

Major satisfaction was the degree to which students subjectively recognized the curriculum, teaching staff, practical resources, employment prospects, and other aspects of their major, which directly reflected the quality of major construction and students' learning experience. From the current situation of students' major satisfaction in China, most students recognized the teaching strength and practicality of the major's curriculum, but some students lacked interest in the major due to the influence of external factors such as score restrictions and parental suggestions when choosing the major at the time of admission (Tao, 2019). Some students felt that there were insufficient professional practice resources, making it difficult to convert theoretical knowledge into practical ability, and some students were worried about the employment

China's higher education shifted from expansion to quality improvement. Cultivating university students with professional identity and autonomous development capacity became an important direction for local universities to achieve comprehensive development and serve the regional economy. For university students, major satisfaction referred to their comprehensive cognitive and affective evaluation of curriculum development, faculty strength, practical training, academic atmosphere construction, and major prospects, which was directly related to their learning engagement, professional belonging, and long-term career planning (Chen, 2025). Self-directed learning ability was a key competency for students to break away from passive learning, realize independent knowledge construction, and achieve lifelong learning, which directly influenced their adaptability to future careers and social development (Li & Yang, 2022). Both had been important indicators for evaluating the quality of talent cultivation in universities.

In the practice of Zhengzhou Technology and Business University, although the university had continuously promoted major construction, improved the curriculum system, and built diverse learning support platforms to enhance students' overall major satisfaction and self-directed learning ability, prominent problems still existed in the actual training process. Some students had entered their major due to non-independent factors such as college entrance examination score adjustment and family influence, lacking intrinsic interest in and in-depth identity with their major. Their learning initiative and sustainability had been obviously insufficient, and it had been difficult for them to form a stable sense of professional belonging (Zhang, 2019). For a small number of majors, practical teaching resources and training conditions had not been closely connected with real industrial demands, leading to a disconnect between theoretical teaching and professional application. As a result, students had worried about their major development prospects and employment competitiveness, which had further reduced their major satisfaction (Zhang & Cui, 2021). Meanwhile, some students had not

completed the transformation from exam-oriented learning in senior high school to self-directed learning in university. They had lacked clear learning goals and planning awareness and had shown poor time management and self-discipline. Faced with abundant online and offline learning resources, they had not been able to effectively screen, integrate, and utilize them, resulting in low learning efficiency. When encountering academic difficulties, they lacked the willingness to explore actively, solve problems independently, or seek help, and had been prone to academic procrastination and low-quality task completion. Therefore, their overall self-directed learning ability still needed to be greatly improved (Zhang & Chen, 2025).

The above problems had not only restricted students' individual learning effectiveness, competency development, and future career competitiveness but had also limited the overall improvement of the university's talent training quality. At that time, there had been a lack of systematic and targeted empirical research on the current characteristics of and internal relationship between university students' major satisfaction and self-directed learning ability, which had made it difficult to provide a scientific basis for precise education and teaching reform. Therefore, this study took university students of Zhengzhou Technology and Business University as the research object to systematically explore the relationship between major satisfaction and self-directed learning ability. It aimed to provide theoretical references and practical support for optimizing the talent training program and enhancing students' professional identity and self-directed learning ability.

Research Objectives

- 1) To understand the demographic characteristics of students at Zhengzhou Technology and Business University in Henan Province, including gender, residence, grade level, major, and class leader.
- 2) To understand the current status of students' major satisfaction at Zhengzhou Technology and Business University.
- 3) To understand the current status of students' self-directed learning ability at

Zhengzhou Technology and Business University.

- 4) To explore the differences in students' major satisfaction at Zhengzhou Technology and Business University across different demographic variable.

- 5) To explore the differences in students' self-directed learning ability at Zhengzhou Technology and Business University across different demographic variables.

- 6) To analyze the correlation between students' major satisfaction and self-directed learning ability at Zhengzhou Technology and Business University.

Research Hypotheses

H1: There were significant differences in students' major satisfaction at Zhengzhou Technology and Business University across different demographic variables.

H2: There were significant differences in students' self-directed learning ability at Zhengzhou Technology and Business University across different demographic variables.

H3: There was a significant positive correlation between students' major satisfaction and self-directed learning ability at Zhengzhou Technology and Business University in Henan Province.

Literature Review

Research on Major satisfaction

Major satisfaction, an important branch of satisfaction research in the field of education, was at its core the subjective evaluation formed by learners based on their professional learning experience, reflecting the degree of fit between major-related provision and individual needs and expectations. It was both process-oriented and accumulative, encompassing both the immediate perception of each aspect of professional learning and the comprehensive attitudes formed over a long period of learning.

The definition of major satisfaction in foreign countries incorporated a multi-dimensional perspective earlier. Naveh et al. (2012) analyzed major satisfaction from the perspective of organizational behavior and proposed that it was the emotional identification and sense of value realization that students obtained in professional

communities, which involved multiple aspects such as academic recognition and support in interpersonal communication. Vallejo et al. (2019) proposed that, in combination with positive psychology theory, major satisfaction was the result of a positive correlation between the degree of self-directed learning ability and perceived professional value. They emphasized the positive role of major satisfaction in enhancing an individual's psychological capital.

Domestic studies have defined the connotation of major satisfaction by drawing on foreign theories and adapting to local realities. Liu (2014) proposed that major satisfaction was essentially the degree of subjective perception formed by students regarding their major and various factors related to the major. The study also pointed out that major satisfaction was a source of motivation for university students to study their major. It not only had a profound impact on the quality of life of university students, but was also closely related to their employment tendencies, employment expectations, and career planning. Wang (2020) broke away from the previous single perception that major satisfaction was merely outcome feedback and proposed that major satisfaction was a cumulative process variable, and that when defining it, it was necessary to combine the dimensions of professional expectation and professional perception. This view highlighted the dynamic development of major satisfaction.

To sum up, relevant scholars at home and abroad have explored the connotation of major satisfaction based on different theories and perspectives, and the core consensus was that major satisfaction was the product of the interaction between the individual and the professional environment, with emotional experience, value judgment, and development orientation. Its connotation needed to be dynamically defined in combination with educational level, group characteristics, and training goals, providing a theoretical basis for subsequent dimension division and measurement. This study focused on university students' major satisfaction. Through a comprehensive comparison of relevant research results at home and abroad, it agreed with the research viewpoint of Liu (2014) and thus adopted his viewpoint.

Major satisfaction was defined as the degree to which students subjectively perceived their major and related factors.

Research on Self-Directed Learning Ability

Self-directed learning ability was a core competence formed by an individual during the learning process, manifested as the comprehensive ability to actively set goals, regulate the process, and achieve learning outcomes. Its connotation was both subjective and dynamic, including both internal motivation and cognitive elements as well as external strategy and environmental adaptation features. As the cornerstone of lifelong learning, its content was continuously enriched by the transformation of educational models and technological advancements, becoming a key link between individual development and educational quality.

The theoretical framework for defining the connotation of self-directed learning ability was formed relatively early abroad. Zimmerman (1990) proposed that self-directed learning ability was a self-regulated learning process, specifically covering the three-core links of self-observation, self-judgment, and self-response, emphasizing the individual's active monitoring and adjustment of the learning process and breaking through the cognitive limitations of simple spontaneous learning. Bjork et al. (2012) supplemented this line of research from the perspective of learning science, proposing that self-directed learning ability encompassed the selection and application of effective learning strategies, emphasizing the core role of metacognition in strategy optimization and making the definition of its connotation more practically instructive.

Domestic research on the definition of self-directed learning ability combined theoretical references with local context adaptation. Zhang (2025), based on Self-Determination Theory (SDT), defined it as the comprehensive competence of an individual to actively carry out learning planning, method selection, and effect evaluation under the influence of internal and external factors, with the core being the satisfaction of the three basic needs of autonomy, ability, and belonging, highlighting its adaptability to the individual's development needs.

Based on this, 380 questionnaires were distributed, and 362 valid responses were collected, resulting in an effective return rate of 95.26%.

This study used a questionnaire survey method to investigate students' major satisfaction and self-directed learning ability at Zhengzhou Technology and Business University in China, based on the major satisfaction Scale developed by Liu (2014) and the Self-Directed Learning Ability Scale by Zhan (2024).

The questionnaire, titled Questionnaire on Zhengzhou Technology and Business University Students' Major Satisfaction and Self-Directed Learning Ability, was divided into three parts. Section 1 was the introduction, which explained the purpose of data collection. Section 2 included basic information and collected data on demographic variables, such as gender, residence, grade level, major, and class leader. Section 3 included the students' major satisfaction and self-directed learning ability survey. The major satisfaction questionnaire consisted of 27 items and was divided into five dimensions of university students' major satisfaction: curriculum development, faculty strength, practical training and internship, academic atmosphere construction, and major prospects. The self-directed learning ability questionnaire consisted of 32 items and was divided into eight dimensions of university students' self-directed learning ability: self-motivation, self-decision making, self-monitoring, self-regulation, resource integration, interpersonal communication, self-cognition, and self-reflection. Both surveys were scored using a five-point Likert scale, with scores ranging from 1 to 5 for strongly agree, agree, neutral, disagree, and strongly disagree.

This study examined the reliability of the Major Satisfaction Scale developed by Liu (2014) and the Self-Directed Learning ability Scale developed by Zhan (2024). The reliability test of the Major Satisfaction Scale, the total Cronbach's α coefficient of the questionnaire was .916, and the Cronbach's α coefficients of each subdimension ranged from .861 to .900. The reliability of the Self-Directed Learning Ability Scale, the total Cronbach's α coefficient of the questionnaire was .978, and the Cronbach's α coefficients of each subdimension ranged from .791 to .923. In

short, the reliability of these two scales was good, making them suitable for use in this study.

The validity test results of the Major Satisfaction Scale. the results of exploratory factor analysis showed that the KMO value was .945, and the Bartlett's test of sphericity reached a significant level ($p < .001$), which indicated that the data were suitable for factor analysis. The cumulative explained variance of the five extracted factors reached 61.288%, indicating good validity. The validity test of the Self-Directed Learning Ability Scale. The results of exploratory factor analysis showed that the KMO value was .909, and the Bartlett's test of sphericity reached a significant level ($p < .001$), which indicated that the data were suitable for factor analysis. The cumulative explained variance of the eight extracted factors reached 69.604%, which was an ideal result indicating good validity. Therefore, these two scales for university students demonstrated good validity and were suitable for use in this study.

Data were collected using a questionnaire survey and were processed and analyzed using SPSS 23.0 statistical software.

First, descriptive statistical analysis was conducted on the valid data. Through frequency statistics and percentage calculations, the demographic background variables and the current status of major satisfaction and self-directed learning ability of the university students at Zhengzhou Technology and Business University in Henan Province were systematically presented to clarify the overall distribution characteristics of the two variables.

Second, group differences were examined using independent-samples t tests and one-way ANOVA to explore the differences in major satisfaction and self-directed learning ability among the university's students in terms of demographic background variables such as gender, residence, grade, major, and class leader.

Third, Pearson correlation analysis was conducted to verify the correlation between students' major satisfaction and self-directed learning ability and to combine the conclusions of the previous two steps to verify whether the research hypothesis was valid.

3. Results

The sample sizes of this study based on different demographic backgrounds were as follows. In terms of gender, there were 217 female students, accounting for 59.9%. In terms of residence, 193 were rural students, accounting for 53.3%. In terms of grade, the number of participants across the four grades was generally balanced. In terms of majors, there were 144 science students, accounting for 39.8%. In terms of class leader status, 96 students served as class leaders, accounting for 26.5%.

Table 1: Demographic Characteristics of the Student Sample

Demographic Variable	Group	Number	Percentage
Gender	Male	145	40.1
	Female	217	59.9
Residence	Urban	169	46.7
	Rural	193	53.3
Grade level	Freshman	97	26.8
	Sophomore	97	26.8
	Junior	84	23.2
	Senior	84	23.2
Major	Liberal Arts and History	130	35.9
	Science and Engineering	144	39.8
	Others	88	24.3
Class Leader	Class Leader	96	26.5
	Non-Class Leader	266	73.5
Total		362	362

1) Students' major satisfaction and self-directed learning ability at Zhengzhou Technology and Business University were at a high level.

Table 2: Descriptive Statistics of Students' Major Satisfaction

Dimension	<i>n</i>	<i>M</i>	<i>SD</i>	Interpretation
Curriculum Development	362	3.44	.70	Moderate
Faculty Strength	362	3.61	.67	High
Practical Training	362	3.70	.60	High
Academic Atmosphere Construction	362	3.81	.58	High
Major Prospects	362	3.63	.59	High
Total	362	3.66	.55	High

The total university students' major satisfaction was $M = 3.64$, $SD = 0.55$, and the analysis result showed that it was at a high level.

Therefore, the overall major satisfaction of students at Zhengzhou Technology and Business University was at a high level.

Table 3: Descriptive Statistics of Students' Self-Directed Learning Ability

Dimension	<i>n</i>	<i>M</i>	<i>SD</i>	Interpretation
Self-Motivation	362	3.77	.66	High
Self-Decision Making	362	3.66	.64	High
Self-Monitoring	362	3.40	.68	Moderate
Self-Regulation	362	3.55	.74	High
Resource Integration	362	3.70	.62	High
Interpersonal Communication	362	3.61	.64	High
Self-Cognition	362	3.74	.66	High
Self-Reflection	362	3.74	.66	High
Total	362	3.65	.55	High

The total university students' self-directed learning ability was $M = 3.65$ and $SD = .55$, which indicated a high level. Therefore, the students' self-directed learning ability at Zhengzhou Technology and Business University was at a high level.

2) There were significant differences in students' major satisfaction at Zhengzhou Technology and Business University across different demographic backgrounds.

Table 4: Results of Independent Samples T-Test on Students' Major Satisfaction by Gender

Dimension	Male (<i>n</i> =145)		Female (<i>n</i> =217)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Curriculum Development	3.41	.42	3.55	.49	-2.76	.006**
Subject Support	3.47	.51	3.62	.58	-2.38	.018*
Practical Training	3.64	.42	3.80	.46	-3.50	.001**
Academic Atmosphere Construction	3.78	.53	3.81	.55	-0.36	.723
Major Prospects	3.54	.50	3.70	.51	-3.00	.003**
Total	3.75	.35	3.69	.40	-3.15	.002**

* $p < .05$, ** $p < .01$

There was a significant difference in total student perception of major satisfaction between males ($M = 3.75$, $SD = .35$) and females ($M = 3.69$, $SD = .40$) ($t = -3.15$, $p < .01$). Therefore, there were significant differences in students' major satisfaction by gender was valid. Overall, in terms of perception of major satisfaction as a whole and all its dimensions, females were significantly

higher than males.

3) There were significant differences in students' self-directed learning ability at Zhengzhou Technology and Business University across different demographic backgrounds.

Table 5: Results of Independent Samples T-Test on Students' Self-Directed Learning Ability by Gender

Dimension	Male (n=145)		Female (n=217)		t	p
	M	SD	M	SD		
Self-Motivation	3.69	.68	3.82	.65	-1.84	.067
Self-Decision Making	3.49	.62	3.78	.63	-4.28	.000***
Self-Monitoring	3.27	.65	3.48	.69	-2.99	.003**
Self-Regulation	3.37	.71	3.67	.73	-3.75	.000***
Resource Integration	3.57	.59	3.80	.61	-3.52	.000***
Interpersonal Communication	3.50	.65	3.68	.63	-2.57	.011*
Self-Cognition	3.69	.65	3.77	.66	-1.09	.279
Self-Reflection	3.66	.65	3.80	.66	-2.00	.047*
Total	3.53	.53	3.72	.56	-3.28	.001**

* $p < .05$, ** $p < .01$, *** $p < .001$

There was a significant difference in total self-directed learning ability between male students ($M = 3.53$, $SD = .53$) and female students ($M = 3.72$, $SD = .56$) ($t = -3.282$, $p < .01$). Therefore, which stated that there was a significant difference in university students' self-directed learning ability by gender, was supported. To sum up, female students had significantly higher self-directed learning ability than male students in the dimensions of self-decision-making, self-motivation, self-monitoring, self-regulation, resource integration, interpersonal communication, and self-reflection.

4) There was a significant positive correlation between students' major satisfaction and self-directed learning ability at Zhengzhou Technology and Business University.

As shown in Table 6, the total major satisfaction of university students was significantly and positively correlated with self-motivation ($r = .357$, $p < .01$), self-decision-making ($r = .339$, $p < .01$), self-monitoring ($r = .402$, $p < .01$), self-regulation ($r = .331$, $p < .01$), resource integration ($r = .396$, $p < .01$), interpersonal communication ($r = .366$, $p < .01$), self-cognition ($r = .232$, $p < .01$), and self-reflection ($r = .305$, $p < .01$) in self-directed learning ability.

Table 6: Correlation between Students' Major Satisfaction and Self-Directed Learning Ability 1

Dimension	Curriculum Development	Faculty Strength	Practical Training	Academic Atmosphere Construction	Major Prospects	Major Satisfaction
Self-Motivation	.153**	.173**	.310**	.466**	.241**	.357**
Self-Decision Making	.183**	.223**	.263**	.336**	.268**	.339**
Self-Monitoring	.202**	.227**	.368**	.401**	.323**	.402**
Self-Regulation	.133*	.172**	.356**	.329**	.266**	.331**
Resource Integration	.273**	.292**	.315**	.370**	.283**	.396**
Interpersonal Communication	.193**	.217**	.338**	.360**	.282**	.366**
Self-Cognition	.098	.125*	.168**	.358**	.119*	.232**
Self-Reflection	.127*	.109*	.261**	.433**	.223**	.305**
Self-Directed Learning Ability	.197**	.230**	.358**	.458**	.300**	.408**

* $p < .05$, ** $p < .01$

Total self-directed learning ability of university students was significantly and positively correlated with curriculum development ($r = .197$, $p < .01$), faculty strength ($r = .230$, $p < .01$), practical training ($r = .358$, $p < .01$), academic atmosphere construction ($r = .458$, $p < .01$), and major prospects ($r = .300$, $p < .01$) in major satisfaction.

The correlation coefficient between university students' total major satisfaction and total self-directed learning ability was $r = .408$, $p < .01$, indicating a significant positive correlation between major satisfaction and self-directed learning ability.

Overall, there was a significant positive correlation between the totals and various dimensions of university students' major satisfaction and self-directed learning ability.

4. Discussion

In terms of gender differences, the major satisfaction of female students at Zhengzhou Technology and Business University was significantly higher than that of male students. The research findings are consistent with those of Gao (2021). Gao (2021) suggested that female students tended to show greater meticulousness and engagement in their professional studies. They were particularly serious about every course and every practice, and had a more acute and delicate perception of the rationality of professional-related course settings, the perfection of teaching details, and the quality of teacher services than male students. They not only focused on the

outcome of professional learning, but also valued every experience and gain during the learning process. Even a patient explanation from a teacher in class or a timely answer after class could become an important factor in enhancing students' professional recognition. Compared to males, females were more willing to actively pay attention to all kinds of information related to their major, whether it was industry development trends, professional competition notices, or various academic lectures and practical opportunities. They actively participated, raised their hands in class to speak, asked teachers after class, and actively engaged in professional practice activities. These proactive behaviors strengthened females' sense of identity and belonging to their professional studies (Liu, 2014).

In terms of residence, rural students' major satisfaction was significantly higher than that of urban students. The research findings are consistent with those of Huang (2020). Huang (2020) found that rural students mostly faced relatively limited educational resources during their growth and therefore had a much stronger desire for higher education than urban students. Being able to smoothly enter university and study their desired major was a rare growth opportunity for students, which inherently had a strong sense of cherishing and identification. Compared with urban students, rural students had more practical expectations for professional learning. They did not overly pursue the "hot" and "glamorous" aspects of the major, but rather valued the knowledge enhancement, skill refinement, and career development opportunities that the major could bring. As long as they could gain real growth in professional learning, they were more likely to have a sense of major satisfaction.

The differences at the grade level showed obvious gradient characteristics, with juniors and seniors having significantly higher major satisfaction than freshmen and sophomores, and this gradient difference gradually became more pronounced as the grade level increased. Tao (2019) stated in his study that, as the grade advanced, junior and senior students began to have in-depth exposure to the core courses of the major, gradually acquire the essential knowledge and skills of the major, and have more opportunities to

participate in professional practice, internship, and training activities, combine the theoretical knowledge in the classroom with actual working scenarios, and deepen their understanding of the major through repeated practice, thereby being able to clearly grasp the learning focus and future development direction of the major (Zhang, 2019).

In terms of major differences, the major satisfaction of students in liberal arts and science was significantly higher than that of students in other majors. The research findings are consistent with those of Cao (2019). As the core majors of Zhengzhou Technology and Business University, the school invested more human, material, and financial resources in the construction of these two majors. The curriculum had been optimized and improved over a long period of time, which was more in line with the learning needs of students and the development trends of the industry. The faculty was also stronger, with both rich teaching experience and a solid professional foundation. It was capable of providing students with high-quality instruction.

Whether or not students had class-leader experience directly affected students' major satisfaction. Students with class-leader experience scored significantly higher in this dimension than those without, and this difference was reflected in the depth of their understanding of the profession and the breadth of their experience. Tao (2019) suggested that students with class-leader experience needed to be involved in the school's teaching management, academic atmosphere construction, and other related work during their tenure, which enabled them to have a deeper understanding of the school's professional construction planning and teaching reform direction, and to provide more direct feedback on students' needs and suggestions in professional learning. They also had more frequent and smooth communication with teachers and classmates, more convenient access to professional-related guidance and assistance, and were able to resolve confusion encountered in professional learning in a timely manner.

In terms of the gender dimension, female students performed significantly better than male students in terms of self-directed learning ability. According to Zhang (2025), based on the self-

decision-making theory, females' innate meticulousness and rigor made them more stable and organized in self-management. Facing various self-directed learning tasks, they were able to combine their learning pace and professional requirements to rationally plan time, formulate detailed and feasible learning plans, and manage their learning process. They were better at self-restraint, active reflection, and timely discovery and improvement of their learning deficiencies.

Different residences showed significant differences in students' self-directed learning ability over a long period of growth, with rural students generally having a higher self-directed learning ability than urban students. The research findings are consistent with those of Zhan (2024). During the basic education stage, rural students often lacked adequate external supervision and abundant learning resources, their parents' educational guidance was relatively limited, and school teaching conditions were difficult to compare with those in cities. After entering university, in the face of a relatively open and free learning environment, rural students could quickly adapt to this self-directed learning mode, actively set learning goals, reasonably arrange learning tasks, and consciously complete various learning tasks without excessive external guidance and supervision, always maintaining an active learning state (Zhan, 2024).

Self-directed learning ability was not constant but showed a significant improvement with grade, with juniors and seniors significantly better than freshmen. The research findings are consistent with those of Ma and Wang (2025). Their research findings indicate that freshmen, who had just transitioned from passive learning patterns in middle school to self-directed learning patterns in college, often felt at a loss in the face of a suddenly relaxed learning environment, flexible learning time, and diverse learning tasks, and had not yet formed a mature self-directed learning system. There were still obvious deficiencies in key dimensions such as self-planning, self-monitoring, and resource integration, and the ability of self-directed learning was relatively weak, requiring some time to adapt and adjust. After two years of study and practice, sophomores gradually adapted to the pace of self-

directed learning at the university, and their self-directed learning ability began to improve slowly. As they entered their junior and senior years, the professional courses gradually deepened, the learning difficulty increased, and with the pressure of multiple tasks such as graduation design, internship, and employment, students had to rely on a stronger self-directed learning ability to deal with various challenges.

The influence of major types on students' self-directed learning ability was relatively significant. Among them, the students' self-directed learning ability in science and engineering was significantly higher than that of students in other majors. The formation of this difference was closely related to the unique learning characteristics and training objectives of science and engineering majors (Bjork et al., 2012). During the learning process, science and engineering students often needed to independently consult academic materials, design experimental plans, conduct experimental research, and solve professional problems. This learning model that emphasized practice and exploration could continuously strengthen students' self-motivation, self-monitoring, and resource integration abilities, making self-directed learning an essential learning quality (Ma & Wang, 2025).

Class leader experience had a significant positive effect on the improvement of students' self-directed learning ability. Students with class-leader experience performed significantly better in self-directed learning ability than non-class leaders. The research findings are consistent with those of Chen (2025). The research findings indicate that long-term cadre work training could enable students to gradually form an efficient self-directed learning model, learn to allocate time reasonably, clarify learning priorities, and complete learning and work tasks within a limited time (Zhang, 2025).

There was a stable and significant positive relationship between students' major satisfaction and self-directed learning ability at Zhengzhou Technology and Business University. Throughout the academic development process of university students, the two have formed a dynamic relationship of mutual nourishment and mutual

promotion. Zhang and Cui (2021) found that the higher students' recognition of their major, the stronger their sense of acceptance and belonging was. This positive subjective cognition prompted students to invest more time, energy, and initiative in professional learning, and they were no longer satisfied with passively accepting knowledge taught in the classroom. Instead, they were more willing to actively plan their learning direction, set learning tasks, and achieve their academic goals through their own thinking and exploration. This intrinsic motivation, stimulated by professional identity, directly translated into specific behavioral manifestations of self-directed learning, making students more proactive in all aspects of learning goal setting, learning process management, learning resource utilization, and learning effect reflection, no longer showing perfunctory or passive learning, and gradually developing good habits of active learning and self-improvement.

From the overall logic of university students' academic development, major satisfaction focused on students' inner attitudes and emotional experiences toward their majors. It was an internal, subjective cognitive evaluation that directly affected students' willingness to learn and engagement. Self-directed learning ability, on the other hand, pointed to the external learning behavior and ability quality of students. It was an important support for students to complete professional learning and achieve personal growth, and directly determined the learning effect and the speed of ability improvement. Positive emotional experiences drove the optimization of learning behaviors, making students more willing to actively engage in self-directed learning and continuously improve their abilities. Stable and efficient learning behaviors, in turn, reinforced positive emotional cognition, allowing students to gain growth while further enhancing their recognition and major satisfaction (Li & Yang, 2022). Both supported and promoted each other, together forming the intrinsic mechanism of university students' academic development, and it was precisely this intrinsic synergy that led to a close and significant positive correlation between major satisfaction and self-directed learning ability.

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