

# Research on Strategies for Improving Learning Engagement of Growing Cadres Based on Multiple Regression Analysis

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**Abstract**—In order to improve the quality of growing cadres training, this study focuses on the intrinsic relationship between the learning engagement of growing cadres and its influencing factors, designs a military growing cadres learning engagement scale, analyzes the reliability and validity of the scale, analyzes the influence relationship between learning engagement, professional identity, school belonging and other factors, and finally constructs the structural equation model of learning engagement of growing cadres after evaluation, fitting, and correction of the hypothesis model. The results show that professional recognition is positively correlated with learning engagement. Professional identity has an indirect impact on learning investment through the mediating variable of school belonging. Based on the conclusion, corresponding optimization strategies are proposed: enhance professional identity and cultivate sense of mission honor; Focus on strong energy preparation and strengthen specialization and refinement; Revitalize training resources, optimize the efficiency of military training, and provide strong support for the building of our army's combat effectiveness.

**Keywords**—learning engagement, multiple regression analysis, professional identity, school belonging

## I. INTRODUCTION

As a basic way to cultivate military talents, military academy education plays a crucial role in military construction. Improving the quality of military education has always been a research hotspot and development trend in the field of military education. As an important predictive indicator and key factor to measure the quality of education, learning investment has received considerable attention from experts and scholars in the field [1]. Domestic and foreign scholars have conducted in-depth discussions on learning engagement from multiple perspectives and achieved some high-quality research results. However, in the field of military education, the emphasis on learning engagement is not high, and research remains at the theoretical construction level, lacking scientific and effective data support.

Professional learning, as an important task for developing students' first job competency, is closely related to their professional identity and learning engagement, and can strengthen learning motivation through a sense of school affiliation, thereby affecting their behavior. Therefore, this article intends to use multiple regression analysis to sort out the role of professional identity and school belonging in learning engagement. By conducting a questionnaire survey and data analysis on growing cadres in a military academy, it explains the relationship between professional identity, learning engagement, and school belonging, and proposes targeted strategies to enhance learning engagement. With a view to provide theoretical and practical reference for improving the quality of college education.

## II. OVERVIEW OF RELEVANT RESEARCH

### A. Characteristics of Growing Cadres

In terms of age, growing cadres come from two sources: college entrance examination students and noncommissioned officers. The average age at enrollment is 17–20 years old, and they generally have quality education experience in basic education. From the perspective of psychological maturity, growing cadres are in the transition stage from adulthood to adulthood psychologically. They generally have high self-evaluation, strong self-esteem, high sense of recognition, low frustration level, strong need for self-realization, independent self-consciousness, and a desire for self value realization. From the perspective of learning ability, the college entrance examination scores of students are generally higher than the key line of each province by about 40 points. They have strong learning ability and good learning habits, and maintain a strong entrepreneurial spirit. From the perspective of future development planning, some students have situations such as “not feeling the joy of learning”, “difficult to learn deeply”, and “mechanized learning” due to their uncertainty about the future and their unfamiliar feeling towards the army. This article focuses on the study of learning engagement among growing cadres, which has certain developmental significance.

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### B. Research Results Related to Learning Engagement

Researchers at home and abroad have not yet unified the concept of learning engagement. This article selects a more commonly used definition, namely, learning engagement is the intensity of behavioral involvement and the quality of emotional experience that students experience when starting and executing learning activities [2]. According to relevant literature review, there is a positive correlation between learners' learning engagement and their learning outcomes [3], which is also an important indicator for the evaluation of teaching quality in higher education [4]. Research on learning engagement is complex, and learners' learning engagement can be influenced by multiple factors, including external and internal factors. Studying the relationship between learning engagement and its influencing factors can be helpful in effectively promoting learners' active engagement in learning.

Professional identity refers to the emotional acceptance and recognition generated by learners based on their understanding of the subject they are learning, accompanied by positive external behavior and an inner sense of relevance. Professional identity is a subjective feeling that serves as the basis for learners to develop professional learning behaviors. Some studies have shown that its level can have an impact on learning psychology and professional ability development, and its impact runs through the entire career development of cadets. It can provide new and effective research and practical direction for the study of learning engagement of growing cadres. School belonging refers to a student's emotional, cognitive, and behavioral identification and commitment to the school they belong to. Being a member of a school can earn respect and reflect value, which is students' self feeling about whether they are important in the class, accepted, and recognized by others. The sense of belonging is the premise and foundation of self-realization in Maslow's hierarchy of needs theory. As an important learning and living environment for students, school belonging will strengthen their motivation for self-realization and even affect their behavior. Currently, there is no relevant research to practice for the group of growing cadres, so it is necessary to take professional identity and sense of school belonging as the influencing factors of learning engagement and explore the internal relationship between learning engagement and growing cadres, both theoretically and practically.

### III. RESEARCH HYPOTHESIS MODEL

This study focuses on the internal relationship between learning engagement and its influencing factors of growing cadres. Through literature review of relevant research on learning engagement, combined with the learning situation and its variables of military college students, the independent variable "Professional Identity (PI)", the intermediary variable "School Belonging (SB)", and the dependent variable "Learning Engagement (LE)" were introduced, and a research model for learning

engagement of growing cadres was constructed (see Fig. 1).

H1: Professional identity has a direct positive impact on learning engagement;

H2: School belonging plays a mediating role between professional identity and learning engagement.

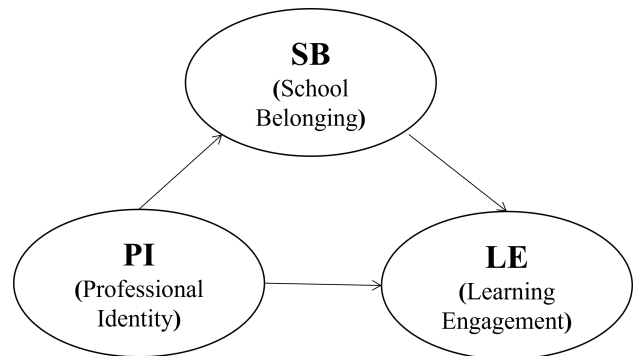


Fig. 1. Model of learning engagement of growing CADRES.

## IV. RESEARCH DESIGN

### A. Research Methods and Processes

The research process is based on a questionnaire survey and can be divided into four parts. Firstly, based on the existing research results, a "Learning Engagement Scale for Growing Cadres" was developed, and some experimental subjects were selected for trial testing. After revision, a formal scale was formed; Second, use a formal scale to conduct large-scale testing, and test the reliability and validity of the scale data; Thirdly, use *SPSS 23.0* to analyze the structural validity of various influencing factors and the total learning engagement scale; Using multiple linear regression analysis, we examined whether professional identity significantly affects learning engagement and school belonging; Fourth, use *Amos 23.0* to fit the hypothetical model of the relationship between professional identity, school belonging, and learning engagement model, test the structural model, and construct growing cadres learning engagement structural equation model; Fifth, use Bootstrap to test the mediating effect of school belonging.

### B. Measurement Tool Design

Based on the "College Student Learning Engagement Scale" developed by Li and Huang [5], the "College Student Professional Identity Questionnaire" developed by Qin [6], and the "College Student School Belonging Questionnaire" developed by Hao [7], this study comprehensively extracted 73 questions from the three scales, including learning engagement, professional identity, and school belonging, and added 9 basic information questions, resulting in a total of 82 questions in the "Growing Cadres' Learning Engagement Questionnaire". Among them, each item is scored using the Likert 5-point scale (1–5 indicates a gradual increase in the degree of agreement). After completing the questionnaire, 75 growing cadres from a military academy were selected for a trial test, and a formal scale was formed after revision.

C. Experimental Environment and Objects

In this study, a questionnaire survey was conducted in a military academy. The subjects of the study were growing cadres with 1–2 years of military academy learning experience. In addition, questions 31, 42, and 59 of the questionnaire were set as lie detection questions. A total of 268 paper questionnaires were distributed. After retrieving the questionnaire, data coding and result statistics were performed on the questionnaire. The questionnaire samples with the same answer options or inconsistent answers to the lie detection questions were deleted, and a total of 234 valid questionnaires were obtained, with an effective rate of 87.31%.

V. DATA HANDLING

A. Reliability and Validity Analysis of The Scale

The statistical results show that the value of Cronbach’s  $\alpha$  in the “Growth Cadres’ Learning Engagement Scale” is 0.981 greater than 0.70, indicating a high internal consistency reliability of the total scale [8]. An exploratory factor analysis was conducted to test the mutual exclusion among PI, LE, and SB. After calculation, the *KMO* value obtained is 0.943 and greater than 0.80, which passes the Bartlett spherical test ( $\chi^2 = 1885.046$ ,  $df = 91$ ,  $p < 0.001$ ), suitable for factor analysis [9]. From exploratory factor analysis, it can be seen that the factor load is greater than 0.50, as shown in Table I. The cumulative variance contribution rate of 14 items, including PI (6 items) and SB (8 items), was 66.530%, indicating that the two variables have a significant joint impact on learning engagement. The above research results indicate that the scale composed of LE, PI, and SI has good structural validity.

TABLE I. COMPONENT MATRIX AFTER ROTATION

Category	Composition	
	SB	PI
SB 28	0.807	–
SB 19	0.758	–
SB 24	0.749	–
SB 32	0.739	–
SB 27	0.738	–
SB 29	0.712	–
SB 9	0.692	–
SB 7	0.691	–
PI 6	–	0.840
PI 11	–	0.791
PI 12	–	0.768
PI 24	–	0.741
PI 7	–	0.739
PI 15	–	0.687

Extraction method: Principal component analysis.  
 Rotation method: Caesar Normalization Maximum Variance Method.  
 a. Rotation converged after 3 iterations.

B. Multiple Linear Regression Analysis

This study uses multiple linear regression analysis to verify the impact of PI and SB on LE. As shown in Table II, both PI and SB have a significant impact on LE ( $p < 0.01$ ), and the impact of PI and SB on LE is gradually increasing,  $\beta$ , the values are 0.236 and 0.483 respectively, indicating that the impact of SB on LE is slightly higher than that of PI. The results show that both

PI and SB have a significant impact on LE. In addition, both variables entered the regression equation ( $R^2 = 0.449$ ), which explained 44.9% of the total variance of LE, indicating that PI and SB had a certain explanatory power on the variability of LE.

TABLE II. MULTIPLE LINEAR REGRESSION ANALYSIS OF PI, SB, AND LE

Model	Unstandardized Coefficient		Standardization Coefficient	t	p	R <sup>2</sup>
	B	SE	$\beta$			
PI-tol	0.340	0.109	0.236	3.113	0.002	0.449
SB-tol	0.637	0.100	0.483	6.365	0.000	

C. Hypothesis Model Testing

This study uses *Amos 23.0* to fit the hypothetical model of the relationship between PI, SB, and LE model [10], with each fitting index shown in Table III.

TABLE III. FITTING INDEX OF STRUCTURAL EQUATION MODEL FOR THE RELATIONSHIP BETWEEN PI, SB, AND LE MODEL

Specific Indicators	Numerical Value	Adaptation Standards
$\chi^2/df$	1.843	< 3.0
RMSEA (Root mean square value of approximation error)	0.065	< 0.08
IFI	0.946	> 0.90
TLI	0.939	> 0.90
CFI (Comparison fit index)	0.945	> 0.90
PGFI (Reduced goodness of fit index)	0.700	> 0.60
GFI (Goodness of fit index)	0.851	> 0.60
AGFI (Adjusted goodness of fit index)	0.819	> 0.60

From Table III, it can be seen that the above fitting indexes are within the specified range, indicating that PI, SB, and LE model are well fitted and have passed validation.

To test the learning engagement structure model of growing cadres, set the sampling sample number of Bootstrap to 5000 rows in *Smart PLS 3.0*. The test results of the learning engagement model of growing cadres are shown in Fig. 2.

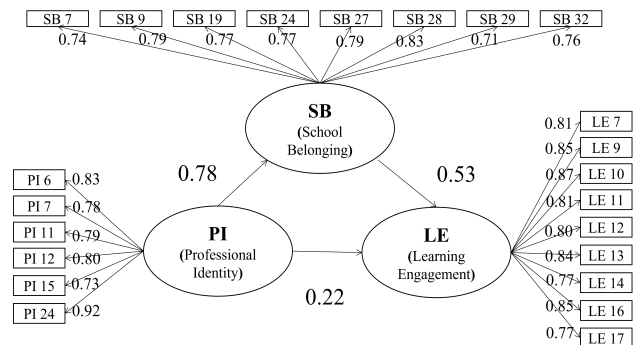


Fig. 2. Test results of learning engagement model for growing cadres.

D. Mediation Effect Test

This study used Bootstrap to test the mediating effect of SB. There were 5000 repeated samples taken with a return period, and the significance was tested based on

whether the 95% confidence interval included 0. The analysis results are shown in Table IV. According to the results of the mediating effect test, there is a mediating effect between SB and the relationship between PI and LE.

TABLE IV. MEDIATION EFFECT TEST RESULTS

Attribution	Way	Confidence Interval	Path Effect Quantity	Effect	Total Effect
Direct Effect	PI→LE	[0.001, 0.552]	0.22	0.22	0.633
Indirect Effect	PI→SB→LE	[0.229, 0.623]	0.78×0.53	0.413	

As can be seen from Table IV, the direct effect of professional identity on LE ( $\gamma = 0.22$ ,  $p < 0.05$ ). The intermediary effect test shows that the intermediary effect value of attribution between PI and LE is 0.413, and the 95% confidence interval for “PI→SB→LE” is [0.57, 0.61], excluding 0, indicating that the intermediary effect is significant. The direct and indirect effects of attribution on LE are significant, indicating that attribution plays a partial mediating role between PI and LE. The total effect of professional identity and attribution on LE is 0.633, with the intermediary effect accounting for 65.24%.

### E. Conclusion

From the above statistical results, it can be seen that the research results show that the professional identity of military school growing cadres has a direct positive impact on learning engagement, and school belonging plays a mediating role between professional identity and learning engagement. Enhancing the sense of school belonging can play a greater role in the impact of professional identity on learning engagement.

## VI. STRATEGIES AND SUGGESTIONS FOR IMPROVING LEARNING ENGAGEMENT OF GROWING CADRES

In view of the above research conclusions on learning engagement of growing cadres, from the perspectives of professional identity and school belonging, the following three countermeasures and suggestions are proposed to enhance learning engagement of growing cadres and improve the quality of their training.

### A. Enhance the Sense of Mission Honor

Flexible use of multiple methods to strengthen the ideological foundation of growing cadres, enhance their understanding and love of their majors, generate a higher level of professional identity, and more effectively enhance their level of learning engagement [11]. For example, invite outstanding graduate students to return to their alma mater, conduct lectures and exchange meetings on job selection and job experience sharing, and conduct on-site exchanges with students to dispel doubts. This will enable cadres and students to fully feel their sense of responsibility and recognize that military personnel are the most respected profession in society. This will further encourage growing cadres in military academies, thereby increasing their recognition of their positions and majors, and enhancing their learning engagement as a driving

force. At the same time, we will strengthen education in ideals and beliefs, carry out model publicity and red gene inheritance work, inherit excellent traditions, draw nutrients from excellent ideals and beliefs, enrich the sense of mission of military academy growing cadres, thereby further radiating into the aspect of learning engagement, promoting learning quality and efficiency as a source of motivation, and cultivating a sense of mission honor among students.

### B. Enhanced Specialization and Refining

Focusing on strong ability preparation, adopting communication and employment methods to break down barriers to learning and employment, colleges and universities have chosen the “pre graduate, first employment” model, taking the lead in diverting students into grassroots positions for half a year, and through intensive practical training in multiple subjects, enabling growing cadres to have a deeper and more relevant understanding of their majors and first positions. Using practical training, problem-oriented, task-driven, to enable students to understand what they lack, what is lacking at the grassroots level, and what is going to happen in the future. Returning to the college with problems and conducting targeted learning according to the needs of practical positions can help improve students’ learning engagement and efficiency, and optimize training effectiveness.

### C. Vitalize Training Resources

Break down barriers to collaborative innovation, create a people-oriented, student-centered school atmosphere, enhance students’ school belonging, flexibly use educational resource allocation, and promote colleges to build a training system that meets the current situation [12]. Focus on professional basic theoretical learning and personal practical training, close to actual combat, continuously optimize learning efficiency, and steadily cultivate the revolutionary cohesion of military academy growing cadres from the actual combat situation. Strengthen students’ sense of ownership and responsibility, strengthen school history and sentiment education, and stimulate students’ sense of honor and responsibility in the school. Improve the basic facilities of the school, accelerate the construction of information and intelligent teaching conditions, build a high-quality and efficient physical campus environment, optimize the learning and life experience of students, and build a high-quality environment that supports teaching and training.

## VII. CONCLUSION

This article investigates the current situation of learning engagement, professional identity, and school affiliation among growing cadres through a questionnaire survey, and uses statistical tools to conduct data analysis to explore the impact of professional identity, school affiliation, and learning engagement. It constructs a learning engagement model for growing cadres, and proposes strategies to enhance learning engagement, with a view to providing theoretical basis and practical

guidance for the education and cultivation of growing cadres. This model can be used as a core indicator for the study of learning engagement of growing cadres. In the next stage, it is proposed to incorporate other influencing factors (such as self-efficacy, achievement motivation, etc.) to further enrich the theoretical basis of military education and enrich the connotation of the learning engagement model of growing cadres.

#### CONFLICT OF INTEREST

The authors declare no conflict of interest.

#### AUTHOR CONTRIBUTIONS

Cui Can completed the research design and data analysis independently, Yan Binggang participated in the data collection, Jiang Zhibin proofread all drafts, Dong Guangzhi did the objective review of the paper. All authors had approved the final version.

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