that of students majoring in literature and history (M=52.96, SD=3.53).

Table 4.13 Differences in learning strategies and academic performance by majors

	M(SD)		df	*t*	*p*
	Science and technology (*N*=409)	Literature and history (*N*=464)			
Learning strategies	3.47(.58)	3.38(.55)	871	2.347	0.019
Cognitive strategy	4.15(.52)	4.09(.49)	871	1.75	0.08
Meta-cognitive strategy	3.46(.66)	3.36(.62)	871	2.468	0.014
Resource management strategy	3.68(.73)	3.62(.70)	871	1.359	0.175
Academic performance	52.25(4.13)	52.96(3.53)	871	-2.707	0.006

4.1.3.4 Analysis of differences in learning strategies and academic performance between students by places of origin

The independent-samples t-test was adopted to figure out whether students from different places show differences in learning strategies and academic performance. The results are shown in Table 4.14. There are no significant differences in learning strategies and academic performance between students by places of origin

Table 4.14 Differences in learning strategies and academic performance between students by place of origin

	M(SD)		df	*t*	*p*
	Town(*N*=216)	Countryside (*N*=657)			
Learning strategies	3.38(.55)	3.43(.57)	871	-1.111	0.267
Cognitive strategy	4.04(.53)	4.14(.50)	871	-2.477	0.013
Meta-cognitive strategy	3.36(.62)	3.42(.65)	871	-1.308	0.191
Resource management strategy	3.60(.70)	3.66(.72)	871	-1.186	0.236
Academic performance	52.45(3.93)	52.69(3.81)	871	-0.774	0.439

4.1.3.5 Analysis of differences in learning strategies and academic performance among students by grade levels

One-way ANOVA testing was adopted to analyze the differences in learning strategies among students of different grade levels. The results are shown in Table 4.15. There is no significant difference in learning strategies among students of different grade levels, F(2,870)=2.184, *p*=.113.

Table 4.15 Differences in learning strategies among students by grade levels

Source	*SS*	*df*	*MS*	*F*	*p*
Grade level	1.415	2	0.708	2.184	0.113
Error	281.963	870	0.324		
Total	283.378	872			

According to ANOVA, there are differences in academic performance among students of different grade levels, as is shown in Table 4.16. F(2,870)=6.806, *p*=.001. The Scheffe afterward comparison shows that first-year students (M = 53.19, SD = 3.78) and

the sophomore (M = 52.39, SD = 3.73) show difference (*p* =. 021): the academic performance of first-year students is better than that of second-year students. The academic performance of first-year students (M=53.19, SD=3.78) is better than that of third-year students (M=52.63, SD=3.84), *p*=.002. However, there is no difference between sophomore (M=52.39, SD=3.73) and junior (M=52.63, SD=3.84), *p*=.588.

Table 4.16 Differences in academic performance among students by grade levels

Source	*SS*	*df*	*MS*	*F*	*p*
Grade level	98.675	2	99.337	6.806	0.001
Error	12697.358	870	14.595		
Total	122896.033	872			

To sum up, there is no significant difference in learning strategies due to gender, major, the place of origin, or their grade levels. However, in terms of academic performance, female students are higher than male students, literature and history students are higher than science and engineering students, and the academic performance of first-year students is higher than that of second-year and third-year students. Comparing with existing studies, Zhao et al. (2005) and Zhou et al. (2014) found significant differences in the learning strategies of college students in gender, grade level and major, which was inconsistent with the results of this study. This should be difference from the test objects. Although they are both college students, private university students have their own particularity and their learning characteristics are different from those of public university students. Therefore, there should be discussed further and in-depth.

4.2 Analysis of the effects of achievement goals, self-efficacy, and learning strategies on the academic performance of students at private universities in Shandong Province

To investigate the influence of achievement goals, self-efficacy and learning strategies on the academic performance of the subjects of this study, the statistical method of product-moment correlation was used first to explore the correlation between achievement goals and academic performance, self-efficacy and academic performance, and learning strategies and academic performance.

4.2.1 Correlation analysis of achievement goals, self-efficacy, learning strategies and academic performance of students at private universities in Shandong Province

4.2.1.1 Correlation analysis of achievement goals and academic performance of students at private universities in Shandong Province

According to the results of the Person correlation test, there is a significant positive correlation [r(873)= .071, p=.035] between achievement goals and students' academic performance. Between the dimensions and academic performance, mastery-avoidance goals have nothing to do with academic performance. There is significant positive correlation between performance approach goal and mastery approach goal and students' academic achievement [r(873)=.123, p<.001], [r(873)= .145, p<.001], while there is significant negative correlation between performance avoidance goal and students' academic achievement [r(873)= -.093, p<.001]. This means that the higher the cognition degree of students' performance and the mastery-approach goal, the better their academic performance will be. On the other hand, the higher the degree of the

performance-avoidance goal, theworse their academic performance will be.

This result is consistent with the research conclusions of Elliot and McGreot (2001) showing, for example, that the performance-approach goal is significantly correlated with students' academic performance; however, they believed that the performance of students with the mastery-approach goal may not show a direct correlation with their exam performance although they use in-depth processing to learn (2001). However, Jiang and Liu (2006) and Bong (2009) believed that mastery-approach goals were significantly correlated with students' academic performance, while performance-avoidance goals were negatively correlated with it, which is consistent with the results of this study. The specific correlation analysis results are summarized in Table 4.17:

Table 4.17 Summary of the correlation coefficient between achievement goals and academic performance

	1	2	3	4	5
Achievement goal1	—				
Performance-approach2	.618***	—			
Performance-avoidance3	.602***	.054	—		
Mastery-avoidance4	.701***	.165***	.294***	—	
Mastery- approach5	.636***	.468***	-.012	.335***	—
Academic Performance6	.071*	.123***	-.093**	.053	.145***

Note：N=873; *p＜.05, **p＜.01, ***p＜.001

4.2.1.2 Relevant verification of academic self-efficacy and academic performance of students at private universities in Shandong Province

According to the Pearson correlation test results, students' academic self-efficacy, including learning ability and learning behavior, has a significant positive correlation with their academic performance. The results are essentially consistent with previous research conclusions; that is, students' self-efficacy is significantly correlated with their academic performance and has a positive impact on it (Bandura, 1977, 1986; Schunk, 1983; Komarraju & Nadler, 2013). This indicates that the higher students' academic self-efficacy, the better their academic performance will be. The details are shown in Table 4.18.

Table 4.18 Summary of correlation coefficients between self-efficacy and academic performance

	1	2	3	4
Self-efficacy1	—			
Learning ability2	.877***	—		
Learning behavior3	.860***	.510***	—	
Academic **p**erformance4	.146***	.148***	.104**	—

Note：N=873; **p＜.001, ***p＜.001

4.2.1.3 Relevant verification of learning strategies and academic performance of students at private universities in Shandong Province

According to the Person correlation test, students' learning strategies, including cognitive strategies, meta-cognitive strategies and resource management strategies, show a significant positive correlation with their academic performance, which is consistent with previous research results (Mielle, 1993; Pintrich & DeGroot, 1990).

Among them, the correlation coefficients are learning strategies [r(873)=.228, p<.001], cognitive strategies [r(873)=.199, p<.001], meta-cognitive strategies [r(873)= .208, p<.001], and resource management strategies [r(873)= .173, p<.001]. This indicates that the higher the level of students' learning strategies, the better their academic performance will be. In terms of learning strategies, the correlation coefficient between meta-cognitive strategies and academic performance is the highest, reaching a significant level. The specific results are shown in Table 4.19.

Table 4.19 Summary of correlation coefficients between learning strategies and academic performance

	1	2	3	4
Learning strategy1	—			
Cognitive strategy2	.860***	—		
Meta-cognitive strategy3	.889***	.624***	—	
Resource management strategy4	.805***	.545***	.604***	—
Academic performance5	.228***	.199***	.208***	.173***

Note：N=873；***p＜.001

4.2.1.4 Correlation test between achievement goals and self-efficacy of students at private universities in Shandong Province

The overall achievement goals of students show a significantly correlated with their academic self-efficacy [r(873)= .260，p<.001]. However, there is no correlation between mastery-avoidance goals and students' academic self-efficacy [r(873)= .054, p=.111]; performance-approach goals [r(873)=.361, p<.001] and mastery-approach goals [r(873)=.384, p<.001] are significantly correlated with students' academic self-efficacy. This indicates that students who want to achieve good grades or want to improve their

comprehensive ability have a higher sense of academic self-efficacy. Students with performance-avoidance goals are negatively correlated with academic self-efficacy [r(873)= -.067, *p*=.048], which means that these students have a strong approach to avoid goals and their level of self-efficacy will be worse. The results are consistent with the conclusions of Jagacinski (2010), Nasiriyan (2011) and other researchers showing. The relevant results are shown in Table 4.20.

Table 4.20 Summary of correlation coefficients between achievement goals and self-efficacy

	1	2	3	4	5
Performance-approach1	—				
Performance-avoidance2	.054	—			
Mastery-avoidance3	.165***	.294***	—		
Mastery-approach4	.468***	-.012	.335***	—	
Achievement goals5	.618***	.602***	.701***	.636***	—
Self-efficacy6	.355***	-.067*	.054	.367***	.245***

Note：N=873; *p＜.05, ***p＜.001

4.2.1.5 Correlation test between achievement goals and learning strategies of students at private universities in Shandong Province

According to Pearson correlation test, there is no significant correlation between performance-avoidance goals and learning strategies [r(873)= -046, *p*=.171]. However, the other three dimensions of performance-approach goals [r(873)= .287，*p*<.001], mastery-avoidance goals [r(873)= .111, *p*<.001] and mastery-approach goals[r(873)= .398，*p*<.001] all show a significantly positively correlation with students' learning strategies. This indicates that students who want to get good grades to prove

themselves or want to improve themselves better have a certain level of learning strategies (Li, 2002; Bong, 2009). Performance-avoidance goals are unrelated to learning strategies, which is consistent with the research conclusions (Dweck & Legget, 1998), that is, students with performance-avoidance goals avoid appearing incompetent and use learning strategies less. The specific results are shown in Table 4.21.

Table 4.21 Summary of correlation coefficients between achievement goals and learning strategies

	1	2	3	4	5
Performance-approach1	—				
Performance-avoidance2	.054	—			
Mastery-avoidance3	.165***	.294***	—		
Mastery- approach4	.468***	-.012	.335***	—	
Achievement goals5	.618***	.602***	.701***	.636***	—
Learning strategies6	.287***	-.046	.111**	.398***	.262***

Note：N=873; ** $p<.001$, *** $p<.001$

4.2.1.6 Correlation test between academic self-efficacy and learning strategies

According to Pearson's correlation coefficient, the academic self-efficacy, including learning ability and learning behavior, shows a significantly correlation with learning strategies. The correlation coefficient between academic self-efficacy and learning strategies reached .501 [r(873)=.501, $p<.001$], and the correlation coefficient between learning ability, or learning behavior and learning strategies reached .429 [r(873)=.429, $p<.001$] and .442 [r(873)=.442, $p<.001$], respectively. This indicates that students with high academic self-efficacy pay more attention to the application of learning strategies, and those who with low academic self-efficacy pay less attention. Therefore, students with higher academic self-efficacy use more learning strategies and

have greater task persistence than those with lower academic self-efficacy. Self-efficacy is positively correlated with cognitive strategies and control strategies. The more students feel that they can do better in their studies, the more likely they are to invest more cognitive efforts in learning materials (Pintrich, 1989, 1999; Pintrich & DeGroot, 1990; Pintrich & Garcia, 1991). The specific results are shown in Table 4.22.

Table 4.22 Summary of correlation coefficients between self-efficacy and learning strategies

	1	2	3	4
Learning ability1	—			
Learning behavior2	.510***	—		
Self-efficacy3	.877***	.860***	—	
Learning strategies4	.429***	.442***	.501***	—

Note：N=873; *** $p<.001$

4.2.2 Regression analysis of achievement goals, self-efficacy, learning strategies, and academic performance of students at private universities in Shandong Province

This study included a regression discussion on achievement goals, self-efficacy, learning strategies and academic performance, respectively, and it further clarified the function of three independent variables in predicting academic performance. For the sake of ensuring the reliability of the regression analysis results, a multiple collinearity diagnosis was carried out at the same time. A VIF higher than 10 is regarded as the standard of judgment (Kutner, Nachtsheim, & Neter, 2004). Upon testing and verification, the VIF of each variable is under 10, indicating that they can be used for regression analysis. The specific results are as follows.

4.2.2.1 Verification of the predictive power of students' achievement goals on academic performance

Regression analysis was used to test the relationship between achievement goals and their four dimensions and students' academic performance. The results show that achievement goal has significant explanatory power on academic performance (β =.035, p<.05). When other variables are taken into account, it can be observed that there is a significant relationship between performance-approach goals and students' academic performance (β=.078, p<.05), which means that the higher the scores of students' performance-approach goals, the better their academic performance will be. The mastery-approach goals have a significant predictive power on students' academic performance (β=.094，p<.05), indicating that the higher the students' mastery-approach goal scores, the better their academic performance will be. The performance-avoidance goals have a significant negative impact on students' academic performance (β=-.108，p <.01), indicating that the higher their scores on the performance-avoidance goal, the lower their academic performance will be. Mastery-avoidance goals have no significant impact on students' academic performance. This result is consistent with the research conclusion of Zimmerman (2000) that achievement goals can directly affect students' academic performance. The specific analysis results are shown in Table 4.23:

Table 4.23 Summary Analysis of regression prediction of achievement goals and academic performance

	Academic performance			
	B	SE *B*	β	VIF
Performance-approach	.282*	.136	.078*	1.286
Performance-avoidance	-.304**	.099	-.108**	1.116
Mastery-avoidance	.138	.128	.040	1.251
Mastery-approach	.368*	.156	.094*	1.430
Achievement goals	.379*	.180	.035*	1.000
R^2	.035			
Adj R^2	.031			
F	4.454*			
df	(4,868)			

Note：N=872; *p＜.05, **p＜.01

4.2.2.2 Verification of the predictive power of students' self-efficacy on academic performance

According to the regression test, the overall academic self-efficacy of students has a significant impact on their academic performance (β=.146，p＜.001), indicating that self-efficacy has a positive predictive effect on their academic performance, that is, the higher the academic self-efficacy of students, the better their academic performance will be. Among them, learning ability has a significant impact on students' academic performance (β=.129，p＜.01), indicating that the higher the score of students' learning ability, the better their academic performance will be. However, another dimension of academic self-efficacy, learning behavior, has no significant impact on students' academic performance. This is consistent with the existing research results; that is, self-efficacy is an important factor in producing good learning outcomes, as well as in the

measurement and evaluation of self-learning ability (Sitzmann, 2013). Students with high self-efficacy are not only willing to learn, but also good at learning, thus achieving excellent results (Komarraju & Nadler, 2013; Christian, 2017). The specific analysis results are shown in Table 4.24:

Table 4.24 Summary analysis of regression prediction of self-efficacy and academic performance

	Academic performance			
	B	SE *B*	β	VIF
Learning ability	.780**	.235	.129**	1.352
Learning behavior	.242	.250	.038	1.352
Self-efficacy	1.043***	.240	.146***	1.000
R^2	.035			
Adj R^2	.031			
F	18.918***			
df	(4,868)			

Note：N=872; ** $p<.01$, *** $p<.001$

4.2.2.2 Verification of the predictive power of students' learning strategies on academic performance

The selection and use of learning strategies play an important role in learning results. According to the regression test, students' learning strategies have a significant predictive effect on their academic performance ($\beta=.228$， $p<.001$), that is, the better students' learning strategies, the better their academic performance will be. Considering other variables, students' cognitive strategies ($\beta=.100$， $p<.05$) and meta-cognitive strategies show a significant impact on their academic performance ($\beta=.115$， $p<.05$). Resource management strategies have no significant impact on students' academic

performance. This result further verifies that learning strategy is an important factor affecting students' academic performance, which is basically consistent with the previous research conclusion that appropriate learning strategy has a positive impact on students' academic performance (Mizelle, 1993; Wilson & Narayan, 2016). The specific analysis results are shown in Table 4.25:

Table 4.25 Summary analysis of regression prediction of learning strategies and academic performance

	Academic performance			
	B	SE *B*	β	VIF
Cognitive strategy	.607*	.265	.100*	1.766
Meta-cognitive strategy	.654*	.262	.115*	1.955
Resource management strategy	.261	.229	.049	1.698
Learning strategies	1.523***	.220	.228***	1.000
R^2	.052			
Adj R^2	.049			
F	47.881***			
df	(3,869)			

Note：N=872; *p＜.05, ***p＜.001

4.2.2.4 Verification of the predictive of students' achievement goals on the academic self-efficacy

To further understand whether there is a predictive or explanatory relationship between the two variables, the regression analysis results of students' achievement goals and academic self-efficacy show that overall achievement goals have a significant predictive power on students' academic self-efficacy (β=.245， p＜.001), Among them, students' performance-approach goal (β=.240，p＜.001) significantly predicted students' academic self-efficacy, that is, the higher the score of students' performance-approach

goal, the higher their academic self-efficacy; The mastery-approach goals (β=.274, p<.001) have a significant influence on students' academic self-efficacy, indicating that the higher the score of students' mastery-approach goals, the higher the students' academic self-efficacy will be. However, there is no significant relationship between performance-avoidance goals and mastery-avoidance goals on students' academic self-efficacy. This result is consistent with most research conclusions. For example, Walker and Greene (2009) believed that mastery goals and performance-approach goals are significantly positively correlated with academic self-efficacy, and Deemer (2010) found that mastery goals can positively significantly predict academic self-efficacy. The specific analysis results are shown in Table 4.26.

Table 4.26 Summary analysis of regression prediction of achievement goals and self-efficacy

	Self-efficacy			
	B	SE *B*	β	VIF
Performance-approach	.121***	.017	.240***	1.286
Performance-avoidance	-.023	.013	-□059	1.116
Mastery-avoidance	-.029	.016	-.060	1.251
Mastery-approach	.150***	.020	.274***	1.430
Achievement goals	.182***	.024	.245***	1.000
R^2	.186			
Adj R^2	.182			
F	55.511***			
df	(4,868)			

Note：N=872; *** p<.001

4.2.2.5 Verification of the predictive power of students' achievement goals on the learning strategies

The regression shows that the achievement goals have a significant effect on the prediction of learning strategies（β=.262，p＜.001）, that is, the achievement goals have a significant impact on the use of learning strategies. Among them, the performance-approach goals (β=.132，p＜.001） and the mastery-approach goals (β=.339，p＜.001）have significant influence on students' learning strategies, indicating that the higher the performance-approach goals score or the higher the mastery-approach goals score, the better the students' learning strategies use. The other two dimensions of achievement goals, performance-avoidance goals and mastery-avoidance goals have no significant influence on students' learning strategies. This basically verifies the achievement goal theory hypothesis. Students who master the goals are mainly focused on acquiring knowledge and skills, so they tend to use deep processing learning strategies such as understanding rather than memory. And for the students who performed toward the goal, they tend to prove that they are better than others by taking a test, to this end, they tend to use shallow learning strategies such as reciting, memorizing, etc. The students of performance-avoidance avoid being regarded as incompetent, and they would use less learning strategies (Dweck & Legget, 1998; Middleton & Midgley, 1997). The specific analysis results are shown in Table 4.27.

Table 4.27 Summary analysis of regression prediction of achievement goals and learning strategies

	Learning strategies			
	B	SE *B*	β	VIF
Performance-approach	.071***	.019	.132***	1.286
Performance-avoidance	-.02	.014	-.046	1.116
Mastery-avoidance	-.005	.018	-.011	1.251
Mastery-approach	.199***	.022	.339***	1.430
Achievement goals	.209***	.026	.262***	1.000
R^2	.174			
Adj R^2	.17			
F	64.420***			
df	(4,868)			

Note：N=872; ***p＜.001

4.2.2.6 Verification of the predictive power of students' academic self-efficacy on the learning strategies

The regression analysis is conducted to examine the relationship between students' academic self-efficacy and learning strategies. The results show that the overall academic self-efficacy of students has a significant impact on their learning strategies (β=.501，p＜.001). Among them, both learning ability (β=.276，p＜.001) and learning behavior (β=.301，p＜.001) have significant impact on students' learning strategies, which means that the higher the degree of academic self-efficacy, the better the use of learning strategies. The conclusion is consistent with the previous research results , that is, students' self-efficacy is closely related to the application of learning strategies and has a predictive effect on the use of learning strategies (Dong & Zhou 1995; Wilson et al. , 2016; Cai & Yang, 2019). The specific analysis results are shown in Table 4.28:

Table 4.28 Summary analysis of regression prediction of self-efficacy and learning strategies

	Learning strategies			
	B	SE *B*	β	VIF
Learning ability	.249***	.031	.276***	1.352
Learning behavior	.289***	.033	.301***	1.352
Self-efficacy	.537***	.031	.501***	1.000
R^2	.251			
Adj R^2	.250			
F	291.619***			
df	(2,870)			

Note：N=872; *** $p<.001$

In conclusion, the achievement goals, academic self-efficacy and learning strategies of students at private universities in Shandong Province can positively predict their academic performance. However, in the analysis of the influence of individual variables on academic performance, R^2 or the adjusted R^2 value is small, indicating that achievement goals, self-efficacy and learning strategies are only part of the influencing factors, and there may be other or potential explanatory variables, which can be further discussed in the follow-up research.

4.3 Analysis of the mediating effect of self-efficacy and learning strategies on the achievement goals and academic performance of students at private universities in Shandong Province

In this study, the causality among variables is discussed through regression analysis. A significant relationship between variables means that the variable has direct effect; if it is not significant, it means that there is no direct effect between the variables.

Besides, apart from the direct effect, there might be an indirect effect between two variables; that is to say, a mediating variable may exist between two variables, provided that the direct effect between variables should be significant - if any direct effect is not obvious, then the indirect effect cannot be established; that is, no intermediary effect is shown (Qiu, 2003).

Baron and Kenny (1986) stated briefly that three regression models should be used to verify the mediating effect: first, the independent variable should be able to significantly predict the dependent variable; second, the independent variable should be able to significantly predict the mediating variable; third, the mediating variable should be able to significantly predict the dependent variable. In this study, the self-variable refers to achievement goals, the intermediary variable is self-efficacy and learning strategies, and the dependent variable is academic performance. Based on the regression analysis above, achievement goals , academic self-efficacy and learning strategies all have a significant predictive effect on students' academic performance. It can be seen that the causal model of the hypothesis in this study conforms to the three verification methods. That is, students' academic self-efficacy and learning strategies have mediating effects on the relationship between achievement goals and academic performance. Nonetheless, some researchers argue that testing mediating effects in this way only means that the "mediating effects are very likely to exist". In this regard, Baron and Kenny (1986) stated that there is one more test condition: the effect of the independent variable should be weakened after adding the mediating variable and the intermediary variable should cause the independent variable to become completely insignificant to the

dependent variable, which indicates a complete mediation. Conversely, if the weakening effect is not obvious, the significance remains what it was, and it is called “partial mediation”. Therefore, in this section, the mediating effects of self-efficacy and learning strategies are examined and analyzed.

4.3.1 The mediating effect verification of academic self-efficacy between the students’ achievement goals and academic performance

The mediating effect of students’ academic self-efficacy on achievement goals and academic performance was examined by means of regression analysis. The result shows that the achievement goals of students have significant influence on their academic self-efficacy (β=.245， p＜.001), that students’ achievement goals have a significant influence on their academic performance (β=.071， p＜.05), and that students’ academic self-efficacy has a significant influence on their academic performance (β=.146， p ＜ .001). When considering the influence of achievement goals and academic self-efficacy on academic performance, the achievement goals no longer have a significant explanatory power (β=.038， p=.296), while the effect of self-efficacy on academic performance remains significant (β=.135， p＜.001). Hence, according to the judgment criteria of Baron and Kenny (1986), the mediating effect is completely valid; that is, students’ academic self-efficacy mediates the relationship between their achievement goals and academic performance. The detailed analysis results are shown in Table 4.29:

Table 4.29 Summary of regression analysis of intermediate effects of achievement goals, self-efficacy, and academic performance

	Self-efficacy M	Academic performance Y		
	Model1	Model2	Model3	Model4
Achievement goals	.245***	.071*		.038
Self-efficacy			.146***	.137***
R^2	.060	.005	.021	.023
Adj R^2	.059	.004	.020	.020
F	55.511***	4.454*	18.918***	10.063***
df	(1,871)	(1,871)	(1,871)	(2,870)

Note：The values in theTable are standardized coefficients β; $^{*}p<.05$, $^{***}p<.001$

4.3.2 The mediating effect verification of learning strategies between the students' achievement goals and academic performance

The mediating effect of students' learning strategies on achievement goals and academic performance is examined by means of regression analysis, and the results show that achievement goals of students have a significant influence on their learning strategies (β=.271，$p<.001$), achievement goals of students have a significant influence on their academic performance (β=.071，$p<.05$), and that the learning strategies of students have a significant impact on their academic performance (β=.225，$p<.001$). When considering the influence of students' achievement goals and learning strategies on their academic performance, the achievement goals no longer have a significant explanatory power (β=.011，p=.273), while the influence of learning strategies on academic performance remains significant (β=.222，$p<.001$). In this regard, the mediating effect is valid according to judgment criteria of Baron and Kenny (1986), which means that

students' learning strategies completely mediate the relationship between their achievement goals and academic performance. This result is consistent with the existing research results that achievement goals can have an indirect impact on academic performance through learning strategies (Li & Xu, 2007; Zhang, 2019). The specific analysis are shown in Table 4.30:

Table 4.30 Summary of regression analysis of intermediate effects of achievement goals, learning strategies, and academic performance

	Learning strategies M	Academic performance Y		
	Model1	Model2	Model3	Model4
Achievement goals	.269***	.071*		.011
Learning strategies			.225***	.222***
R^2	.073	.005	.051	.051
Adj R^2	.072	.004	.050	.049
F	68.175***	4.454*	46.579***	23.322***
df	(1,871)	(1,871)	(1,871)	(2,870)

Note: The values in theTable are standardized coefficients β; *$p<.05$, ***$p<.001$

4.3.3 The mediating effect verification of learning strategies between the students' self-efficacy and academic performance

Regression analysis was used to examine the mediating effect of students' learning strategies on their academic self-efficacy and academic performance. The results show that students' academic self-efficacy has a significant influence on their learning strategies (β=.501，$p<.001$). Academic self-efficacy of students has a significant influence on their academic performance (β=.146，$p<.001$), and learning strategies of students have a significant impact on their academic performance (β=.225，$p<.001$).

When students' academic self-efficacy and learning strategies are considered, the explanatory power of academic self-efficacy is no longer significant (β=.044， p=.249), while the influence of learning strategies on academic performance is still significant (β =.203， p＜.001). Therefore, according to the judgment criteria of Baron and Kenny (1986), the mediating effect is established, which means that the learning strategies fully mediates the relationship between students' academic self-efficacy and academic performance. Just as some researches believed that self-efficacy needs to affect students' performance through cognitive and metacognitive strategies (Pintrich & Schunk, 2002; Zimmerman, 2000; Miller & Greene, 1993). The specific analysis are shown in Table 4.31:

Table 4.31 Summary of regression analysis of intermediate effects of self-efficacy, learning strategies, and academic performance

	Learning strategies M	Academic performance Y		
	Model1	Model2	Model3	Model4
Self-efficacy	.501***	.146***		.044
Learning strategies			.225***	.203***
R^2	.252	.021	.058	.052
Adj R^2	.250	.020	.057	.050
F	291.461***	18.918***	46.579***	23.965***
df	(1,871)	(1,871)	(1,871)	(2,870)

Note：The values in theTable are standardized coefficients β; *** p＜.001

4.3.4 Multiple mediating effect verification of self-efficacy and learning strategies on the relationship between achievement goals and academic performance of students at private universities in Shandong Province

With reference to the testing method of multi-step mediation variables proposed by Hayes (2017), model 6 is selected, calculation times is 5,000, and the confidence interval is 95%. The data consolidation results are shown in Table 4.32. The achievement goals have a significant indirect influence on academic performance, and mediated testing results are not included 0 (LLCI=.0660, ULCI=.1925). The direct influence of achievement goals on academic performance is no longer significant after controlling for self-efficacy and learning strategies, and the confidence interval (LLCI=-.3217, ULCI=.3992) includes 0. Therefore, the self-efficacy and learning strategies play multiple mediating roles in the influence of achievement goals on the academic performance of students.

Table 4.32 Analysis of the multiple mediating effects of self-efficacy and learning strategies on students' achievement goals and academic performance

Total effect of X(Achievement goals) on Y(Academic performance)

Effect	se	t	p	LLCI	ULCI
.3795	.1798	2.1105	.0351	.0266	.7324

Direct effect of X(Achievement goals) on Y(Academic performance)

Effect	se	t	p	LLCI	ULCI
.0388	.1837	.2111	.8329	-.3217	.3992

Indirect effect(s) of X(Achievement goals) on Y(Academic performance):

	Effect	BootSE	BootLLCI	BootULCI
TOTAL	.3407	.0732	.2043	.4979
Ind1	.0533	.0538	-.0499	.1636
Ind2	.1629	.0522	.0749	.2757
Ind3	.1245	.0321	.0660	.1925

Indirect effect key:
Ind1 Achievement Goals -> Self-Efficacy -> Academic Performance
Ind2 Achievement Goals -> Learning Strategies -> Academic Performance
Ind3 Achievement Goals -> Self-Efficacy -> Learning Strategies -> Academic Performance

Based on results of the above analyses, the hypothesis testing is as follows:

An independent-samples t-test and One-way ANOVA testing were adopted to analyze the differences between students of various genders, majors, places of origins and grade levels. The results show that in hypothesis H1, there are no significant differences in the effects of achievement goals, self-efficacy, and learning strategies on the academic performance of students of different genders at private universities in Shandong Province;

there are no significant differences in learning strategies between students of different subjects, places of origins and grade levels, and there are some significant differences in regard to achievement goals, self-efficacy, and academic performance.

Based on the Pearson correlation and regression analysis, the achievement goals, self-efficacy and learning strategies, all significantly affect the academic performance of students at private universities in Shandong Province. Therefore, in hypothesis H_{2a}, the achievement goals of students at private universities in Shandong Province have a significant impact on their academic performance, which is valid; in hypothesis H_{2b}, the self-efficacy of students at private universities in Shandong Province has a significant impact on their academic performance, which is valid; and in hypothesis H2c, the learning strategies of students at private universities in Shandong Province have a significant impact on their academic performance, which is also valid.

Based on the mediated analysis, the following hypothesis are valid: hypothesis H_{3a}, that the achievement goals of students at private universities in Shandong Province affect academic performance through self-efficacy; hypothesis H_{3b}, that the achievement goals of the students affect achievement through learning strategies; and hypothesis H_{3c},that self-efficacy affects the academic performance of the students through learning strategies.

Based on the multi-step testing method proposed by Hayes (2017), the achievement goals can affect the academic performance of students at private universities in Shandong Province through the dual mediators of academic self-efficacy and learning strategies. Thus, hypothesis H_{3d} is valid.

CHAPTER 5

DISCUSSION

Based on questionnaire survey and focus group interview, this study deeply discusses the relationship between achievement goals, self-efficacy, learning strategies and academic performance of students at private universities in Shandong Province. This chapter is based on the research results of chapter 4 and combined with the existing research conclusions. This chapter is divided into three sections. The first section discusses the differences between students from different backgrounds in achievement goals, self-efficacy, learning strategies and academic performance; the second section discusses the influence of achievement goals, self-efficacy and learning strategies on students' academic performance at private universities in Shandong Province; and the third section discusses the indirect influence of achievement goals of students at private universities in Shandong Province on academic performance through self-efficacy and learning strategies.

5.1 Differences in achievement goals, self-efficacy, learning strategies and academic performance of students from different backgrounds

5.1.1 The significant differences in the achievement goals of students at private universities in Shandong Province in relation to their majors and places of origin and the lack thereof in relation to their gender and grade level.

Through this research, it was found that there is no difference in the achievement goals and dimensions of students of different genders and grade levels at private universities in Shandong Province. This finding is different from those of some previous research about college students. For instance, Wang (2013) found that male and female college students show extremely significant differences in mastery-avoidance and performance-avoidance, and female students rate significantly higher in these areas than male students; there are also significant differences in performance-approach factors between college students of different grade levels, and they show significant differences in mastery-avoidance and performance-avoidance. Zhang, Hou, Yang and Sun (2017) took 800 college students from Hunan Agricultural University as research subjects, and they found that it was easier for girls to set performance goals than for boys, and that for boys, it was easier to set and master goals than for girls.

This research shows that students are different in terms of achievement goals and their related aspects from the perspective of majors and place of origin. Regarding majors, the mean score of science and engineering students was higher than that of literature and history students in terms of overall achievement goals, indicating a distinct difference. The mean score of science and engineering students was also higher than that of literature and history students in terms of performance-approach goals and performance-avoidance goals. In this study, there is no difference in mastery-avoidance goals or mastery-approach goals. This may be because science and engineering students have higher demands on their intellects and must make greater efforts due to the characteristic difficulty their subjects' of courses, so they strive to do well in their studies

to get attention.

In terms of the place of origin, this study found that students from urban areas have lower mastery approach goal than those from rural areas, which is consistent with Julia's (2012) study, which indicates that students from rural areas are concerned about the improvement of their abilities, but also worry about failure, choosing easier tasks to avoid failure.

At the same time, in this study, students of science and engineering tend to have higher performance goals than students of literature and history, that is, they are more inclined to get good grades in college. This is basically consistent with the conclusion expressed by several science and engineering students in the interview:

1A (Machine Design, Production and Automation) *"I believe learning performance is important in college. And my goal is not to fail in any exam then I will apply for several skill diplomas"*.

2B (Automobile Service Engineering) *"I need to finish my course, succeed in the exam and get the credits. If I have bad academic performance, I need to make the best use of my time to study, I need to be better than others"*.

3B (Computer Science and Technology) *"I believe learning rating is important. When I was a freshman, I had a lot of ideas and took part in many activities of clubs. Later I realized that my comprehensive ability couldn't be enhanced immediately. I need to study first in order to improve my capability. And I must do better than others"*.

Over all, the results of this study on the differences between students from different backgrounds in terms of achievement goals and their related dimensions are

both consistent and inconsistent with existing research conclusions. First, this may be related to differences in the research subjects. Existing studies mainly focus on primary and secondary school students or students at public universities. The subjects of this study are private university students, with a general learning foundation in middle school and gradually clearer self-cognition after entering the university. Second, the lack of differences may be related to the insufficient sample size and the sample dependence, so the contradictory results should be explored further.

5.1.2 The obvious differences in the self-efficacy of students at private universities in Shandong Province in relation to major and the lack thereof in relation to gender, grade level, or place of origin.

According to the results of this study, the academic self-efficacy of students at private universities in Shandong Province is mainly related to their majors; that is, in terms of learning ability, students of science and engineering score higher than students of literature and history, although there is no difference in overall self-efficacy. Meanwhile, there are no differences related to other background variables such as gender, grade level and the place of origin. These results are different from those of some studies. For example, Eccles (2002) pointed out that there is a significant relationship between gender and academic self-efficacy; that is to say, academic self-efficacy also varies by different genders. For example, the higher self-efficacy of male college students is mainly reflected in science and engineering. Guo (2016) and Cai (2019) also took college students as research subjects and found that there was a gender-related difference in self-efficacy. Female students score higher than male students, and there was also a

difference related to grade level, with fourth-year students scoring the highest. However, the results of this study are consistent with the research conclusion of Wang (2013); that is, that college students of different majors show strong differences in their sense of self-efficacy in terms of learning ability and their academic self-efficacy total scores. Specifically, college students majoring in science and engineering score significantly higher than those majoring in literature and history. Yong (2010) took preparatory students from a private university in Malaysia as the research subject, and the results showed that there was no significant difference in self-efficacy in terms of group, gender or age, while engineering and business students often had more similarities in self-efficacy than differences.

Therefore, there are many inconsistencies in the analysis of background variables of self-efficacy in college students, which may be related to the research objectives, sample sizes, and characteristics, and so on, which need to be discussed further.

5.1.3 The lack of differences in the learning strategies of students at private universities in Shandong Province in terms of gender, major, place of origin, and grade level

Many research projects have shown that there were individual differences in applying learning strategies. For instance, Zimmerman and Martinez-Posn (1990) found that the use of learning strategies increased gradually from primary to middle school and then decreased in high school; the research of Zhao (2005), Zhou (2014), Xiang (2019) showed that the use of learning strategies of students of different genders,

grade levels, and majors were different. Zhang and Wang (2016) conducted research on the learning strategies of more than six thousand students at private universities. The results of their research showed that there was a difference related to gender and major. When interviewing students, it seems that students did not care about learning strategies or failed to understand the meaning of them:

2A (Major in Civil Engineering) *"I have few good learning strategies. I only want to listen carefully to teachers during class and not to fail my exam. I am lazy in my study and I will just take one step and look around before taking another".*

1F (Preprimary Education) *"Listen to teacher during class and review before exams. Learning strategy doesn't matter. Anyway, our teacher will tell us which part will be tested".*

As the learning foundation of students at private universities varies greatly, it is of great importance and urgency to effectively use learning strategies to improve the quality of their learning, considering that in this study, the learning strategies of students of different backgrounds do not show the opposite gender, which may be related to the research object and sample size. It is necessary to continue to pay attention to students' learning strategies, learn about the use of them, and guide and constructthem in a targeted way.

5.1.4 The differences in the academic performance of students at private universities in Shandong Province in terms of gender, major, and grade level, but not their place of origin.

The learning performance of students is a factor of learning effects. The

research shows that the learning performance of students at private universities in Shandong is related to gender, major, and grade level: The learning performance of girls is higher than that of boys, the learning performance of art students is higher than that of scientific and engineering students, and the learning performance of freshman is higher than that of sophomore and junior students. According to the results of the research, the learning performance of girls is higher than that of boys. This result is consistent with the research of Zhu (2012). We can also see this in daily life: The ratio of girls who must retake a course after failing to pass an examination or drop out of school is relatively low. The difference in learning performance related to major and grade level has been mentioned little in previous research. The results of this research are suitable for literature and history students. Freshmen who have just finished contending with the rigors ofhigh school cannot anticipate their futures. As a result, they still have good learning habits and study just as seriously as they did in high school. Thus their learning performance is higher than that of sophomore and junior students.

5.2 The influence of achievement goals, self-efficacy, and learning strategies on students' academic performance at private universities in Shandong Province

5.2.1 The direct effect of achievement goals on the academic performance of students at private universities in Shandong Province

According to the findings of this study, the overall achievement goals of students is positively correlated with their academic performance and have a direct impact on it. In each dimension of achievement goals, the performance-approach goal and mastery-approach goal encourage students to achieve good academic performance, while

the higher the performance-avoidance goal perception, the worse students' academic performance will be. This result is consistent with the findings of Elliot and McGregor (2001), namely, that the performance-approach goal is a positive predictor of students' academic performance, while the performance- avoidance goal is a negative predictor of students' academic performance. However, in this study, the mastery-approach goal is also a positive predictor of students' learning performance, which is consistent with the research conclusion of Button (1996). This indicates that for private university students in Shandong Province, their performance on high school or college entrance examinations is not ideal. However, as college students, they have a clear goal to pursue personal growth and development, and they will not give up completely on their academic performance. Therefore, the mastery-approach goal has a significant predictive power on students' academic performance.

In a word, achievement goals can directly affect students' academic performance. This is consistent with the conclusions of Zimmerman (2000) and Zhang (2019) that achievement goals can directly affect students' academic performance. However, some research conclusions do not support this result. For example, Li and Xu (2007) believed that achievement goals have no significant direct impact on academic performance. This may have something to do with the differences in research subjects. Previous studies mostly focused on primary and middle school students, while this study focused on students at private universities. Dull, Schleifer and McMillan (2015) found that the combination of mastery ability and performance goal motivation may provide better results related to course performance and reduce the results of dysfunctional study

habits or attitudes. Meanwhile, in focus group interviews, it has also been found that students pay more attention to the establishment and role of goals and generally believe that clear goals and their realization are very important for personal development:

1D (Major in Nursing) *"Firstly, I will set up appropriate goals based on my capability. For example, my present goal is to become a graduate student. And I will pay attention to improving my comprehensive capability. As a result, in my study, I will work harder. I believe I will realize my dream if I keep going"*.

3C (Major in Logistics Management) *"In my opinion, I study in the university to improve my ability in all aspects. Firstly, I should define my position accurately to know where I need more efforts. In this way, I can achieve my goal"*.

1G (Major in Business English) *"I have a clear goal of passing the Test for English Majors and being enrolled as a graduate student. I have no pressure in my study and I can achieve a good learning rating without hard work. I'm optimistic about my future"*.

5.2.2 The direct positive effect of self-efficiency on the academic performance of private university students

This research found that the self-efficacy of students has a direct impact on their academic performance. In other words, if students believe that they can do well in their studies, their self-efficacy will improve and they will have higher confidence in their abilities. Thus, students with higher self-efficacy will achieve better academic outcomes. This is consistent with the existing research results; that is, self-efficacy is an important factor in producing good learning outcomes and is a measure and means of evaluation of

self-learning ability (Sitzmann, 2013). Students with a high sense of academic self-efficacy are not only willing to learn, but also good at learning. Even if they encounter difficulties, they try to overcome them. Therefore, it has a positive impact on their academic achievements and helps them achieve excellent results (Komarraju & Nadler, 2013; Christian, 2017; Stajkovic, 2018; Cai, 2019). This also means that guiding students to increase their sense of academic self-efficacyincreases their successful experience and makes them confident and successful in their studies. In the interviews with students, students generally reported believing that to obtain a satisfactory learning result, some required qualities included “confidence, persistence, effort, ability to set goals”, and so on.

2B (Major in Civil Engineering) *"Learning is boring, but it is important to stick to it. If you stick to your own efforts, you will get good results."*

3B (Major in Computer Science and Technology) *"Learning is about perseverance and confidence."*

1C (Major in Logistics Management) *"Persistence, optimism and a desire to learn are important factors for personal development or achieving a satisfactory result. "*

5.2.3 The direct positive effect of learning strategies on the Academic Performance of private university students

The current research all believe that appropriate learning strategies have a positive impact on the learning achievement of students. Learning strategy is one of the best variables to predict the learning achievement of students (Pintrich & DeGroot, 1990), the research of Wilson and Narayan (2016) believed that learning strategy is an important

prediction factor of task performance, and this research also proves this. In this research, the learning strategies including cognition strategies, metacognition strategies and resources management strategies, all of them have a positive correlation on academic performance. That is to say, the better students use their learning strategies, the higher their academic performance will be. Learning strategies influence the academic performance of students directly.

1E (Major in Preprimary Education) *"Now it's important to use online resources for learning, and a good, quiet learning atmosphere is important for learning results."*

1F (Major in Business English) *"Classroom learning is very important, learning to often reflect, summarize, organize."*

1G (Major in Nursing Science) *"To strengthen exercise training, communication with teachers is very important."*

5.3 The indirect impact of achievement goals through self-efficacy and learning strategies on the academic performance of students at private universities in Shandong Province

5.3.1 The direct effect of achievement goals on the self-efficacy of students at private universities in Shandong Province

According to the findings of this study, the higher the overall perceived achievement goals of students at private universities in Shandong Province, the stronger their academic self-efficacy, and achievement goals can directly affect students' academic self-efficacy. In each dimension, performance-approach goals and mastery-approach

goals and self-efficacy show a positive correlation, indicating that studentswho pursuit high academic performance goals or strive for their own improvement and comprehensive development will be motivated to achieve their goal of expectations, so their academic self-efficacy will be higher, which is consistent with the existing conclusions (Coutinho & Neuman, 2008; Walker & Greene, 2009). However, their self-efficacy level will be low if their performance is strong (Jagacinski, 2010; Nasiriyan, 2011).

5.3.2 The effect of achievement goals of students at private universities in Shandong Province on their academic performance through self-efficacy

This study found that the achievement goals of students at private universities in Shandong Province can not only directly affect students' academic performance, but also affect students' academic performance through self-efficacy. After the addition of self-efficacy as an intermediary variable, the effect of achievement goals on students' academic performance is no longer significant. Therefore, self-efficacy has a complete mediating effect on achievement goals and students' academic performance. In other words, achievement goals can indirectly affect students' academic performance through self-efficacy.

These results are consistent with the findings of Zheng (2011), Chen (2011), Zhu (2012), and Li and Yang (2018); that is, self-efficacy plays an intermediary role in the influence of achievement goals on academic performance. Meanwhile, Bandura (1997) believed that self-efficacy is people's belief in their ability to organize and implement the behavioral processes required to reach specific achievement goals, and it is a dynamic

factor in motivation and behavior. This study, to some extent, confirms the view that students who hold achievement goals orientation, especially with performance-approach goals and mastery-approach goals, have a strong sense of academic self-efficacy, study more seriously and diligently, and achieve good academic performance.

5.3.3 The direct effect of achievement goals on the learning strategies of students at private universities in Shandong Province

This study found that the achievement goals of students at private universities in Shandong Province have a direct impact on students' learning strategies, that is, the higher the level of student achievement goals, the better their learning strategies will be. According to the hypothesis of achievement goal theory, students who master goals mainly focus on acquiring knowledge and skills in learning, so they will use in-depth processing such as understanding learning strategies, and students with performance-approach goals use exams to prove that they are better than others in learning, so they will use certain learning strategies, while students with performance-avoidance goals avoid looking incompetent and use less learning strategies, so performance-avoidance goals have no correlation with learning strategies (Dweck & Legget , 1998; Middleton & Midgley, 1997). This result is consistent with the conclusion of Xiangli et al. (2019); that is, learners have different understandings and attitudes towards learning due to different achievement goals, so there will inevitably be great differences in the selection of learning strategies.

5.3.4 The effect of achievement goals of students at private universities in Shandong Province on their academic performance through learning strategies

Through the research, the achievement goals of students at private universities in Shandong Province can exert indirect influence on students' academic performance through learning strategies. When learning strategies are added as mediating variables, the effect of achievement goals on students' academic performance is no longer significant. Therefore, learning strategies have a complete mediating effect on achievement goals and students' academic performance, which is basically consistent with the research conclusions of Luo (2018) and Zhang (2019); That is, achievement goals reflect students' motivation and attitude towards learning, the most complex psychological cognitive activity of human beings, while learning strategies are their control and regulation of this cognitive process, which influence and promote each other, and to a large extent determine the learning efficiency and effect.

5.3.5 The indirect effects of achievement goals on the academic performance of students at private universities in Shandong Province through self-efficacy and learning strategies

This study further discusses the role of self-efficacy and learning strategies in the relationship between achievement goals and academic performance. The results show that self-efficacy and learning strategies play multiple mediating roles in the influence of achievement goals on academic performance. This shows that, regarding students' academic performance, although achievement goals, determine the direction of their learning, self-efficacy is a dynamic mediator between motivation and behavioral factors

of learning strategies for students' learning process control and adjustment, and with its intervention in the achievement goals' influence on academic performance, the direct impact of the achievement goals abates or is an influence no longer. Therefore, schools should pay more attention to the cultivation of students' self-efficacy and the teaching of learning strategies because they play a powerful role in guiding students' learning outcomes.

All in all, this study takes students from private universities in Shandong Province as the research subjects. By sorting out the existing literature and using questionnaire survey supplemented by focus group interviews, it systematically examines the relationship between achievement goals, self-efficacy, learning strategies, and academic performance, and yields the following conclusions

First, there are no differences in achievement goals, self-efficacy, learning strategies, and academic performance between students of different genders at private universities in Shandong Province. There are no differences in learning strategies between students of different majors, places of origin and grade levels, but there are some differences in achievement goals, self-efficacy and academic performance.

Second, there is a causal relationship between the achievement goals, self-efficacy, learning strategies and academic performance of students at private universities in Shandong Province. The higher the achievement goal degree of students, the better their academic performance; the higher the achievement goal degree, the higher their self-efficacy; the higher the self-efficacy of students, the better their academic performance; the higher the achievement goal degree of students, the more often they will

use learning strategies. The more often students use learning strategies, the better their academic performance.

Third, the achievement goals of students at private universities in Shandong Province have direct effects on their learning achievement, and they also have indirect effects on their learning achievements through self-efficacy and learning strategies.

CHAPTER 6

CONCLUSIONS

The purpose of this study is to examine the relationship between the achievement goals, self-efficacy, learning strategies, and academic performance of students at private universities in Shandong Province. Through a literature review, the correlation between achievement goals, self-efficacy and learning strategies was analyzed, and the research on the relationship between achievement goals, self-efficacy, learning strategies and learning performance was further discussed. In order to solve the problems in this study, a questionnaire survey was adopted as the main method of data collection, and focus group interviews were used as an auxiliary method when conducting a questionnaire pre-test, formal test, interview, and other research procedures. The relevant data were collected and analyzed using a t-test, one-way anova, product-moment correlation analysis, regression analysis, and so on. The results and discussions of the statistical analysis were described in Chapter 4 and Chapter 5.

6.1 Theorectical contribution

This study explores the relationship between the achievement goals, academic self-efficacy, learning strategies, and academic performance of students at private universities in Shandong Province and finds that their achievement goals, self-efficacy,

and learning strategies affect their academic performance. Among these, achievement goals not only have a direct impact on academic performance, but also have an indirect effect on academic performance through self-efficacy and learning strategies. Compared with previous studies, the main contributions of this study are as follows:

6.1.1 From the perspective of research subjects, this study exclusively takes Chinese private college students as sample sources, discusses the motivation and cognitive factors behind their learning processes, and deeply analyzes the characteristics of the achievement goals, self-efficacy, and learning strategies of this group and these factors' influences on academic performance. The development of private higher education in China is relatively recent, and there is a distinct difference between the students at such institutions and traditional public university students. Therefore, this study takes private university students as the research subjects, so that they can be compared with the existing research results on primary and middle school students or public university students not only further enriching the research on student learning, but also providing some references for the rapidly developing private higher education system and teaching management in China.

6.1.2 From the perspective of research content, this study systematically sorted out the theoretical development of, and related research on, achievement goals, self-efficacy, learning strategies, and so on, and it combined motivation factors with cognitive factors, focusing on discussing the influence of various variables on students' academic performance. Although there is a lot of research on the factors influencing students' learning achievement, most of it focuses on one or two variables, and little

research focuses on three variables: achievement goals, self-efficacy, and learning strategies. Therefore, this study expands on the existing research on the influence of motivation and cognitive factors on students' learning to some extent.

6.1.3 Based on the research results, this study systematically discusses the influence mechanism of the achievement goals, self-efficacy, and learning strategies of students at private universities in Shandong Province on their academic performance. In particular, it not only analyzes the direct effects of various motivating and cognitive factors on academic performance, but further examines the multiple mediating effects of self-efficacy and learning strategies on achievement goals and academic performance, which is conducive to understanding the factors influencing students' learning processes from a relatively new perspective.

6.2 Implications of study

This study mainly discusses the relationship between the achievement goals, self-efficacy, learning strategies, and academic performance of students at private universities in Shandong Province, and it clarifies the influencing mechanism among various variables. Based on the research results, the following inspirations are proposed:

6.2.1 Implications for private universities

6.2.1.1 Getting to know the students' learning psychology and emphasizing the influence of the non-intelligent factors on students' learning.

Both the previous studies and the results of this study show that non-intelligence factors, including achievement goals and self-efficacy, are important to the learning, growth, and development of students. During their learning process, both

performance-approach goals and mastery-approach goals have a positive effect on students, promoting their learning abilities and yielding good results. Those students may face challenges. Whether they succeed or fail, they can analyze the reasons for their performance correctly and adjust their learning methods if they fail. The higher the self-efficacy of students, the more confidence they will have in realizing their goals. Based on this knowledge, colleges should lead students to set positive achievement goals and keep strengthening their self-efficacy.

First, influenced by the standard of scores set by the National College Entrance Examination, all private colleges should conduct an investigation into the learning conditions of new students to understand their performance in terms of intelligence and non-intelligence factors, learning abilities, and learning level. Based on the investigation, colleges can organize disciplines and activities keeping in mind the special characteristics of students. Second, after students finish contending with the rigors of high school, they need to adapt to college life and change their learning methods constantly. They will face the need for continuous development and many problems in the process. As a result, colleges should establish a dynamic follow-up mechanism for monitoring students' performance to understand their learning conditions over time. In this way, colleges can strengthen their guidance of students' learning and life issues when they have trouble, as well as help and train students from the perspective of improving their cognition, protecting their enthusiasm for learning and positive attitude, leading them to set appropriate goals, and promoting their confidence in finishing learning tasks and encouraging them to work harder towards them. In this way, students can grow healthily

and comprehensively.

6.2.1.2 Enhancing the guidance and training of the the achievement goals and academic self-efficiency of students

First, teachers should consciously guide students to compare their present to their past during the teaching process. This approach can help students focus on how much effort they need to devote to their work and to applying learning methods. Students should strive to improve their knowledge and focus on expanding their capabilities. Second, teachers should improve their teaching methods by making the teaching content meet the demands of industries and society, making their classes more interesting and diversified. Teachers should also attach importance to promoting students' ability to create by providing them with open and challenging learning tasks. In this way, students' achievement-oriented goals can be enhanced. Third, students should be encouraged or led to take part in various professional and academic activities meant to expand their academic horizons, help them gain successful experiences, and improve their self-efficacy. In addition, both the colleges and teachers should keep paying attention to monitoring students' growth, understanding their learning conditions, encouraging them to become more confident, and helping them finish their college life smoothly.

6.2.1.3 Paying more attention to learning strategies of students and help them to use learning strategies appropriately.

Through the interviews, it was found that some college students know little about learning strategies, and some think that it does not matter whether they employ them. This study suggests that colleges should attach importance to the learning strategies

of students with the aim of improving their ability to use such strategies. Students should be guided to understand relative learning targets and materials, design a reasonable learning plan, and expect realistic learning results and difficulty during the learning process. Colleges should lead students to overcome interference from others and supervise their own learning. Focusing on their weaknesses in cognition and management strategies, students should set up a clear purpose for their learning and use strategies of time management, organization, and hard work; peer learning should also be strengthened to implement its complementary effect. In addition, colleges should value the teaching and learning of students' learning strategies, enhance the direction of them, and combine them with professional education. Colleges should inspire students to learn, improve their self-efficacy in learning, focus on their learning processes and learning effects, and make sure that students can grow healthily.

6.2.1.4 Establishing a scientific system of evaluation and promoting students' comprehensive development

An important aspect of this study is that the subject is the academic performance of students at private universities. During the interviews, almost all the students expressed that although they need to ensure that they achieve good grades first, they ultimately need to improve their comprehensive abilities. This is true for both the acquisition of professional knowledge and the cultivation of overall abilities, even though high academic performance represents cultivation of learning abilities. To some extent, this also shows that the college's evaluation of students should be more comprehensive, and focus on the improvement of students' abilities in all respects instead of

concentrating only on their academic performance. Colleges should create a positive learning atmosphere for students and lead them to set up positive values of learning and achievement to ensure they can grasp knowledge and improve their abilities.

6.2.2 Implications for students

6.2.2.1 Adjusting individual cognition and setting up rational goals

Learning goals are an important guarantee for the smooth completion of college life. Excessively high goals may cause pressure for students, while excessively low goals may hurt their enthusiasm; both are bad for learning, and they are not conducive to normal learning and development. As a result, college students should set reasonable goals based on their actual learning conditions, especially considering the difference between their past and present. They need to recognize and analyze their problems in development correctly and make sure they can complete their studies successfully.

6.2.2.2 Practicing right attribution and strengthening faith in learning

The study shows that both achievement goals and self-efficiency have direct or indirect influence on students' academic performance. Attribution training can improve students' achievement motivation level and improve their self-efficiency, which is an effective way to give psychological coach. However, excessive attribution of success or failure will have a bad impact on the achievement of students. As a result, if the college students have good grades, they should do less attribution about the external and uncontrollable factors and do more about their ability. In this way, their self-efficiency in study can be strengthened; if students can not obtain good grades, they need to emphasize

the external factors like insufficient work, the difficult question instead of focusing on internal factors. In this way, they can keep their confidence and struggle for success for next time.

6.2.2.3 Adjusting learning strategies and improving learning efficiency

Using learning strategies is relative to the achievement goals and self-efficiency. Using scientific and effective learning strategies can finish learning tasks, improve confidence, enhance self-efficiency and better realize the goals. As a result, college students should learn to use all learning skills to solve problem like setting up learning goals or plans, organizing learning materials, reflecting and supervising learning process, efficient management of study time and reasonable use of electronic information. In this way, students can improve their learning efficiency.

6.3 Limitation of the study

6.3.1 There are limitations to the study of variables. Academic performance is only a single index to measure the comprehensive learning effect of students, and it is difficult to fully reflect the comprehensive learning situation. Moreover, students' academic performance is affected by many factors, and it is difficult to control the influence of some other variables, such as their intelligence, learning attitude, learning style, and so on.

6.3.2 There are limitations to the study of instruments. In this study, relatively authoritative and mature scales should be sought when selecting research tools. However, there are few available scales, and some questions are too long or complex to be easily understood, causing some underperforming students feel bored. As a result,

there are inevitably some measurement errors in the results of the research.

6.3.3 This research includes an analysis of students from different backgrounds, but the analysis is based only on the feelings of the participants at one point in time without measuring changes over time. At the same time, although this study includes a large sample size with normal distribution, there is a certain sample size gap in some background variables, which may limit the research results.

6.4 Future research

6.4.1 In respect to the participants in the research, the sample subjects of the questionnaire survey in this study are mainly undergraduate students of private universities in Shandong Province, excluding junior college students and other non-enrolled students. Therefore, this suggests that in future relevant studies, the sample selection should be extended to include all types of students and those at other private colleges and universities outside Shandong Province, which will yield results that more comprehensively and objectively reflect the common characteristics of all private college students.

6.4.2.2 In respect to the variables in the research, learning is a complex process, and there are many factors that influence it, including subjective factors, such as students' IQ level and learning style, as well as objective factors, such as teachers' teaching methods, curriculum design, and the school's atmosphere. Universities should pay more attention to the cultivation of students' comprehensive qualities and abilities. In the future, if various factors can be combined to conduct in-depth discussions on effects on students' learning, the research results will be more realistic and targeted.

6.4.3 In respect to methodology, in this study, a questionnaire was the means of collecting data to understand the status quo of students' learning environment at private universities. However, when answering the questionnaire, it is possible that participants may have defended themselves or answered the questions carelessly or wrongly. It is difficult to assess their real reactions and analyze the reasons for such psychological perceptions. Although there were focus group interviews to supplement the research results, the data are not comprehensive or detailed enough. Therefore, it is suggested that future research should strengthen qualitative aspects, such as interviews or observations, as much as possible to deeply understand the learning process of private university students.

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APPENDIX

Questionnaire on achievement goals, self-efficacy and learning strategies

of students at private universities in Shandong Province

Section 1 Basic information

(Complete instructions: Please tick "√" in the box matching your personal data)

1. Gender：①Male□ ②Female□

2. Grade Level：①Grade1□ ②Grade2□ ③Grade3□

3. Student Number：_____(Please fill it in truthfully)

4. Place of Origin：①Town□ ②Countryside□

5. Major：①Science and Engineering□ ②Literature and History□

Section 2 Questionnaires

Questionnaire 1：Achievement goal scale (Quoted and adapted from Xiao, 2013)

Answer instructions：There are 12 questions below, all of which are your attitudes towards learning and performance in campus life. Please compare the description with your actual situation and play "√" on the options that match you. Each item is a single item, please do not miss or choose more。If the description is very suitable for your situation or feelings, please tick "√" on "7"， If the description is not in line with your situation or feelings, please tick "√" on "1"， If you do not agree or disagree with the statement (neutral), please tick "√" on "4". (1= not at all true of me, 7= very true of me).

1. My goal in this class is to get a better grade than most of the other students.
2. It is impormant for me to do well compared to others in this class.
3. It is impormant for me to do better than other students.
4. I just want to avoid doing poorly in this class.
5. My fear of performing poorly in this class is often what motivates me.
6. My goal in this class is to avoid performing poorly.
7. Sometimes I'm afraid that I may not understand the content of this class as thoroughly as I'd like.
8. I worry that I may not learn all that I possibly could in this class.
9. I am often concerned that I may not learn all that there is to learn in this class.
10. I desire to completely master the material presented in this class.
11. I want to learn as much as possible from this class.
12. It is impormant for me to understand the contents of this course as thoroughly as possible.

Questionnaire 2：Academic self-efficacy questionnaire

Answer instructions：There are 10 questions below, all of which are your attitudes towards learning and performance in campus life. Please compare the description with your actual situation and play "√" on the options that match you. Each item is a single item, please do not miss or choose more。If the description is very suitable for your situation or feelings, please tick "√" on "5"， If the description is not in line with your situation or feelings, please tick "√" on "1". (1= strongly disagree, 5= strongly agree).

1. I believe I have the ability to get good grades in study.
2. Compared with other students in the class, my learning ability is relatively strong.
3. I think I can grasp what the teacher teaches in class in time.
4. I think I can put what I have learned into practice.
5. I like to choose challenging study tasks.
6. When I think about a problem, I can relate what I have learned before and after.
7. When I read books, I can relate what I read to what I already know.
8. I always underline key points in my book or notebook to help with my studies.
9. When I review for an exam, I can review what I have learned before and after.
10. Even if the teacher did not require, I will consciously do each chapter of the book after the exercise to test their knowledge of the situation.

Questionnaire 3：Learning strategy scale

Answer instructions：There are 16 questions below, all of which are your attitudes towards learning and performance in campus life. Please compare the description with your actual situation and play "√" on the options that match you. Each item is a single item, please do not miss or choose more。If the description is very suitable for your situation or feelings, please tick "√" on "1"， If the description is not in line with your situation or feelings, please tick "√" on "5". (1= strongly agree, 5= strongly disagree).

1. Concentrate on class.
2. Pre-study on the new content to be learned before class.
3. After class, review the knowledge content learned on the day and consolidate what you have learned.
4. When learning new concepts, often compare and analyze the relevant knowledge and concepts that have been learned.
5. Often summarize what you have learned to help you remember.
6. Be good at taking notes in class and organizing notes after class.
7. When the academic performance drops, you can calmly analyze the reasons and take effective measures to catch up as soon as possible.
8. When learning difficulties, it will adjust the learning method in time.
9. Frequently analyze and summarize recent learning progress.
10. Often summarize your own methods and experience in learning.
11. After a period of time, I like to recall how the learning situation during this time.
12. I often check with my classmates to check my own learning methods and efficiency.
13. Be able to use your time effectively.
14. Have a regular life and form your own schedule.
15. Good at choosing good teachers and friends.
16. When the learning environment is noisy, you will choose a different place.