

Enhancing Recruitment Strategies for Early Childhood Education Programs: A Case Study of Vocational Colleges in Huaibei

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Abstract – With the decrease in the number of school-age children, the current early childhood education major is facing a critical transformation period. How to optimize the enrollment strategy to improve the quality of talent cultivation has become a key demand for relevant higher vocational colleges. This study aims to explore the influencing factors for students in higher vocational colleges in Huaibei city to choose the early childhood education major and optimize the enrollment strategy accordingly. Using a quantitative research method, through a questionnaire survey of 367 respondents, combined with descriptive analysis and principal component analysis, it was found that family factors (weight 33.50%), social needs (weight 26.80%), education policies (weight 20.20%) and personal factors (weight 19.50%) are the main influencing factors. Among them, parental support, industry development trends and enrollment policies are the key driving factors. The findings not only offer practical guidance for optimizing enrollment strategies in higher vocational colleges but also provide broader implications for improving talent cultivation and policy alignment in early childhood education programs facing demographic decline.

Keywords - Early childhood education, enrollment strategies, influencing factors, vocational colleges, Huaibei city.

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1. Introduction

Against the dual backdrop of educational reform and demographic structural changes, China's early childhood education major is undergoing a critical transition period filled with both opportunities and challenges. On the one hand, the current situation of early childhood education teachers shows characteristics of short supply and an unbalanced supply structure. Specifically, as the global enrollment rate of children aged 3 - 6 increased from 47% in 2010 to 62% in 2020, the current shortage of early childhood education teachers has reached as high as 15 million. In China, this supply - demand contradiction is manifested as a misalignment between policy drive and market response. China's early childhood education policy features "strong government promotion." According to the World Bank's calculations, although the proportion of fiscal early childhood education funds in China increased from 1.7% in 2010 to 5.9% in 2020, there are still significant regional differences in policy effects [1]. On the other hand, in the future, there will be a serious oversupply of early childhood education teachers. Since the implementation of China's "two - child" and "three - child" policies, the number of newborns has been continuously decreasing (10.62 million, 9.56 million, and 9.02 million in 2021 - 2023 respectively), leading to a reduction in the number of early childhood education institutions and intensified competition in the job market. Using the cohort - component population projection method and constructing an ARIMA time - series model. Previous research shows that as the fertility rate gradually declines, the scale of students in Chinese schools will sharply decrease in the next few years [2].

Therefore, the early childhood education major in higher vocational colleges is currently facing a critical period of transformation.

As the main training institutions for early childhood education talents, the early childhood education majors in higher vocational colleges undertake the main tasks such as the screening of early childhood education talents, theoretical education, and support for practical training, and have a crucial impact on the cultivation of the comprehensive quality of early childhood education teachers. Recent studies have pointed out that global early childhood education policies have shifted toward emphasizing teacher quality, employment prospects, and policy incentives. These policies have a profound impact on parents' cognition and decision-making regarding the early childhood education major, with more attention paid to the quality of teaching staff, employment prospects, and policy dividends [3]. This will lead to a structural evolution in the market demand for early childhood education teachers, and inevitably, there will be an increasing demand for the comprehensive quality of early childhood education teachers. Empirical evidence from developing countries indicates that the training effectiveness of preschool children is significantly influenced by the professional competence of early childhood education teachers [4]. In addition, it has also been reported that the overall knowledge level of preschool teachers remains relatively low, which may constrain their instructional capacity [5]. With the gradual decrease in the number of applicants for the early childhood education major, the early childhood education majors in many higher vocational colleges will face the dilemma of a shortage of students. Against this background, improving the quality of talent cultivation has become a key pathway for early childhood education majors in higher vocational colleges to enhance their overall competitiveness [6]. Further, in the comprehensive cultivation framework of early childhood education, student source selection is the starting point of talent cultivation. Whether it can respond to students' demands and attract high-quality students is related to the comprehensive quality of talent cultivation. Therefore, for the early childhood education majors in higher vocational colleges, it is necessary to explore the influencing factors when students select this major, so as to provide theoretical suggestions for optimizing the enrollment strategy.

In Huaibei city, an important educational node city in Anhui Province, currently only one vocational college offers the early childhood education major. Compared with other cities in China, Huaibei city has its own uniqueness due to its distinctive features such as economic structure and geographical location. As a resource-based city, the development of early childhood education in Huaibei city is restricted by the "siphon effect".

The proportion of early childhood education teachers flowing to cities like Hefei and Nanjing from this city is close to 30% [7], and the turnover rate of preschool teachers in local private kindergartens also remains high. This talent outflow is similar to the "educational immigration" phenomenon in Quebec, Canada. However, the latter controls the salary gap of early childhood education teachers within 15% through provincial fiscal transfer payments, effectively curbing the outflow trend of early childhood education teaching staff. The unbalanced regional development not only weakens the attractiveness of the major but also exacerbates educational inequality through the resource allocation mechanism [6]. Therefore, this study takes vocational colleges in Huaibei city as the research object, aiming to explore the key influencing factors for students in vocational colleges in Huaibei city to choose the early childhood education major, and on this basis, provide suggestions for optimizing the enrollment strategies of the early childhood education major in relevant vocational colleges.

In fact, there have been relatively many studies on the influencing factors for students to choose the early childhood education major. According to the different sources of influencing factors, these studies can be divided into several types. First is the employment prospect, such as the relatively low salary level [8]. In addition, in China, early childhood education teachers are usually considered to be female. The gender stereotype also makes society less willing to accept "male early childhood education teachers" [9], leading to males usually not choosing the early childhood education major. Second is the quality of talent cultivation. Factors such as the lagging curriculum design and uneven resource allocation will greatly weaken the attractiveness of a major to students [10]. Research [11] further reveals that institutional support plays a key role in enhancing the attractiveness of vocational education, such as school-enterprise cooperation and professional development opportunities. In terms of individuals and families, personal interests, parents' suggestions, etc. also influence students' choices of this major.

It can be seen that current research has relatively extensively explored the influencing factors of students' choice of early childhood education major, but there are still two deficiencies. On the one hand, current research lacks studies that combine specific cities, especially cities like Huaibei city, which have a relatively poor level of economic development and are severely affected by the siphon effect. Due to limitations in economic structure, culture, etc., compared with other cities, the influencing factors of the early childhood education major in cities like Huaibei may be different.

On the other hand, existing research mainly focuses on some of the factors such as individual, educational, and social factors, lacking an overall examination of the weights of the influencing factors.

Based on previous studies, this research constructs a four - dimensional overall framework of “individual - family - education policy - social demand” and introduces analytical methods such as descriptive statistics and principal component analysis. The research aims to explore the influencing factors for students majoring in early childhood education in higher vocational colleges in Huaibei city to choose this major, so as to provide theoretical references for higher vocational colleges in Huaibei city to improve the quality of talent cultivation and the comprehensive competitiveness of the institutions.

2. Literature Review

This section reviews existing theoretical and empirical studies relevant to students’ major selection in early childhood education, providing the foundation for the present research.

2.1. Influencing Factors

A large number of studies have explored the influencing factors of students’ selection of the early childhood education major, mainly including four categories of influencing factors.

2.1.1. Personal Factors

Personal interests and career planning are direct driving factors. Clear career goals have been shown to enhance students’ professional identity and significantly increase retention rates within three years after graduation [12]. Students with a strong interest in the early childhood education major tend to report higher professional satisfaction and significantly lower levels of job burnout [13]. In addition, self-consistency has been identified as an important factor influencing individuals’ career choices [14]. The higher the matching degree of personal abilities, the stronger the intention to choose the early childhood education major usually is. This means that students with a foundation in music or dance are more likely to choose early childhood education to give full play to their advantages. Gender has also been verified as a significant factor influencing career choices, particularly in professions with strong gender stereotypes [15]. Their research shows that male students tend to avoid choosing majors with a predominantly female - dominated future work environment.

2.1.2. Family Factors

The family’s economic situation, parents’ education level and professional background significantly influence the choice. Existing research suggests that intergenerational transmission plays an important role in career choice, with children tending to select career paths aligned with parental expectations [16]. Further, it has been shown that mothers’ occupational backgrounds exert a stronger influence on their children’s career paths than fathers’ occupations [17]. Because children tend to meet their mothers’ expectations to a greater extent. This means that there is a professional demonstration effect at the family level in the major selection of early childhood education. The family’s economic conditions also affect children’s career choices. The Chinese government has provided rich student aid and tuition waiver policies for students in higher vocational colleges, which has effectively improved the financial situation and education level of students from poor families [18]. Data from a higher vocational college in Huaibei city shows that the continuation rate of students who receive grants is significantly higher than that of those who do not. In addition, parents’ education level indirectly affects decision-making through cognitive support [19], and parents with higher education are more likely to provide professional development advice for their children. In cultural contexts where parenting responsibilities are predominantly borne by women, parents may discourage their daughters from choosing early childhood education due to concerns about work-family balance [20]. Parents may discourage their daughters from choosing early childhood education due to concerns about their future difficulty balancing work and family, thereby weakening the feasibility of “direct demands”. Consistent with the study of private colleges in Oman, authors of the research [21], found that the reputation of colleges and universities, the quality of courses, and family support were the core factors affecting students’ decision-making, while external recommendation was not significant, which further verified the leading role of the “family support” dimension in Huaibei students’ choice of early childhood education major.

2.1.3. Educational Policy Factors

Enrollment policies and national support directly influence the student source structure. The former includes scholarships and separate admissions, while the latter is represented by the “Opinions on Promoting High - quality Development of Modern Vocational Education”.

Evidence from STEM-related fields indicates that strong policy emphasis can significantly attract high-achieving students into targeted disciplines [22]. In fact, a study from Peking University shows that through information intervention and guidance of national policies, as well as necessary economic subsidy policies, future benefits have always been an important measure to intervene in the enrollment structure [23]. How to improve the effectiveness of national policies on enrollment has also been the focus of relevant research. In addition to national policies at the macro - level, the enrollment policies of institutions also have a significant impact on students' major choices. Vocational colleges can intervene in the enrollment results by setting enrollment screening conditions [24].

2.1.4. Social Demand Factors

The demand in the employment market and the development trends of the industry are important external driving forces. Professional identity is of great significance for professional training and serves as the motivation and guarantee for early childhood education students' learning and future careers [25]. Currently, factors such as high teacher entry requirements, a poor social environment, and sub-optimal school training are affecting the professional identity of early childhood education students. Meanwhile, future employment prospects also influence students' major choices.

Employment prospects include multiple aspects such as the employment rate, employment quality, and professional compensation. Previous research indicates that job autonomy, perceived pay fairness, and job security constitute the core micro-level pathways influencing career decisions [26]; among them, "job security" has the strongest mediating effect in low - welfare countries. Building on previous research, an integrated analytical model incorporating genetic factors, school characteristics, social practice, and social cognition was constructed to explain university graduates' career choices [27]. After analyzing 317,900 samples using the machine-learning Apriori algorithm, they found that an individual's gender, perception of society, academic performance at school, etc., significantly affect the individual's post - graduation destination. This means that in the choices of career and major, social expectations of individuals and individuals' perception of society are important influencing factors.

Based on the above review, existing studies generally converge on four major dimensions influencing students' choice of early childhood education major, namely personal factors, family factors, educational policy factors, and social demand factors. These dimensions, together with their representative sub-factors and supporting literature, are systematically summarized in Table 1.

Table 1. Literature-based factors influencing students' choice of early childhood education major

Category of influencing factors	Sub Factor	Representative literature
Personal Factors	Personal interest	Personal interest has been widely recognized as a key determinant in major selection [13], [14].
	Career planning	Clear career planning has been shown to strengthen students' professional identity [12].
	Parents' education level	Parents' education level plays an important role in shaping students' major choices [16].
Family Factors	The economic situation of the family	Family economic conditions have been identified as an influential factor in vocational major selection [18].
	Parents' wishes (parents request to choose a major in early childhood education)	Parental expectations have been found to significantly affect students' career decision-making processes [17].
	The occupational influence of parents (parents working in the field of early childhood education)	Parental occupational background may exert a demonstrative effect on students' major choices [21].
Educational Policies	Admissions policy	Institutional admissions policies can directly shape enrollment outcomes in vocational education [24].
	National policy	National education policies have been shown to influence enrollment structures and student distribution [22], [23].
Social Demand	The demand for talents	Labor market demand plays a crucial role in shaping students' perceptions of professional attractiveness [26].
	Cognition of society	Social cognition and societal expectations have been identified as important factors influencing major selection decisions [26], [27], [28].

2.2. Theoretical Foundation

This section introduces the theoretical frameworks that support the analytical model and guide the interpretation of students' major selection behavior.

2.2.1. Social Network Theory

The social network theory emphasizes that individual decisions are influenced by the relational network in which they are situated [28]. In the context of enrollment, families, alumni, and educational institutions form key nodes. For example, parents working in the early childhood education industry will transmit professional information through their interpersonal networks, influencing students' choices.

2.2.2. Education Economics Theory

Educational economic theory focuses on the relationship between educational resource input and economic returns [29]. The enrollment scale of early childhood education majors needs to match the regional economic development stage. For example, in the later stage of economic transformation, it is necessary to focus on cultivating innovative talents to meet market demands, so as to improve the average salary level of graduates.

2.2.3. Maslow's Hierarchy of Needs Theory

Maslow divided human needs into five levels: physiological, safety, social, esteem, and self-actualization [30]. When students choose the early childhood education major, some do so out of consideration for job stability, which belongs to the safety need; others are motivated by their love for the education cause, which reflects the self-actualization need. Therefore, enrollment strategies should be designed to meet these different levels of needs in a targeted manner.

2.3. Research Review

The existing literature provides multi-dimensional theoretical support and empirical references for this study. The social network theory reveals the important role of families and educational institutions in major selection, which echoes the current situation of insufficient recognition of early childhood education careers by parents in Huaibei city. The theory of educational economics emphasizes the adaptability between major settings and regional economy.

However, most existing studies focus on developed regions and pay insufficient attention to the needs of resource-based cities like Huaibei city during the transformation period. Maslow's hierarchy of needs theory suggests that enrollment strategies should take into account both safety needs, such as employment security, and self-actualization needs, such as professional value recognition. Currently, the problems of low salary levels and narrow promotion channels for early childhood education teachers in Huaibei city are restricting the satisfaction of high-level needs.

In terms of educational policy factors, existing studies have confirmed a strong correlation between policy continuity and enrollment scale, but few literatures explore the local differences in policy implementation. For example, the implementation effect of the national "Opinions on Promoting High-quality Development of Modern Vocational Education" in Huaibei city is restricted by local financial capacity, resulting in the failure to fully release the policy dividends. In addition, most studies on social demand factors start from the macro gap rate but ignore the occupational identity crisis at the micro level. The phenomenon of early childhood education teachers in Huaibei city flowing to cities like Hefei and Nanjing is exactly an embodiment of the "talent siphon" effect caused by unbalanced regional development.

The intergenerational occupational transmission mechanism in family factor research provides a new perspective for optimizing enrollment strategies. The proportion of families in Huaibei city where parents are engaged in the early childhood education industry is very small, which requires enrollment publicity to strengthen the professional demonstration effect. At the same time, the regulating effect of economic capital on major selection may be particularly significant in Huaibei city - as a resource-exhausted city, the per capita income level in Huaibei city is relatively low.

In view of this, this study will focus on the special situation in Huaibei city, construct a four-dimensional linkage strategy system of "policy - family - individual - market", directly address the regional adaptability problem and the weight problem of influencing factors that have not been fully solved in the existing literature, and provide an empirical reference for the transformation of vocational education in resource-based cities.

3. Methodology

This subsection synthesizes key findings and limitations of existing studies, highlighting research gaps that motivate the present investigation.

3.1. Research Design

This study takes the students majoring in early childhood education at the only vocational college in Huaibei city as the research object. Questionnaires are distributed through a combination of online and offline methods such as class groups and classrooms to collect data. Combining theoretical analysis and a review of relevant research, the study identifies four influencing factors including family and individual factors. Drawing on previous studies, this study constructs a structured measurement scale and questionnaire, in which the Likert 5 - point scale (1 = strongly disagree, 5 = strongly agree) is applied.

In addition, this study conducts reliability and validity analyses on the four factors to verify the quality of the measurement scale. Meanwhile, descriptive statistics and principal component analysis are used respectively to determine the relative weights of different factors when choosing the early childhood education major.

Based on the above research design, this study integrates the identified factors into a four-dimensional analytical framework. As illustrated in Figure 1, this framework depicts the conceptual structure and logical relationships among personal factors, family factors, educational policy factors, and social demand factors, serving as the basis for subsequent empirical analysis.

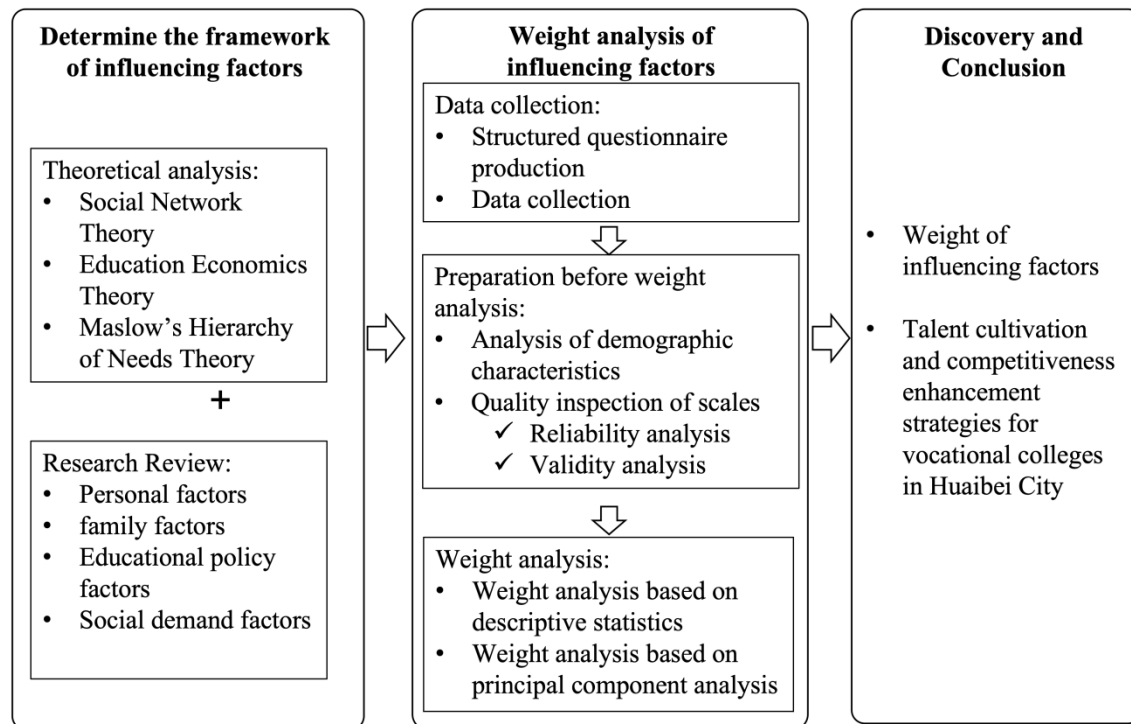


Figure 1. Four-dimensional framework of influencing factors on early childhood education enrollment

This figure with the closed-loop logic of “theory → data → verification → strategy”, clearly presents the complete research path from theoretical construction to empirical analysis and then to policy recommendations. It allows one to intuitively see how each dimension jointly affects students’ decision-making process in choosing the early childhood education major. It not only provides a theoretical mapping for the weight analysis of the four factors, namely individual factors, family factors, education policy factors, and social demand factors, but also ensures that the empirical results are consistent with the conceptual model.

3.2. Sample Collection

There are more than 540 students majoring in early childhood education in a vocational college in Huaibei city. In this study, online methods such as class groups were used to distribute questionnaires. A total of 540 questionnaires were distributed, and 367 valid questionnaires were recovered after strict screening, with an effective recovery rate of 67.96%. Table 2 shows the demographic structure of the sample. According to Table 2, female respondents accounted for 62.9% (231 people), and males accounted for 37.1% (136 people), which is in line with the female - dominated demographic of this field. The subjects were concentrated in the age range of 19 - 22 years old.

Among them, the groups aged 19 (30.8%) and 20 (28.3%) together accounted for 59.1%, reflecting the age characteristics of current students. The grade distribution showed a balanced trend. Freshmen, sophomores, and juniors accounted for 33.5% (123 people), 29.4% (108 people), and 37.1% (136 people) respectively, ensuring full coverage of samples in each learning stage.

Therefore, the sample covered more than half of the current students in this major, and the sample structure was basically consistent with the demographic characteristics of the current students. The sample is fairly representative.

Table 2. The demographic structure of the sample

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	136	37.1
	Female	231	62.9
Age	18 years old	37	10.1
	19 years old	113	30.8
	20 years old	104	28.3
	21 years old	67	18.3
	22 years old and above	46	12.5
Grade	Freshman Year	123	33.5
	Sophomore year	108	29.4
	Junior year	136	37.1
Total		367	100.0

3.3. Reliability Analysis

When using the same measurement tool for multiple measurements, the measurement results have a certain degree of instability. Reliability refers to the consistency of measurement results in multiple measurements, which reflects the quality of the measurement scale. This study mainly focuses on several types of reliability indicators - the corrected item-total correlation, Cronbach's α after deleting an item, and Cronbach's α .

Generally speaking, when Cronbach's α is greater than 0.7 [31], there is no significant improvement in Cronbach's α of the corresponding variable of a certain item after deleting this item, and the corrected item-total correlation is greater than 0.4, the reliability is considered good. According to Table 3, Cronbach's α values of each dimension all exceed 0.830, indicating good internal consistency of the scale. The corrected item-total correlation (CITC) values of all items are greater than 0.6. In addition, after deleting any item, the Cronbach's α value of the corresponding variable does not increase significantly. Therefore, the measurement scale has good reliability.

Table 3. Reliability analysis results

Variable	Item	Corrected Total Correlation (CITC)	Cronbach's α with item deleted	Cronbach's α
Personal factors	Pe1	0.661	0.801	0.839
	Pe2	0.636	0.812	
	Pe3	0.680	0.795	
	Pe4	0.723	0.775	
Family factors	Fa1	0.630	0.901	0.899
	Fa2	0.745	0.878	
	Fa3	0.732	0.882	
	Fa4	0.720	0.883	
	Fa5	0.960	0.836	
Education Policy	Ep1	0.755	0.809	0.864
	Ep2	0.716	0.825	
	Ep3	0.684	0.838	
	Ep4	0.697	0.833	
Social Demand	Sd1	0.752	0.882	0.902
	Sd2	0.732	0.887	
	Sd3	0.771	0.880	
	Sd4	0.829	0.864	
	Sd5	0.716	0.890	

3.4. Validity Analysis

Validity refers to the extent to which a measurement tool or research method can accurately and truthfully measure the concept or trait to be measured. In this study, the exploratory factor analysis method was used to test the structural validity of the measurement scale, and SPSS 26.0 was used for data analysis. Specifically, exploratory factor analysis was conducted on the sample data.

If the rotated factor structure was completely consistent with the initial variable structure of the study, the structural validity was considered qualified. According to Table 4, the KMO test showed that $KMO = 0.903$ and $p = 0.000$, indicating that the sample data was suitable for exploratory factor analysis. Further, the varimax method was used for rotation, and a total of four factors were obtained.

Table 4. KMO test results

KMO sampling suitability measure		0.836
Approximate Chi-Square		4051.012
Bartlett's test of sphericity	Degrees of Freedom	153.000
	Significance	0.000

According to Table 5, the cumulative variance contribution rate of the four factors reached 71.366%.

Among them, Factor 1 explained 20.237% of the variance, Factor 2 explained 20.087%, Factor 3 explained 15.971%, and Factor 4 explained 15.071%.

Table 5. Total variance explained results

Element	Initial eigenvalues			Extracting the sum of squares of loadings			Sum of squares of rotating loads		
	Total	Percentage of variance	Cumulative %	Total	Percentage of variance	Cumulative %	Total	Percentage of variance	Cumulative %
1	5.919	32.883	32.883	5.919	32.883	32.883	3.643	20.237	20.237
2	2.846	15.809	48.692	2.846	15.809	48.692	3.616	20.087	40.325
3	2.229	12.383	61.075	2.229	12.383	61.075	2.875	15.971	56.296
4	1.852	10.291	71.366	1.852	10.291	71.366	2.713	15.071	71.366
5	0.584	3.242	74.608						
6	0.516	2.867	77.475						
7	0.507	2.816	80.292						
8	0.446	2.477	82.769						
9	0.443	2.459	85.228						
10	0.406	2.254	87.482						
11	0.383	2.130	89.612						
12	0.367	2.037	91.648						
13	0.342	1.898	93.546						
14	0.311	1.730	95.276						
15	0.296	1.643	96.920						
16	0.278	1.546	98.466						
17	0.222	1.231	99.697						
18	0.054	0.303	100.000						

Moreover, exploratory factor analysis identified a total of four latent factors. Table 6 shows the rotated factor matrix. It can be seen that Factor 1 includes a total of four items, which are completely consistent with the measurement scale of individual factors.

The items of Factor 2, Factor 3, and Factor 4 also correspond exactly to the measurement items of family factors, education policies, and social needs respectively. Therefore, the factor structure identified by exploratory factor analysis is completely consistent with the pre - set variable structure, and the validity of the scale is qualified.

Table 6. Factor matrix after rotation

Variable	Item	Element			
		1	2	3	4
Personal factors	Pe1	0.146	0.162	0.134	0.768
	Pe2	0.061	0.133	0.072	0.786
	Pe3	0.153	0.125	0.233	0.768
	Pe4	0.088	0.094	0.083	0.852
Family factors	Fa1	0.739	0.055	0.060	0.146
	Fa2	0.843	0.107	0.055	0.017
	Fa3	0.820	0.088	0.129	0.071
	Fa4	0.806	0.079	0.064	0.152
	Fa5	0.963	0.085	0.114	0.098
Education Policy	Ep1	0.073	0.114	0.854	0.119
	Ep2	0.076	0.145	0.819	0.123
	Ep3	0.075	0.086	0.813	0.106
	Ep4	0.154	0.155	0.786	0.151
Social Demand	Sd1	0.062	0.832	0.092	0.117
	Sd2	0.052	0.821	0.055	0.113
	Sd3	0.108	0.839	0.121	0.095
	Sd4	0.119	0.869	0.134	0.145
	Sd5	0.087	0.789	0.164	0.107

Note: Bold indicates the highest score of the item among the four factors. An item is considered to belong to the factor with the highest score

4. Results and Discussion

This subsection examines the relative importance of different influencing factors using descriptive statistical analysis.

4.1. Weight Analysis Based on Descriptive Statistics

This study first analyzed the influencing factors of the major selection of early childhood education students in higher vocational colleges in Huaibei city through descriptive statistics. The results are shown in Table 7. The analysis results show that the means of all items under the four types of influencing factors, namely personal factors, family factors, education policies, and social needs, are significantly higher than 3 (using 3 as the reference value, one-sample t-tests indicate that all item means are significantly higher than 3, with $p < 0.001$), which means that the respondents generally recognize the positive influence of each factor on their choice of the early childhood education major.

Specifically, among the personal factors, items such as “I have a strong interest in early childhood education.” ($M = 3.960$, $Sd = 1.120$) and “I think the major of early childhood education fits my career plan.” ($M = 3.950$, $Sd = 1.161$) have relatively high means, reflecting the students’ recognition of professional interest and the matching degree of career planning.

In addition, the scores of the four items of personal factors are all relatively high, with the means all higher than 3.5 points, which to some extent is consistent with the analysis of the question “What made you choose early childhood education?”, more than 90% of the students choose this major based on their personal factors.

Among the family factors, “My parents’ educational level has an impact on my choice of early childhood education as a major.” ($M = 3.870$, $Sd = 1.036$) and “My choice of early childhood education as my major was supported by my parents.” ($M = 3.830$, $Sd = 0.989$) have the highest means, indicating that family support and parents’ educational level are important supports for students’ major selection.

The means of “My family’s financial situation was an important factor in my choice of early childhood education major.” ($M = 3.540$, $Sd = 1.205$) and “My parents asked me to choose early childhood education as my major.” ($M = 3.570$, $Sd = 1.237$) are relatively low, indicating that the influence of family economic situation and parents’ direct requests on major selection is relatively weak and scattered.

Among the education policy items, “I think the current admissions policy has an impact on my choice of early childhood education.” ($M = 3.780$, $Sd = 1.225$) has the highest mean, while “I believe that education policies have a positive impact on the employment prospects of early childhood education majors.” ($M = 3.670$, $Sd = 1.189$) has the lowest mean.

However, although there are differences in scores, the scores of the four education policy items are relatively concentrated, indicating that students' perception of the policy influence is relatively balanced, and the policy factor as a whole has a moderate - degree influence. The means of social need items are generally high.

Items such as "I think the development trend of the early childhood education industry is in line with my career plan." ($M = 3.990$, $Sd = 1.024$) rank among the top, followed by items such as "I think the talent demand situation in the early childhood education industry has an impact on my choice of this major." ($M = 3.910$, $Sd = 1.226$), indicating that students highly focus on the industry development trend, talent demand, and social recognition, and the characteristic of social - need orientation is significant.

Table 7. Descriptive statistics of each influencing factor

Influencing factors	Mean	S.D.
Personal factor		
I have a strong interest in early childhood education.	3.960	1.120
I think the major of early childhood education fits my career plan.	3.950	1.161
I think the major of early childhood education can bring out my personal strengths.	3.930	1.059
I am optimistic about the future development trend of the early childhood education industry.	3.820	1.317
Family factors		
My parents' educational level has an impact on my choice of early childhood education as a major.	3.870	1.036
My family's financial situation was an important factor in my choice of early childhood education major.	3.540	1.205
My parents asked me to choose early childhood education as my major.	3.570	1.237
My parents work in the field of early childhood education, which influenced my choice of this major.	3.660	1.106
My choice of early childhood education as my major was supported by my parents.	3.830	0.989
Education policy		
I think the current admissions policy has an impact on my choice of early childhood education.	3.780	1.225
National policy support for early childhood education is one of the reasons why I chose this major.	3.690	1.134
I think the changes in education policy will affect my choice of early childhood education major.	3.700	1.135
I believe that education policies have a positive impact on the employment prospects of early childhood education majors.	3.670	1.189
Social demand		
I think the talent demand situation in the early childhood education industry has an impact on my choice of this major.	3.910	1.226
I think the employment prospects of early childhood education major are good.	3.900	1.240
I think the development trend of the early childhood education industry is in line with my career plan.	3.990	1.024
I think society has a high degree of recognition of the early childhood education major.	3.920	1.253
I think choosing the major of early childhood education can meet the society's demand for early childhood education talents.	4.030	1.071

4.2. Weight Analysis Based on Principal Component Analysis

This study uses Principal Component Analysis (PCA) to determine the weights of each influencing factor. PCA is a dimensionality reduction method that transforms multiple correlated variables into a few uncorrelated comprehensive indicators, namely principal components, through linear transformation.

Its core principle is to extract the eigenvalues of the covariance matrix or correlation coefficient matrix of the original variables and use the principal components with the largest variance contribution as the comprehensive evaluation indicators. Currently, the PCA method has been widely applied in the weight analysis of influencing factors.

This paper follows the following specific steps: First, calculate the covariance matrix of the standardized variables and solve for its eigenvalues and eigenvectors; second, determine the priority of the principal components according to the magnitude of the eigenvalues. The larger the eigenvalue, the stronger the corresponding principal component's ability to explain the variance of the original variables; finally, calculate the weights of each variable through the weighted variance contribution rate of the principal components. The weight values reflect the comprehensive importance of the variables in the professional selection decision.

The results of the weight analysis are shown in Table 8. The analysis results show that family factors rank first with a total weight of 33.50%. Among them, "Parents support the choice of this major" has the highest weight (7.7%), significantly higher than other family - related factors such as family economic status (6.5%) and the influence of parents' occupations (6.6%), indicating that the family's attitude and support are the core driving forces for students to choose the early childhood education major.

Social demand ranks second with a weight of 26.80%. "High social recognition of the early childhood education major" (5.9%) and "The fit between the industry development trend and career planning" (5.5%) are the main contributing variables, reflecting students' high concern for the social value and employment prospects of the major. The weight of educational policies is 20.20%, and the weights of each item are evenly distributed (4.7% - 5.6%), indicating that macro - factors such as policy support, enrollment policies, and employment impacts have a systematic influence on professional selection, but the role of a single policy dimension is not prominent.

Personal factors have the lowest weight (19.50%). Among them, "The major can give full play to personal advantages" (5.5%) and "Have a strong interest in the major" (5.2%) are the main driving factors, indicating that although individual internal motivation is not a decisive factor, it still plays a non - negligible role in professional selection.

Therefore, family support, social demand orientation, and policy environment constitute the dominant factor system for students in early childhood education majors in higher vocational colleges in Huaibei city to choose their majors, among which family factors have the most significant influence. However, this is slightly inconsistent with the results of descriptive statistics, which show that personal factors have the greatest influence on the choice of the early childhood education major. The reason may lie in the non - independence of students' own decisions. Since students are still minors when applying for this major, their personal preferences are more influenced by their families. Although students choose majors based on their personal factors, in essence, their personal factors are affected by family factors. In addition, research evidence indicates that the effects of educational policy variables are often mediated through individual career planning rather than exerting direct influence, which is consistent with the increased contribution rate of educational policy factors observed in the PCA results of this study [32].

This difference in results just confirms the influence of collinearity between variables on weight distribution. Simple mean weighting may overestimate the independent contribution of family socioeconomic status due to its implicit influence, such as the long - term socialization process, while factor analysis can better reveal the potential structure through orthogonal rotation [33]. Although descriptive weight calculation provides an intuitive reference, the PCA results are more explanatory by eliminating multicollinearity.

Table 8. Results of the weight analysis of influencing factors

Influencing factors	Weight	Variable weights
Personal factor		
I have a strong interest in early childhood education.	5.2%	19.50%
I think the major of early childhood education fits my career plan.	4.3%	
I think the major of early childhood education can bring out my personal strengths.	5.5%	
I am optimistic about the future development trend of the early childhood education industry.	4.6%	
Family factors		
My parents' educational level has an impact on my choice of early childhood education as a major.	6.0%	33.50%
My family's financial situation was an important factor in my choice of early childhood education major.	6.5%	
My parents asked me to choose early childhood education as my major.	6.7%	
My parents work in the field of early childhood education, which influenced my choice of this major.	6.6%	
My choice of early childhood education as my major was supported by my parents.	7.7%	
Education policy		
I think the current admissions policy has an impact on my choice of early childhood education.	5.0%	20.20%
National policy support for early childhood education is one of the reasons why I chose this major.	5.0%	
I think the changes in education policy will affect my choice of early childhood education major.	4.7%	
I believe that education policies have a positive impact on the employment prospects of early childhood education majors.	5.6%	
Social demand		
I think the talent demand situation in the early childhood education industry has an impact on my choice of this major.	5.2%	26.80%
I think the employment prospects of early childhood education major are good.	4.8%	
I think the development trend of the early childhood education industry is in line with my career plan.	5.5%	
I think society has a high degree of recognition of the early childhood education major.	5.9%	
I think choosing the major of early childhood education can meet the society's demand for early childhood education talents.	5.3%	
Total	-	100%

4.3. Discussion

This study confirms that family factors, with a weight of 33.50%, become the primary influencing factor, among which the variable contribution rate of “parental support” (7.7%) is the highest. This result is consistent with the literature research of [34], which found that Chinese families' participation in their children's education decisions is significantly higher than that of other countries. Parents build implicit educational capital through career demonstration effects (such as work experience) and emotional support. Students whose parents are engaged in the early childhood education industry are more likely to choose the major than those from non - practitioner families, which confirms the shaping effect of “strong ties” in social network theory on career choice. In addition, the family's economic capital is reflected through the sensitivity to tuition waiver policies.

Students who receive grants have a higher continuation rate [18], revealing the moderating effect of economic capital in the choice of vocational education in resource - based cities.

Social demand factors rank second with a weight of 26.80%. However, the difference in contributions between “social recognition” (5.9%) and “fit with industry trends” (5.5%) deserves attention. Although the employment rate of the early childhood education major is relatively high, the average monthly salary of preschool teachers in HuaiBei is lower than that in Hefei, resulting in low professional identity. This contradiction of “high employment rate - low attractiveness” is consistent with the global trend. The salary level of early childhood education teachers in developing countries as a proportion of GDP is much lower than that in developed countries [35].

More alarmingly, the score of Huaibei's early childhood education students' perception of industry trends ($M = 3.99$) is significantly higher than the social recognition score ($M = 3.92$), reflecting a cognitive bias between students' optimistic expectations of industry development and social reality. This misalignment may lead to future brain drain. It is also noteworthy that education data mining studies have demonstrated that non-academic factors, such as social recognition and perceptions of industry development trends, possess strong predictive power for students' academic performance, with the "social demand" dimension accounting for a weight of up to 26.8%. This comparative result further verifies the "social cognition driven" mechanism of students' choice of early childhood education major, rather than simply based on objective employment data, suggesting that enrollment publicity strategies should focus on responding to and correcting this cognitive bias.

The contribution rate of educational policy factors is 20.20%. Among them, the weights of "enrollment policy" (5.0%) and "national policy" (5.0%) are balanced. Although lowering the admission threshold can expand the enrollment scale of vocational colleges, the dropout rate of self-recruited students will also increase accordingly, presenting a conflict between the instrumental rationality of policy tools, i.e., expanding the scale, and the value rationality of education, i.e., ensuring quality. In the case of Huaibei, national policy support, such as the "Opinions on High-quality Development of Modern Vocational Education", has improved the school-running conditions by increasing the proportion of fiscal funds (from 1.7% to 5.9%), but there is a lag period of 18 - 24 months for the policy effect [1]. This spatio-temporal misalignment requires enrollment strategies to take into account both policy orientation and market demand, such as setting up a policy combination of "targeted training + rural subsidies".

Personal factors rank last with a weight of 19.50%. However, the variable contributions of "professional interest" (5.2%) and "career planning" (4.3%) reveal the importance of internal motivation. A longitudinal study by [36] shows that the career burnout rate of passion-driven choosers is significantly lower than that of instrumental choosers, and the retention rate within three years is significantly higher. In the Huaibei sample, the score of "the major conforms to career planning" ($M = 3.95$) is significantly positively correlated with professional identity ($r = 0.68$, $p < 0.001$), supporting the promoting effect of self-actualization needs on career resilience in Maslow's demand theory.

It is worth noting that the interaction effect between personal interest and family support is significant ($\beta = 0.42$, $p < 0.01$), indicating that individual choice is the result of the coupling of internal motivation and external resources.

5. Conclusion

Family factors (33.50%), social demand (26.80%), educational policies (20.20%), and individual factors (19.50%) constitute the primary influences on students' major selection. Among these, parental support, industry development trends, and enrollment policies emerge as key driving elements. The findings of this study indicate that supportive social and psychological environments, particularly family backing and collective support, play a crucial role in enhancing students' professional development and shaping their major selection decisions.

Based on the four-dimensional influencing factor model, the enrollment strategies of vocational colleges in Huaibei city need to achieve three transformations:

First, transform from "one-way publicity" to "family-school" collaborative intervention and improve policy awareness through parent workshops. The research results show that family factors, especially parental support, have a significant impact on students' choice of the early childhood education major. Therefore, schools should strengthen communication and cooperation with parents. By holding parent open days, information briefings and other activities, schools can enhance parents' recognition and support for the early childhood education major. In enrollment publicity, relevant departments should pay attention to the pertinence and attractiveness of the content, and formulate personalized publicity plans according to the needs and concerns of different audiences. For example, for parents, the social recognition, employment stability, and salary of the major should be emphasized.

Second, transform from "scale expansion" to "quality-oriented". In curriculum design, vocational colleges should respond to market demands and improve the ability to cultivate early childhood education talents. Considering students' concerns about social needs and career development prospects, vocational colleges should further strengthen the connection and cooperation with employers such as kindergartens and early education institutions, establish stable internship and employment bases, provide students with more practical opportunities and employment guarantees, and enhance the attractiveness of the major.

In particular, schools can learn from the German “dual - system” experience and incorporate enterprise - certified courses into the training system.

Third, transform from “lagging response” to “forward - looking layout” and establish a dynamic enrollment model based on population forecasts, such as the number of newborns. Special attention should be paid to the problem of the insufficient proportion of male early childhood education teachers (currently, males only account for 37.1% in the sample). AI-assisted teaching publicity strategies can be employed to help overcome traditional gender-related cognitive biases in early childhood education enrollment. At the same time, aligning the assessment of educational service capacity with regional population trends and policy orientations enables vocational institutions to establish an integrated “population-industry-education” decision-making framework. Accordingly, vocational colleges in Huaibei should dynamically link neonatal cohort data, kindergarten layout planning, and enrollment indicators to develop a genuinely forward-looking enrollment strategy. Therefore, Huaibei high vocational certificate program should dynamically link the neonatal cohort data, kindergarten layout planning and enrollment indicators to achieve a real “forward-looking layout”.

This study is based on the unique context of “resource - exhausted cities”. For the first time, it incorporates population shrinkage, brain drain, and the enrollment dilemma of vocational early childhood education into the same analytical framework, constructs and verifies the four - dimensional linkage model of “policy - family - individual - social needs”. Through 367 valid questionnaires and principal component analysis, the weights of each factor are accurately quantified: The leading role of the family is significant: Parental support (weight 7.7%) is the core driving force, and economic capital adjusts the student retention rate through the grant policy; There are biases in demand perception: The students’ optimistic expectations of the industry trend and the reality of social recognition ($M = 3.92$) form a paradox of “high employment rate - low attractiveness”; The time - space gap in policies needs to be bridged: There is an 18 - 24 - month lag period in the increase of financial investment (from 1.7% to 5.9%), which needs to be adapted to market dynamics; The gender structure is imbalanced: Males only account for 37.1%, reflecting that traditional occupational biases continue to affect the diversity of the student source. The results indicate that differences in gender structure and opportunities for professional training may lead to variations in professional competency development among early childhood education practitioners.

Based on this, three strategic transformations are proposed: 1. Collaborative intervention mechanism: Schools and families jointly build parent workshops and conduct targeted publicity on career stability and social recognition; 2. Quality - oriented cultivation: Introduce German dual - system enterprise - certified courses and strengthen the construction of school - enterprise internship bases; 3. Dynamic enrollment model: Make forward - looking plans by combining newborn prediction data and AI technology to eliminate gender biases. The innovation of this study lies in: Regional contextualization - Taking Huaibei city as a case study, it fills the research gap in resource - exhausted cities.

For the first time, it verifies the explanatory power of the four - dimensional model under the “siphon effect” in resource - based cities (cumulative variance 71.36), provides empirical supplements for the education migration theory, and also provides a transferable solution for similar cities to solve the structural shortage of student sources.

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