

A Study on the Influencing Factors and Intervention Strategies of Learning Self-efficacy among Higher Vocational College Students Based on Value-added Assessment

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Abstract:

Based on the value-added evaluation of the student's sense of learning efficacy in a vocational college, this study explores the influencing factors of the student's sense of learning efficacy and proposes corresponding intervention strategies to improve the students' sense of learning efficacy. It is found that vocational students' learning effectiveness is affected by many factors, so it is suggested that vocational colleges should continuously improve intervention methods in classroom teaching and educate students from multiple perspectives.

Keywords:

Value-added evaluation
Vocational college students
Learning efficacy
Intervention strategy

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1. Introduction

The educational concept of "student development as the center" has gradually become the core direction of education reform in the world. "Student-centered" means that the evaluation of education is no longer based on academic performance as the sole criterion but should focus on the progress and growth of students in the learning process. UNESCO states that "to be a successful member of society, students must think creatively and adapt themselves to society." This point of view puts forward

new requirements for our current education reform, so it is necessary to analyze the factors affecting students' learning effectiveness from the perspective of value-added evaluation and explore corresponding intervention strategies to establish a more scientific evaluation system.

2. Research background

Traditional examination evaluation is a kind of external evaluation that focuses on measuring the level of student's

mastery of knowledge and skills and cannot reflect the internal psychological change process experienced by students in the learning process. With the increasing demand of society for technical talents and the wide application of information, networks and intelligent technology in the field of education, the traditional evaluation system based on examination scores as the only standard has become more and more unsuitable for the new requirements of talent training put forward by society. Therefore, ways to promote the individualized development of students and improve the quality of education and teaching through scientific evaluation have become a widely concerned and urgent problem in the current education field^[1-3].

From the perspective of international development trends, all countries actively promote the application of value-added evaluation in educational evaluation. The so-called value-added evaluation method is a kind of evaluation method that compares the learning results at various points in the process of students' growth and calculates the value-added value based on educational big data. In China, the Ministry of Education has long issued the "Work Plan on Promoting the Construction of Higher Vocational Education Innovation and Development Highland," proposing establishing the "academic performance + value-added evaluation" system. This system has positively encouraged the characteristics, diversification and internationalization of higher vocational colleges. Higher vocational colleges are constantly improving the quality of teaching and personnel training through value-added evaluation^[4-6].

3. Research methods

3.1. Basic Information

In this study, the value-added evaluation method was used to evaluate the learning efficacy of students from 2010 to 2015 in a higher vocational college. This method is based on educational statistical technology and mathematical models, which combine various activities experienced by students in the learning process based on students' learning performance in school to evaluate the quality of school education and teaching^[7,8]. Specifically, it is to compare the academic performance of students during the school period with the number and total number of

various activities and activities they participate in to obtain the learning effect and learning achievement of students during the school period. This study adopts the questionnaire survey method to conduct research, and the specific situation is shown in **Table 1** and **Table 2**.

Table 1. Research objects

Grade	Sex
2010	Male (11) Female (7)
2011	Male (13) Female (11)
2012	Male (13) Female (16)
2013	Male (8) Female (4)
2014	Male (14) Female (11)
2015	Male (17) Female (5)

Table 2. Questionnaire status

Quantity	Valid questionnaire	Problem design	Options
130 copies	130 copies	What factors do you think have a value-added impact on learning?	Yes () No ()
		Do different factors have different degrees of influence?	Yes () No ()
		Do these factors come from different sources?	Yes () No ()
		Are different people exposed to different factors?	Yes () No ()

3.2. Methods

First, all the questionnaire data were sorted by total score. Secondly, the first three factors are rotated separately. Finally, principal component analysis was used to extract the first three factors. Each factor represents a variable. From the various activities that students participate in during school, the various activities that they organize and participate in, and the various grades they get, it can be explained that the various activities that students experience in school and the various activities that they organize and participate in have an impact on student's academic achievement. **Table 3** provides an introduction to the first three factors.

Table 3. Introduces the first three factors

Name	Influence characterization
Academic performance	Teacher-student compatibility
Academic frustration	Students' self-management ability
Academic achievement attribution	Students learn objective factors

3.3. Modeling

This study uses multiple regression analysis to analyze the learning efficacy of students in higher vocational colleges. This method mainly builds a model, selects specific variables as dependent variables, standardizes all dependent variables, and calculates and analyzes to get the regression equation. The method is to establish a multiple linear regression model to determine the relationship between independent and dependent variables, as well as the parameters of the relationship between them. When there is a linear correlation between the independent and dependent variables, the regression equation can be obtained according to this model. Suppose there is no linear correlation between the independent and dependent variables. In that case, the linear correlation coefficient between the independent and dependent variables is used to measure the influence of the independent variable on the dependent variable. In the process of modeling, this paper takes the various activities experienced by the students in higher vocational colleges in the school to participate in various activities and organize various activities as independent variables. The fact that the school provides learning materials to the students guides and promotes their active learning as the dependent variable. The relationship between teacher and student is taken as the independent variable in academic achievement attribution^[9-11].

3.4. Result analysis

Through the analysis of variance, it is found that the first two factors significantly impact student's academic achievement. In contrast, the third factor does not significantly impact student academic achievement. It shows that teacher relationships and academic frustration are important factors affecting students' academic achievement in higher vocational colleges.

The relationship between teachers and students is mainly reflected in that harmonious learning results between teachers and students can promote students' academic achievements. Academic frustration mainly manifests when teachers provide students with sufficient, necessary and valuable learning materials and guide and promote their active learning. Academic achievement attribution mainly manifests in the campus environment that the school provides comfortable, free and conducive to students' active learning.

Based on value-added evaluation, this study uses SPSS 22.0 software to adopt three statistical methods to explore the influencing factors of vocational college students' learning efficacy. The statistical methods are shown in **Table 4**.

Table 4. Statistical methods

Name	analyze
One-way analysis of variance	$SST = \sum (x_i - \bar{x})^2$, where x_i represents each observation, \bar{x} represents the total mean, and Σ represents the sum.
T-test	$t = (x_1 - x_2) / \text{sqrt}(s_1^2/n_1 + s_2^2/n_2)$, where x_1 and x_2 are the mean values of the two samples respectively, s_1 and s_2 are the standard deviations of the two samples respectively, and n_1 and n_2 are the sample sizes of the two samples respectively.
Multiple linear regression analysis	$Y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_k x_{ki} + \mu_i$ $i = 1, 2, \dots, n$, where k is the number of explanatory variables, β_j ($j = 1, 2, \dots, k$) is called the regression coefficient

4. Influencing factors of vocational college students' learning efficacy

4.1. Academic performance

Academic performance is students' self-cognition in their studies, reflecting students' perception of their ability. For vocational students, academic performance is an important determinant of their access to higher education. According to existing research, academic performance is positively correlated with student academic achievement (learning interest, learning ability, self-evaluation, etc.) and learning ability and self-evaluation will also significantly impact student academic achievement^[12].

In this study, the academic performance of higher vocational college students mainly includes total score,

single subject score and total score ranking. The total score ranking refers to the student's overall score ranking in the class, and the single subject score ranking refers to the student's score in a certain subject. In this study, students' total and single subject scores are among the top 10–20% of the class, indicating that some students have poor academic performance.

Due to the different education and training objectives of higher vocational colleges, some vocational colleges pay attention to setting professional courses and teaching practical courses, do not have high requirements for theoretical knowledge, and pay little attention to cultivating the comprehensive quality and practical ability of higher vocational students.

Some higher vocational colleges ignore the cultivation of students' comprehensive quality and practical ability in the actual teaching process to ensure teaching quality.

4.2. Academic frustration

Academic frustration occurs when students complete a difficult learning task. Due to the interference of subjective or objective factors, their learning efficiency is reduced or even failed.

Academic frustration is one of the reasons for the low learning efficacy of higher vocational college students. In this study, 70% of the students believe that they have suffered setbacks in their studies, and when they encounter setbacks, 32% choose to "beat themselves up," and 13% choose "to talk to others."

Academic frustration can lead to students' negative emotions and affect their academic frustration and learning behavior.

- (1) It causes students to have negative emotions.

When students experience failure, the next time they encounter the same task, they think that they can't do it well or can't do it, resulting in negative emotions.

- (2) Negative emotions will make students feel depressed, helpless and lost. When students encounter academic setbacks, negative emotions will make it difficult for them to concentrate on learning and affect the efficiency and effect of learning.

- (3) It will also cause students to experience negative emotions and a lower sense of self-efficacy. Low

self-efficacy makes it easy for students to fail in their studies and to give up when they encounter setbacks.

4.3. Academic achievement attribution

Attribution refers to the thinking activities of individuals when they analyze, judge and explain behaviors and results. It is an explanation made by individuals when they encounter problems, that is, the reason for the success or failure of tasks or behaviors is attributed to internal or external factors of individuals, and it is a process of self-regulation. In learning behavior, students attribute success or failure to internal factors, such as "I don't think I am a strong learner."

Learning efficacy is students' subjective feelings about their learning ability, and students' attributions to academic achievement will have an important impact on their learning efficacy. Students with a stronger sense of learning efficacy were likelier to attribute poor grades to internal factors. In comparison, students with weaker learning efficacy were more likely to attribute poor grades to external factors. In this study, some students attributed their poor grades to internal factors, such as "I don't think I'm working hard enough" and "I don't think I'm as talented as others."

Some students attributed their poor performance to external factors, such as "the teacher is too difficult to write the questions" and "the school is not well managed." When students ascribe their academic achievement to internal factors and external factors, their level of learning efficacy is different. Students with higher self-expectations attributed their academic achievement more to internal factors. Students with lower self-expectations attributed their academic success more to external factors. This shows that higher vocational colleges should take different measures to improve their academic achievement attribution level for students of different major types.

5. Intervention strategies for learning effectiveness of vocational college students

In the traditional evaluation methods, students' learning results are the only basis for evaluation, but evaluating

students' learning efficacy is often ignored. With the development of society, people pay more attention to the growth and development of students in their studies, and the country also regards the improvement of students' comprehensive quality as one of the important educational goals. Therefore, it is necessary to analyze the factors affecting the learning efficacy of vocational college students based on value-added evaluation and put forward the corresponding intervention strategies.

5.1. Schools: People-oriented, strengthen education and teaching reform

Higher vocational colleges should adhere to the concept of "people-oriented," strengthen the reform of education and teaching, change the traditional mode of education and teaching and pay attention to cultivating students' comprehensive quality. Teachers should change their teaching methods and flexibly use a variety of teaching methods so that students can better grasp the knowledge and skills. At the same time, schools should strengthen the psychological counseling and guidance of students to help students establish an optimistic attitude. The school can carry out corresponding career planning education and guidance for students with weak learning abilities. Vocational colleges should provide students with career planning education and guidance to help students understand their abilities and interests, so that they have a clear goal and direction in study and life. Schools should also carry out a series of practical activities conducive to cultivating students' innovative consciousness and innovative ability so that students can continuously improve their comprehensive quality in practice^[13,14].

5.2. Teachers: Improve themselves and build harmonious learning results

Teachers are the main guides of students' learning activities and the main source of students' learning efficacy. Good academic performance can enhance students' trust in teachers and improve their sense of learning efficacy. Therefore, in the teaching process, teachers should emphasize establishing harmonious learning results and promoting the improvement of students' learning efficacy.

- (1) Teachers should have a good mentality and correctly understand the law of student

development. Teachers should maintain their enthusiasm and passion for education and teaching work and face their work and students with a positive, enthusiastic and cheerful attitude.

- (2) Teachers should have solid professional knowledge and professional quality, actively guide students to explore knowledge in classroom teaching and cultivate students' ability to analyze and solve problems.
- (3) Teachers should have high professional ethics and a strong sense of responsibility and strive to create harmonious equality, mutual respect and mutual trust in learning results^[15].

5.3. Family: Set an example and give positive encouragement and support

Family is the first group that students come into contact with, and its influence on students' sense of learning efficacy cannot be ignored. Parents are the first group that children come into contact with, and their words and deeds will impact children. Therefore, parents should care more about and understand the students and actively guide the students to establish correct learning motivation and academic setbacks and give full play to the role of example. At the same time, parents should communicate with their children, understand their children's difficulties in school and give appropriate help and support. For example, to care more about children in life, to help them develop good living habits, communicate with children in school and timely understand their learning difficulties. Psychological encouragement and support should be given to cultivate students' optimistic attitudes and correct and reasonable self-cognition.

5.4. Society: Strengthen publicity and create good academic achievement attribution

Under the background of rapid economic development, vocational college students are facing employment pressure and there is a certain relationship between academic performance and employment. Therefore, higher vocational colleges should use various media means to publicize the employment situation so that students understand that only with good professional skills and comprehensive quality can they stand out in the fierce competition. At the same time, schools, families and society should also strengthen

the publicity and education of vocational college students' learning efficacy, help students form correct career cognition, build self-confidence and create good academic achievement attribution. In addition, schools and society should also give vocational students more care and support in terms of funds, teachers, venues and so on. In short, only the joint efforts of many parties can create a good learning atmosphere for vocational college students and improve their learning efficacy.

6. Conclusion

To sum up, teachers should fully realize that many

factors affect the learning efficacy of students in higher vocational colleges. When conducting educational and teaching activities, teachers should constantly improve teaching methods, optimize classroom organization forms and perfect incentive mechanisms to enhance students' learning efficacy. Only in this way can vocational college students experience their ability and value in mastering knowledge and gain a sense of success and self-confidence, thus enhancing their sense of self-efficacy and forming good self-values. At the same time, it also provides a new perspective and method for higher vocational college educators to study higher vocational students' learning efficacy further.

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References

- [1] She J, 2019, A Study on the Influencing Factors and Training Strategies of Vocational College Students' Self-Efficacy in English Learning. *College English*, 2019(22): 38–39.
- [2] Ayob HH, Daleure G, Solovieva N, et al., 2023, The Effectiveness of Using Blended Learning Teaching and Learning Strategy to Develop Students' Performance at Higher Education. *Journal of Applied Research in Higher Education*, 15(3): 650–662.
- [3] Chung M, Gao Y, 2023, Online or In-Person Course? Meaningful Discussion of Learning Effectiveness and Satisfaction of Microwave Filter Design Course in Graduate Students. *IEEE Transactions on Education*, 66: 203–210.
- [4] Eric GM, Kelly LC, James CW, et al., 2023, The Effectiveness of Online Experiential Learning in a Psychiatry Clerkship. *Academic Psychiatry: The Journal of the American Association of Directors of Psychiatric Residency Training and the Association for Academic Psychiatry*, 47(2): 181–186.
- [5] Gündüz AY, Akkoyunlu B, 2020, Effectiveness of Gamification in Flipped Learning. *SAGE Open*, 10(4): 215824402097983.
- [6] Dong L, Zhao Q, Wang M, 2021, Influencing Factors and Training Strategies of Pre-School Students' Academic Self-Efficacy in Higher Vocational Colleges. *Academy*, 14(36): 62–64.
- [7] Bao Y, 2020, Analysis of Influencing Factors and Theoretical Research on Learning Self-Efficacy of Five-Year

- Vocational College Students. *Journal of Hubei Correspondence University*, 33(3): 40–42.
- [8] Wang Y, 2020, Study on Professional Course Learning Involvement and Influencing Factors of Modern Apprenticeship Students. *Chinese Out-of-School Education*, 2020(21): 98–100.
- [9] Hanifah H, Caska C, Kartikowati S, 2020, The Effectiveness of Cooperative Learning Model of NHT Type Assistance in Teaching Materials in Improving Student Learning Outcomes in Social Science Students at State Junior High School 4 Pekanbaru. *International Journal of Economic, Business and Applications*, 4(1): 18–24.
- [10] Nema P, Srivastava R, Bhalla R, et al., 2023, Impact of Social Media Distraction on Student Evaluation of Teacher Effectiveness. *International Journal of Educational Management*, 37(2): 300–313.
- [11] Nizam A, 2020, Evaluation and Improvement of the Credit Transfer Models in the Student Exchange Process. *The International Journal of Information and Learning Technology*, (1/2): 37.
- [12] Bandonu A, Bastari A, Suharyo OS, 2020, Effectiveness Naval Collaboration Flexible Learning (NCFL) Model in Increasing Learning Outcomes at the Indonesian Naval Technology College. *International Journal of Progressive Sciences and Technologies*, 23(2): 2365.
- [13] Mortimer C, 2021, Effectiveness of E-Learning to Develop the Ability to Recognize and Manage Stroke. *Journal of Paramedic Practice*, 13(5): 190–194.
- [14] Yavari H, Shishavan AJ, 2020, The Effectiveness of a Brain-Based Learning on Everyday Memory Functioning and Academic Help-Seeking of Students with Learning Disability. *Iranian Educational Research Association*, 2020(51): 2429.
- [15] Yeh SS, 2020, Educational Accountability, Value-Added Modeling, and the Origin of the Achievement Gap. *Education and Urban Society*, 52(8): 1181–1203.

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