Psychological Mechanism and Countermeasures of High School Students' Deviation from Subjects—Research Based on Goal Orientation Theory

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Abstract. The issue of students' subject bias has attracted widespread attention in high school teaching. Currently, researchers have conducted in-depth research on the reasons for students' subject bias, but there is still little analysis from the perspective of student goal orientation. Therefore, this study adopts the inductive method to study the literature related to goal orientation theory, an analysis was conducted on the relationship between student goal orientation and subject bias based on various academic theories. Research finds that different environmental and psychological factors can affect students' choices of internal and external driving forces, thereby affecting their goal choices, while tasks of different difficulty can also affect students' tendency to avoid. Ultimately, students' goal orientation choices will affect learning outcomes. In high school teaching, educators should pay attention to guiding students towards goal orientation, designing learning difficulties based on students' learning abilities, in order to achieve good teaching results.

1 Introduction

1.1 Research background

Subject bias, often referred to as "professional bias" or "tend to go overboard on one or some subjects". Students in partial subjects devote more time to certain areas and get better grades, but to some extent it will neglect learning in other areas. In secondary education in China today, there is a widespread phenomenon of subject bias among students, the academic community has a long history of research on the problem of subject bias, but there is always no suitable way to solve the problem of subject bias. In Chinese secondary education, the phenomenon of subject bias has not been effectively improved. The phenomenon of leaning towards subjects is common in daily life and learning from elementary school to university. The problem of subject bias in high school is more severe in students' learning careers compared to other stages, at the same time the proportion of students who specialize is also relatively high in certain subjects. For example, the survey of Harbin Normal University Affiliated High School showed a common phenomenon of leaning towards subjects (including minor biases), among them, the overall proportion of science-oriented subjects reached 49.50%, while the proportion of humanities-oriented subjects reached 61.84% [1].

Subject bias generally refers to one or several subjects with particularly good or average grades in the study of campus cultural courses in research, extremely poor or relatively poor grades in other subjects. Subject bias may be beneficial in certain aspects, for example, in some professional disciplines and fields, centralized investment may achieve better results. But as of now, the problems caused by the phenomenon of subject bias bring more harm in the study and life of high school. Subject bias can limit individuals' knowledge breadth and interdisciplinary understanding abilities, even affecting students' innovation ability. More importantly, students who do not receive positive feedback on certain subjects for a long time may experience helplessness and may give up related studies in severe cases. Scholar Chenglong Fan pointed out that the long-term lack of positive feedback not only affects academic performance and reduced self-efficacy, but also caused psychological inferiority and self-denial among students, which is detrimental to their personality and overall development [2].

Therefore, it is necessary to study the causes and formation logic of high school students' academic biases and propose corresponding solutions for the growth of high school students' learning.

1.2 Research review

The goal-oriented theory, also known as the achievement goal theory, refers to an individual's understanding of the goals or reasons for engaging in academic achievement tasks [3]. Students will set different achievement goals
according to their abilities, there are two categories according to whether the ability can increase with age and skill: Master the goals (some people believe that competence can be improved, they prefer to learn new things and improve their abilities) and performance goals (this kind of people think it is impossible to improve abilities, they prefer to pay attention to comments from others) [4]. Later, researchers combined the two motivations of approaching and avoidance, achievement goal is divided into four types: Master approaching the goal (master the goal and acquire knowledge); Master avoidance targets (avoid tasks that are not completed or mastered); performance approaching the target (display their abilities); performance avoidance of targets (avoid being bad in front of others) [5,6].

The comfort zone theory has many similarities with Vygotsky's theory of "recent development zones", in the three-circle theory of comfort zone, people in the comfort zone are very familiar with the things within the comfort zone and have good driving ability. Generally speaking, within this range, people can learn very little and progress slowly. This corresponds to the knowledge and abilities that students in Vygotsky's recent development zone theory have mastered. The "challenge zone" in the comfort zone theory is similar to the "intermediate zone" proposed in the recent development zone, which refers to the range that students can master after efforts and challenges. The last, the anxiety zone represents skills and knowledge that students are temporarily unable to learn through hard work. Among them, the zone of proximal development theory mainly explains the logic of students absorbing new knowledge under the guidance of teachers, while the comfort zone theory tends to explain that students have different psychological states and reactions when facing knowledge with different difficulties and ranges. The largest difference between them is that the near development zone emphasizes the importance of teaching in expanding the development zone in learning, while the comfort zone tends to explain the process of self-learning. The recent development zone is currently widely used in subject education, such as evaluating students' knowledge level in physics teaching and formulating teaching plans [7].

2 Research methods

2.1. Research design

This study analyzes the literature and research on high school students' subject bias. By using the way and using theories such as goal orientation theory, comfort zone theory, and the zone of proximal development, it classifies and analyzes students' subject bias and their learning behavior after experiencing leaning towards subjects. It aims to investigate the possible psychological mechanisms behind high school students' leaning towards subjects. For various types of students, the first step is to explain their behavioral logic, with a focus on revealing the obstacles and coping mechanisms that students with subject bias may encounter during the learning process. Relevant theories are used to analyze the difficulties of the problem and propose possible solutions.

Research framework: Under the influence of various factors in the high school learning environment, students may develop various learning behavior patterns based on their parents and their own abilities to cope with the difficulties they face. Among them, students who set mastery goals are more likely to improve themselves, improve their abilities or skills, and be able to excel in relatively difficult subjects through their own efforts. However, students who set performance goals make themselves better at their subjects, making it easier to give up and avoid difficult subjects when facing academic difficulties.

2.2 Principles of literature selection

The literature selected for this study is mainly related to the behavior and psychology of students who are subject bias, mainly covering journals, master's and doctoral dissertations, and some newspapers. It comprehensively analyzes the environment, psychological state, behavior, and causes of students' biases towards subjects in high school education. The issue of subject bias has a long history, and the time difference between the college entrance examination system and the middle school environment is relatively small. The academic community's views on subject bias are relatively stable. Therefore, in terms of theoretical research, literature from around the past decade is mainly selected, while cases are selected from content from the past five to three years to comply with the current change in the situation. In terms of theory, the literature content involves research on goal orientation theory, learning motivation, and learning expectations in teaching. In terms of previous research selection, the main focus is on the systematic questionnaire and experimental survey of current academic circles on biased subjects, as well as some individual interviews.

Since this study mainly involves Chinese high school students with a bias towards certain subjects, we selected domestic CNKI databases for retrieval based on quantitative research data such as survey questionnaires, and selected CNKI databases and some Google academic and SCI journals for theoretical research.

2.3 Description of the selected literature

This study selected a total of 11 journal-related literature. As this study focuses on the theoretical direction of high school students' biased behavior, it will focus on selecting qualitative research papers. In terms of literature selection, there is a total of 8 qualitative studies, and 3 quantitative studies.

2.4 Literature analysis methods
This study adopts the inductive method to first understand the situation of high school students' subject bias, summarize the key points of high school students' subject bias, in order to identify the common difficult subjects and psychological mechanisms of students at present. Secondly, in response to the phenomenon of high school students deviating from subjects, combined with theories such as the zone of proximal development, and based on the learning of goal-oriented theory, the psychological mechanism of students deviating from subjects is analyzed. Finally, based on existing viewpoints in the academic community, propose possible solutions to students' biased behavior.

3 Review of academic research

3.1 Research theme

Currently, there are a total of 444 papers studying the phenomenon of biased subjects in secondary education in the CNKI database. It mainly emerged in 1988, and by 2004, the phenomenon of deviating from science began to receive attention from the academic community, with literature mainly concentrated around 2006-2022. The main theme distributions are biased students, biased phenomena, biased subjects, and middle school students. There are a total of 194 articles on goal orientation theory, which were distributed annually from 1992 to 2022. Among them, it began to rise in 2002, and there were many studies on goal orientation theory from 2004 to 2022. However, 102 of them were about the application of goal orientation theory in the field of physical education, with only 16 articles in the field of secondary education. There are many studies on the recent development zone, with a total of 4198 papers, 2247 of which are in the field of secondary education research, concentrated from 2004 to 2022.

3.2 Research object

At present, the research on interdisciplinary behavior in China mainly focuses on the secondary education stage, with some involving primary and higher education. The research subjects are mainly distributed in two branches: science and humanities. Among them, the focus of research is mainly on single subjects, such as English, Chinese, mathematics, physics, chemistry, and other single subjects. The main research population is middle school students in public high schools, involving some educational personnel such as teachers. In the theory of goal orientation, the main research direction in the academic community is the application of goal orientation theory in physical education teaching, with a small portion applied to other disciplines, such as English teaching, using the principles of goal orientation theory to design classroom teaching [8].

3.3 Research method

For students who are subject-biased, some scholars have collected the results of the secondary school unified test and graded them according to the results of each subject. For example, the top 10% are listed as Grade 1, 10%-30% are listed as grade 2, 30%-70% are grade 3, 70%-90% are grade 4, and the last 10% are grade 5, calculate the level difference between the best subject and the worst subject for students, with a difference of 2, 3, and 4 levels being slightly biased, severely biased, and very severely biased, and calculate the proportion of biased students [1]. On the one hand, some scholars conducted a survey and research on all students and some teachers of Yichun Middle School, distributing 500 questionnaires, with an effective rate of 98%. It mainly investigated students' preferences for the subject, social views, teacher factors, and family factors [9]. On the other hand, some scholars have summarized the principles of biased phenomena, such as using the S-E-R emotional conditioning principle to analyze students' biased phenomena [10]. At present, the academic community rarely uses goal-oriented theory to analyze students’ bias towards subjects. Recently, there has been a lot of research on the development zone theory for students' single subject learning.

4 Discussions

4.1 Current academic research conclusions

Currently, the academic community mainly focuses on interest to explain why these high school students have subject bias. Some scholars like Qu Liuying pointed out that it may be related to Emotional Conditioning Reflex Principle. And also, the environment and personal psychological factors contribute to these students’ discipline preferences and aversion [10]. And former studies also revealed that subject bias had strong relations to student’s interests. It is also considered that factors like students’ minds, teachers, families and social environments [9].

While the academic community has some understandings of the reasons, there is a lack of research on the learning logic of students’ goal-oriented choices during the learning process, especially in terms of its macro connections. Currently, goal orientation theory is mainly mentioned in the PE lesson teaching methods and is used less to explain the psychological mechanisms of students who have subject bias.

4.2 Discussion and summary of topic selection based on current research

Based on issue of subject bias among high school students, this study mainly researched relevant literature related to high school students. The study investigated the psychological mechanisms of high school students’ subject bias, based on Goal Orientation Theory, Comfort Zone Theory, Expectancy Theory and Zone of Proximal Development (Vygotsky).
The author believes that, in the process of learning, the students will face various external factors. The setting of learning difficulty, psychological states and parents’ and students’ learning expectations influence the choice of the students’ goal orientations, in turn, impact their academic performance and the phenomenon of subject bias. Research nowadays reveals that with the different goal orientations, the students have different acts to their subject biases. The students who take mastery goals tend to face difficulties directly, and learn harder to master some techniques, while the students who take performance objectives are likely to choose some tasks to show their ability to others. In educational psychology, based on students’ approach and avoidance motivations, the categorization becomes more detailed: mastery-approach goals, mastery-avoidance goals, performance-approach goals, and performance-avoidance goals.

In high school learning, many factors may influence the students’ study target choices. The external factors like parents’ and teacher’s expectations, social stereotypes mainly affect students’ intrinsic motivation. Also, they have an impact on students’ perceptions of grades. If they rely on external motivations, such as others’ praise and material rewards, they tend to have performance goals. If students rely on internal motivation, like simply want to strengthen themselves, they may have mastery goals. When it comes to the students who have mastery goals, they are more likely to have better performance. Because they are not count on comparing with others, nor external rewards. In China, high school students are facing college entrance examination, which is significant to their future careers. This contributes the students putting much significance on the examination score. Also, they are more likely to compare their exam scores with others because they must beat others to avoid being knocked out and entering the universities. This contributes them to taking a performance guide goal, which means they tend to motivate themselves by some external motivations like beating others with score or teachers’ praises. When teaching, if the degree of difficulty is reasonable, and they are in their comfort zone or challenging zone, they could have great performance and be willing to showcase their abilities in areas where they excel.

While, regarding the fact that different students have different capacities for grasping knowledge, when they face difficulties, they may try to avoid putting themselves into a situation of low competence and receive low evaluations. However, if they spend much time but cannot overcome these challenges or realize that the difficulty of what they are learning suddenly rises beyond their comfort zone, they are likely to feel anxious. At the same time, this means that they could hardly to receive positive feedbacks. Over time, after losing their external motivations, they are likely to fall into negative emotions. Self-Efficacy Theory also supports the idea, suggesting that when the students do not receive positive evaluations over the long term, they can fall into negative emotions. The theory explains the negative avoidance behavior exhibited by students when they face long-term difficulties.

4.3 Research suggestions and insights

As the main frame of this study, research based on the current direction of goal orientation theory is limited. The present study suggests that the academic community could do more research on this theory, particularly having direct studies on various environmental factors and curriculum difficulty design and their influence on high school students’ choice of goal orientation. By researching and summarizing the impact of factors on high school students, a deeper understanding of student learning response mechanisms can be gained. That allows for dynamic adjustment to the curriculum during the teaching process to fit students’ learning process.

4.4 Countermeasures

The author considers that in the teaching, factors influencing students’ goal orientation should be focused. Teachers’ and parents’ expectations are likely to affect students’ views of performance. Hence, in the teaching, teachers shall help students connect their learning and reality application, avoiding students from only relying on external motivation and shifting towards a performance-oriented mindset.

When it comes to the difficulty of curriculum, the author thinks that too difficult knowledge may contribute to students feeling lack positive feedbacks. This may allow them to tend to avoidance goals. Instead, appropriate difficulty level can provide students with more positive feedback, making them more inclined towards a performance-oriented approach. Hence, teachers shall take students’ ability and knowledge level into consider, integrating the theory of Zone of Proximal Development, progressively advancing teaching by breaking down knowledge challenges, preventing students from getting trapped in study anxious.

Moreover, the mental supports from teachers are important too. According to scholars Han Huilei and Wu Yipeng, their research points out that after receiving a period of psychological support, the students’ chemistry grades have shown a noticeable improvement [11]. According to this, the author considers that with timely and targeted positive encouragement and feedback, the students turned from a performance-oriented mindset. So, students are more willing to learn and receive better evaluations.

Certainly, after building students’ learning confidence, it is more significant to guide students to recognize the importance of holistic development, and each subject should not solely be seen as tools for competition. For this reason, in the teaching, instructors should combine with practice and weaken competitive attributes of learning. Also, tutors should make students recognize the importance of practice. With employing methods such as classroom activities, it is possible to enhance students’ self-efficacy and real-world connections. By doing this, students could clear their learning objectives, and enable them to gain benefits beyond academic achievement, contributing them to
shift from a goal-oriented mindset to a mastery-oriented mindset.

4.5 Research prospect

This study researched the subject bias phenomenon based on different theories of educational theory. The author hopes that in the future, based on these theories, there can be an analysis of the psychological mechanisms of students when they exhibit a subject bias. This may help analyze high school students’ learning and guide teachers in their instructional efforts, promoting research in education and teaching.

5 Conclusion

This research integrates multiple educational theories, with a primary focus on the goal-oriented theory as the main framework. It discusses the impact of goal-oriented choices on students’ learning methods and performance. This paper employs a literature review methodology to investigate the factors contributes to subject bias in high school students’ study. It also examines the mediating roles of some theories such as Zone of Proximal Development (ZPD), Comfort Zone Theory in high school students' subject-specific imbalances. The author believes that the factors contributing to subject bias among high school students are mainly the result of environmental factors, teaching strategies and difficulty levels. Environmental factors, such as social perceptions, students’ personal views on grades, and teacher guidance, influence the direction students subconsciously choose between performance-oriented and mastery-oriented goal orientations. Furthermore, the challenge level influenced students’ learning attitudes, leading to tendencies of approaching or avoiding mindsets. Based on high school learning circumstance and the aim of the college entrance examination, students are more likely to choose performance-avoidance goals.

This study has certain limitations, especially in the selection of literature, as the current academic research on goal orientation theory is narrow. There is a lack of sufficient research samples and experiments based on goal orientation theory, making it difficult to propose targeted solutions in greater depth. Therefore, the authors call for more quantitative research based on the goal orientation theory to figure out the factors influencing students’ subject bias in the future.

References

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