THE FACTORS AFFECTING AUTONOMOUS LEARNING OF COLLEGE STUDENTS IN DAZHOU CITY, CHINA

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Abstract This study investigates the factors affecting autonomous learning of college students in Dazhou City, with a particular focus on five predictors: learning outcomes, learning motivation level, learning engagement, self regulatory ability, and learning satisfaction. The target population consisted of college students, from which 296 valid responses were obtained. A structured questionnaire with 60 items was developed to measure the five core variables. Content validity was evaluated by five experts using the Index of Item-Objective Congruence (IOC), with all items achieving scores between 0.8 and 1.00. Reliability analysis confirmed high internal consistency, as Cronbach's Alpha coefficients were between 0.925 and 0.936. Data were collected using both online and paper-based formats to maximize participation, while ethical procedures ensured confidentiality and anonymity. The collected responses were analyzed using descriptive statistics, Pearson's correlation, and multiple regression analysis. Data normality was confirmed, as skewness and kurtosis values remained within acceptable thresholds. The findings revealed were as follow:

The study revealed that college students reported moderate to high levels across learning outcomes ($\bar{x}$=3.52, s.d.=0.88), learning motivation level ($\bar{x}$=3.47, s.d.=0.92), learning engagement ($\bar{x}$=3.46, s.d.=0.89), self regulatory ability ($\bar{x}$=3.42, s.d.=0.95), learning satisfaction ($\bar{x}$=3.49, s.d.=0.93), and autonomous learning ($\bar{x}$=3.49, s.d.=0.90), reflecting general acceptance with noticeable gaps for improvement. Item-level analysis indicated that students expressed the highest satisfaction with learning outcomes, while self regulatory ability received the lowest ratings. Correlation analysis confirmed significant positive associations between all five predictors and autonomous learning, with coefficients ranging from r=0.435 for learning motivation level to r=0.738 for learning satisfaction. Regression analysis further validated that learning outcomes (β=0.336, $p<0.01$), learning motivation level (β=0.247, $p<0.05$), learning engagement (β=0.301, $p<0.05$), self regulatory ability (β=0.394, $p<0.01$), and learning satisfaction (β=0.426, $p<0.01$) significantly influenced students' autonomous learning, jointly explaining 64.2% of the variance (R^2=0.642). Among these, learning satisfaction and self regulatory ability emerged as the most influential drivers, while learning motivation level played a weaker but still meaningful role.

Keywords: Learning outcomes, Learning motivation level, Learning engagement, Self regulatory ability, Learning satisfaction.

1. INTRODUCTION

Against the backdrop of rapid technological advancement and ever-changing social culture, the knowledge imparted by schools can no longer meet the needs of students' individual growth, making lifelong learning and autonomous learning an inevitable trend. China places great emphasis on building a learning society, with the 20th National Congress Report of the Party highlighting the digital transformation of education, striving to foster a nationwide trend of lifelong learning and considering it a crucial pathway to achieving the goal of becoming a modernized powerhouse. The year 2025 is pivotal for implementing the spirit of the National

Education Conference and executing the Outline of the Plan for Building an Education Power, marking the conclusion of the 14th Five-Year Plan and the planning phase of the

15th Five-Year Plan. It also signifies a year of comprehensive strategy and high-level advancement in building an education power within a decade. The aim is to accelerate the process of building a learning-oriented nation. Under these circumstances, the college student population possesses distinct advantages in promoting the concept of lifelong learning. Autonomous learning ability is both a key component of cultivating innovative talents in higher education and a critical foundation for improving personal continuous development. The rapid advancement of information technology drives ongoing innovation in higher education, expanding autonomous learning beyond mere knowledge accumulation. Learners must comprehensively evaluate and refine their learning methods, continuously adjust strategies through feedback to achieve desired outcomes. Once specific learning goals are established, they can actively pursue them to attain predefined results. Under such goal-oriented and contextually constrained conditions, cognitive development, intrinsic motivation, and behavioral improvement generate synergistic effects (Jiang, 2025). Although educational reforms have established institutional support for autonomous learning, past literature indicates that students' progress in this area still faces numerous obstacles. Personal internal factors, school environment factors, and social environment factors play significant roles in this process, reflecting a complex and diverse interplay of influences. Personal internal factors include learning motivation, which constitutes a critical psychological factor determining whether students can sustain engagement (Wang, 2024). Current research suggests that students' autonomous learning abilities vary significantly across different task types. While most can achieve good results in short-term tasks, they often exhibit notable deficiencies in self-regulation when dealing with long-term, highly uncertain, and complex tasks. This indicates that students' current level of autonomous learning remains relatively low, unable to adapt to changing problems or maintain their motivational state. From the perspective of applied talent cultivation, this situation still falls short of societal needs (Fan et al., 2025).

Research questions

What are the factors affecting the autonomous learning of college students, in Dazhou City ?

Research objectives

To identify the key factors affecting the autonomous learning of college students in Dazhou City.

Research hypotheses

H1: Learning outcomes have affecting autonomous learning of college students.

H2: Learning motivation level have affecting autonomous learning of college students.

H3: Learning engagement have affecting autonomous learning of college students..

H4: Self regulatory ability have affecting autonomous learning of college students..

H5: Learning satisfaction have affecting autonomous learning of college students.

Related research

1. Taking online courses at a certain university as an example(Liu ,2024) , some studies analyzed the internal and external factors affecting the quality of online courses through questionnaire surveys to monitor the operation status of online courses; evaluated the teaching quality of online courses and conducted evaluation, tracking, and feedback on teaching effects through student questionnaires and other methods; through four semesters of empirical research, continuously enriched learning resources, improved instructional design, reformed teaching methods, and continuously improved the internal and external environment of online courses, resulting in a significant improvement in students' learning outcomes in online courses.

2.The study focuses on college students who have had self-directed learning experience in the past six months. Firstly, the research results and relevant theoretical basis on self-directed learning and information search behavior at home and abroad were sorted out, and theoretical analysis was conducted based on the characteristics of information search behavior in college students' self- directed

learning. Then, after sorting and summarizing, the variables of this study were summarized as metacognition, self- efficacy, search term construction ability, self- directed learning ability, learning environment, and information sources, and a conceptual model of the influencing factors of information search behavior in self- directed learning was established (He, 2024). Finally, by analyzing the data collected from the questionnaire survey, the hypotheses were validated and conclusions were drawn using data analysis methods such as factor analysis, correlation analysis, and regression analysis. By studying the influencing factors of college students' self- directed learning information search behavior, integrating existing concepts, further optimizing college students' information search behavior, and providing suggestions for improving information search ability from multiple perspectives.

3. Construct a research model that includes five influencing factors: perceived ease of use of technology, external learning environment, self- efficacy, learning motivation, and learning strategies. A research questionnaire was developed using a questionnaire survey method, with some college students participating in blended learning in S city as the research subjects. A total of 405 valid survey questionnaires were collected. The research results showed that in a blended learning environment, the perceived ease of use of technology significantly positively affects self- efficacy, learning motivation, learning strategies, and self-directed learning ability (Wu et al., 2024). In a blended learning environment, the external learning environment significantly positively influences self-efficacy, learning motivation, learning strategies, and self-directed learning ability. In a blended learning environment, self-efficacy, learning motivation, and learning strategies all have a significant positive impact on self-directed learning ability.

4.A study selected 174 non-English major college students from a vocational college as research subjects (Rui ,2022), adopting research methods such as questionnaire surveys, learner logs, and interviews to explore the relationship between learners' online English learning and self regulatory ability, i.e., how learners with different characteristics use self regulatory ability to participate in online English classroom learning. The results showed that students' self regulatory ability varied, and some students had poor self regulatory ability in online course learning. Moreover, students' self regulatory ability exhibited significant differences in the three dimensions of planning, behavior, and reflection, as well as in each component. After a sixteen- week teaching experiment, learners' self regulatory ability was improved. The pre- test scores of the questionnaire were significantly lower than the post-test scores, and the frequency of students' use of the two dimensions of task strategies and self-evaluation increased significantly.

5. A study analyzed six factors influencing college students' learning satisfaction with group collaborative learning in an online learning environment(Liao & Li,2023) , designed a questionnaire, and proposed research hypotheses. Through validity testing and linear regression analysis, it was verified that learner characteristics, collaborative attitude, social presence, learning effectiveness, and technical environment had a high significance with learning satisfaction, while instructional design had a relatively insufficient impact.

6.Another study discussed the possibility and specific teaching strategies of constructing an autonomous learning model in high school physics teaching (Liu ,2022) , and deeply analyzed how to cultivate students' autonomous learning ability, so as to provide some help for improving classroom efficiency, changing teaching concepts, and transforming students' learning methods. Quality- oriented education requires students to learn how to learn and take the initiative to learn, which is also the requirement of the times for talents. Therefore, cultivating students' autonomous learning ability is particularly important. Teachers should attach importance to the construction of the autonomous learning model in high school physics teaching, highlight the dominant position of students, and help them achieve learning goals by guiding them to analyze and explore independently.

Conceptual framework

Dependent variables: autonomous learning

Independent variables: learning outcomes 、 learning motivation level 、 learning engagement、self regulatory ability、 learning satisfaction

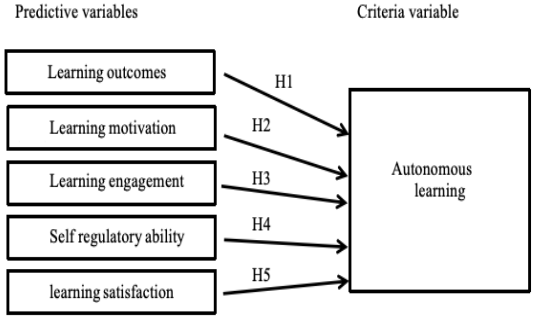

Figure Conceptual Framework

2. MATERIALS AND METHODS

Research design

1. This study primarily analyzes the impact of learning outcomes, learning motivation level, learning engagement, self regulatory ability, learning satisfaction on autonomous learning, beginning with the collection of relevant research data and literature on these factors.

2. Next, prepare relevant documents for research feasibility and develop scales for related factors.

3. Distribute questionnaires online to collect relevant data, facilitating subsequent research and data analysis.

4. Conduct the necessary analysis on the collected data to derive research findings, and provide relevant recommendations based on the results.

5.In this study, five predictive variables and one standard variable are included: 1. learning outcomes2. learning motivation level3. learning engagement4. self regulatory ability5. learning satisfaction. 6. Autonomous learning (criterion variable)

6.All five variables were measured using a structured questionnaire. Each variable consisted of 10 items, for a total of 60 items. The questionnaire adopted a five-point Likert scale, with the following response options: "very little" (1), "little" (2), "middle" (3), "high" (4), and "very high" (5). Higher scores indicate a greater degree of agreement with the statement, and therefore a higher perceived level of the measured construct.

Research sample

The overall research population of this study is 1139 full- time college students, covering multiple professional fields, ensuring that the research subjects have broad representativeness. In order to balance the scientific and feasibility of the research, based on the principle of random sampling, 296 students were selected from the population as the core research sample. The sample size meets the basic requirements of relevant statistical analysis in social science research, objectively presenting the overall situation of college students' autonomous learning and laying a solid empirical foundation for further in-depth analysis of the mechanisms of various influencing factors.

Data collection

1. This study adopts a systematic literature search method to comprehensively collect various types of information such as relevant policy documents at the school and departmental levels, in order to establish the theoretical foundation of the system.

2. Implementation of questionnaire survey: This study adopts random sampling and selects a corresponding number of students to participate in the research work according to the established plan. This study intends to select 296 college students as research subjects.

3. This study adopts a mixed survey method that combines online (using the Wenjuanxing platform) and offline (distributing paper questionnaires in class). This not only expands the scope of the sample, but also greatly improves the speed of data collection, effectively enhancing the overall research level. Provide a detailed description of the research objectives, anonymity protection measures, and data security at the beginning of the questionnaire.

Data analysis

1.Before data analysis, it is necessary to systematically clean, transform, and organize the collected raw data. Exclude invalid sample data, use series mean or regression imputation method to process a small number of randomly

missing values, and directly remove large-scale missing questionnaires. And systematically collect or import various quantitative data, which can be achieved through the functional modules provided by statistical analysis software packages. The data analysis tool used in this study is SPSS.

2. According to the statistical criteria for questionnaire design, it is necessary to calculate the total score or mean of each dimension of self-directed learning ability and influencing factors separately.

3. Conduct descriptive statistical analysis to obtain basic attribute information of the sample, with a focus on the frequency distribution and proportion of key variables such as gender and grade. This can not only reflect the basic characteristics of the research object, but also evaluate whether the sample is representative and applicable.

4. This study uses descriptive statistics to calculate key values such as mean, standard deviation, skewness, and kurtosis of each variable, in order to comprehensively reflect the approximate distribution and important attribute status of the sample data.

5. Conduct correlation analysis and regression analysis to understand the relationship between self-directed learning ability and learning outcomes, learning motivation level, learning engagement, self-regulation ability, learning satisfaction, as well as the relationships between various factors. Regression analysis is used to identify variables that affect self-directed learning ability and compare the degree of influence of different variables.

3. Results and Discussion

3.1ANALYSIS OF DATA DISTRIBUTION CHARACTERISTICS

Table 3.1 Mean, standard deviation, skewness, and kurtosis of factors affecting autonomous learning of college students in Dazhou City

Factors	x̄	s.d.	Skewness	Kurtosis
learning outcomes	3.52	0.88	-1.10	-0.23
Learning motivation level	3.47	0.92	-0.93	-0.15
Learning engagement	3.46	0.89	-1.05	-0.08
Self regulatory ability	3.42	0.95	-0.92	-0.33
learning satisfaction	3.49	0.93	-0.93	-0.31
Autonomous learning	3.49	0.90	-0.88	-0.25

1. learning outcomes: The overall average level of learning outcomes is 3.52, which falls in the upper-middle range.

2. Learning motivation level: The average score of students' learning motivation is 3.47, slightly lower than that of learning outcomes.

3. Learning engagement: The mean score of learning engagement is 3.46, which is close to the level of learning motivation, indicating a good overall participation.

4. Self regulatory ability: The average score of self-regulatory ability is 3.42, which is at a medium level among all factors.

5. learning satisfaction: The mean score of learning satisfaction is 3.49, higher than that of self- regulatory ability, suggesting that students are relatively satisfied with their learning experience.

6. Autonomous learning: The average score of autonomous learning is the same as that of learning satisfaction (3.49), reflecting that students have a certain sense of autonomous learning.

3.2 ANALYSIS OF INFLUENCING FACTORS

Table 3. 2 Analysis of factors affecting autonomous learning of college students in Dazhou City, correlation

No	Hypothesis	Correlation	Meaning
1	H1	0.615	Support
2	H2	0.435	Support
3	H3	0.543	Support
4	H4	0.672	Support
5	H5	0.738	Support

Table 3. 2 presents the correlation coefficients between each influencing factor and the autonomous learning mode. All correlation coefficients are positive and range from 0. 435 to 0. 738, indicating significant positive correlations.

Specifically, the correlation coefficient for H5 is the highest at 0. 738, showing the strongest positive relationship. H1 follows with 0.615, H4with 0.672, H3 with 0.543, and H2 has the lowest correlation coefficient at 0. 435, representing the weakest positive relationship.

Overall, all five hypotheses are supported by the correlation analysis, demonstrating that each factor is positively and significantly associated with the autonomous learning mode.

4. Conclusion

4.1 VARIABLE DISCUSSION

1. Learning outcomes ($\bar{x}$ = 3.52) has the highest average value among all variables, with the highest score observed in the item "My learning outcomes often receive positive evaluations", which reflects students' high recognition of their own abilities and academic achievements. The relatively low scores of "I am able to continuously follow up on the forefront of academic trends and understand their value" (3.43) and "I have achieved good results in professional competitions or projects" (3.44) indicate that students still have room for improvement in exploring academic frontiers and participating in competitive practices.

2. Self regulatory ability ($\bar{x}$ = 3.42) is the lowest among all core variables, reflecting the sample's relatively weak performance in self-management and learning adjustment. The highest score is found in "I can allocate my time reasonably to deal with multitasking learning" (3.50), indicating that students perform well in time management. The lowest scores are observed in "I can stick to long-term goals without being affected by short-term interference" (3.38) and "I am still able to complete learning tasks well even when my emotions fluctuate" (3.39), which reveals obvious shortcomings in students' goal persistence and emotional regulation.

3. Learning satisfaction ($\bar{x}$ = 3.49) reaches its peak in the item "I am satisfied with my current learning status" (3.54), reflecting a high level of student recognition of their learning status, available resources, and overall university experience. The relatively low scores of "I believe that the current learning mode is conducive to personal long-term development" (3.43) and "I am satisfied with the speed of my academic progress" (3.44) suggest that students hold reservations about the long-term value of the current learning model and their own academic progress rate.

4. Learning motivation level ($\bar{x}$ = 3.47) is primarily driven by the item "I aspire to achieve personal growth through in-depth learning" (3.47), indicating that students' desire for self-growth and immersive learning experiences are the main sources of motivation. The items "I believe that learning is an important way to enhance self-worth" (3.44) and "The recognition or encouragement of others will enhance my learning motivation" (3.44) receive relatively low scores, reflecting students' insufficient sensitivity to value recognition and external motivational factors in learning.

5. Learning engagement ($\bar{x}$ = 3.46) is strongest in the item "I dedicate a fixed amount of time to extracurricular learning every day" (3.51), which shows that students perform well in terms of time investment and resistance to distractions. The relatively low scores of "I can maintain a regular learning pace for a long time" (3.41) and "I can stay highly focused throughout the class" (3.36) indicate that students still need to strengthen their long-term learning persistence and in-class concentration.

6. Autonomous learning ($\bar{x}$ = 3.49) demonstrates the highest level in the item "I will actively seek materials outside of textbooks to expand my knowledge" (3.56), reflecting students' strong initiative in knowledge expansion and resource acquisition. The lowest score appears in "I often independently develop both long-term and short-term study plans" (3.35), suggesting that there is room for improvement in students' systematic learning planning and goal-setting abilities.

4.2 CONCLUSION DISCUSSION

1. To further improve learning outcomes and enhance self regulatory ability(Wan et al. ,2022) , it is necessary to establish students'

autonomous learning portfolios for comprehensive and effective monitoring of the learning process, and to introduce a diversified teaching evaluation system with emphasis on process evaluation.

Therefore, H1: Learning outcomes have a significantly positive impact on students' autonomous learning is established.

2. Learning motivation and goal setting are the main driving forces of self-directed learning, and different types of learning motivation and target types can have a significant impact on its direction and development (Li, 2024). To motivate students, it is essential to encourage them to actively participate in their personal learning plans.

Therefore, H2: Learning motivation level has a significant positive impact on students' autonomous learning is established.

3. Exploring learning engagement and its influencing factors has important theoretical and practical significance for improving learning quality and thus the training quality of high-level talents in China(Shen ,2024). Schools should enrich learning resources, create a favorable learning environment, and establish an institutional system conducive to improving students' learning engagement; teachers should improve teaching methods and communicate more with students.

Therefore, H3: Learning engagement has a significant positive impact on students' autonoous learning.

4. The ability of self-directed learning is a key element of individual comprehensive literacy(Wei, 2024), which involves many aspects such as personality traits. When exploring the status and improvement methods of self-directed learning among college students, it can enhance their understanding of self driven learning and be beneficial for forming an efficient learning system and improving academic outcomes .

Therefore,H4: Self regulatory ability has a significant positive impact on students' autonomous learning is established.

5. College students' learning satisfaction is one of the important factors comprehensively reflecting the school's educational level and has a significant impact on the development of universities(Wang,2024). The stronger the learning motivation level, the higher the learning satisfaction; the higher the learning barriers, the lower the learning satisfaction. Social relationships and the lack of curriculum relevance are factors affecting learning satisfaction.

Therefore,H5: Learning satisfaction has a significant positive impact on students' autonomous learning is established.

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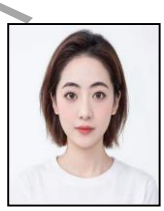

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