THE IMPACT OF EMPLOYMENT ABILITY ON JOB SELECTION EFFICACY OF GRADUATES AT INTERNET OF THINGS MAJOR IN TIANJIN ELECTRONIC INFORMATION COLLEGE, CHINA

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Abstract: This study aimed to analyze the basic overview of graduates' employment ability and job selection efficacy at Internet of Things Major in Tianjin Electronic Information College in China, including comparing graduates' employment ability and job selection efficacy under different demographic backgrounds. 252 questionnaires were distributed by convenient sampling. Difference statistics were carried out by descriptive statistics, t-test and one-way ANOVA analysis, and Pearson correlation analysis and regression analysis were used for statistical investigation. Regarding the employment ability of graduates at Internet of Things Major in Tianjin Electronic Information College, the mean was higher for male students, bachelor's degree students with parents, whether to serve as a student cadre or not, and students from rural areas. Male students, students whose parents had bachelor's or master's degrees or above, student cadres, and students from rural areas had higher means of job selection efficacy. The employment ability of graduates at Internet of Things Major in Tianjin Electronic Information College was significantly positively correlated with their job selection efficacy. There was a significant positive correlation between employment ability and job selection efficacy, and employment ability positively impacted job selection efficacy.

Keywords: Graduate, Internet of Things Major, Employment Ability, Job Selection Efficacy

Introduction

According to the report "Spectrum for the Internet of Things" released by the Global System for Mobile Communications (GSMA), it was estimated that the global Internet of Things market reached 4 trillion US dollars by 2025, and the compound annual growth rate of the worldwide Internet of Things market was 16.22% from 2015 to 2025. The latest report released by international market research institutions, Markets, and Markets, showed that the global Internet of Things market was about 150 billion US dollars in 2019 and is expected to increase to 243 billion US dollars by 2021(Mcclelland

et al., 2022). As the market entered an explosive period, the Internet of Things became another trillion-dollar high-tech industry under globalization (Chen, 2022).

The Chinese government had clearly defined the national strategic position of the Internet of Things in the Three-Year Action Plan for the Construction of New Infrastructure of the Internet of Things (2021-2023), creating a favorable policy environment for the development of the Internet of Things. Further, it promoted the research and development of Internet of Things technology, the training of Internet of Things talents, and the rapid growth of the Internet of Things industry (Peng & Han, 2021). In recent years, the Ministry of Science and Technology, the Ministry of Industry and Information Technology, the National Development and Reform Commission, and local governments at all levels have actively promoted the development of the Internet of Things. The explosive market power of China's Internet of Things industry has continuously attracted the attention of famous industrial giants such as Huawei and Haier. These industrial giants issued Internet of Things development strategies for their industrial chains and invested many funds (Wang & Li, 2019).. Therefore, there was a massive gap in demand for talent in this field, and the focus on the supply side of education for professional skills in higher education institutions was significant.

China's educational mechanism has gradually changed from higher education to a vocational education training mechanism to train new talents and new forces better to meet the needs of China's economic construction (Ni, 2023). Facing the employment trend of the current social environment, students in different higher vocational colleges had different feelings of pressure. Some students could keep a relatively stable mind, while others avoided it. Employment pressure was not only related to the employment situation of the whole society (Isa et al., 2020) but also closely related to a series of activities such as vocational college students' career choices. At the same time, the higher education received by higher vocational college students was not equal to high-quality education, which makes the actual working ability of higher vocational college graduates slightly insufficient in the current competitive recruitment market. Therefore, the issue of employment difficulties for graduates at Internet of Things Major in Tianjin Electronic Information College should be explored comprehensively from the perspectives of students themselves and the external environment.

Many research results showed that the most significant factor affecting the job selection effectiveness of higher vocational college students was job selection efficacy. To a certain extent, job seekers' self-confidence in job selection activities was more important than their abilities. Job selection efficacy would not only directly or indirectly impact their job selection and development direction (Xing et al., 2023), but also affect job seekers' attitudes and views on careers. Students who believed they could complete various career tasks had a higher job selection efficacy. Their probability of achieving employment was higher and, vice versa, lower (Fan, 2022). It could be said that job selection efficacy was the internal presentation of comprehensive qualities such as professional ability, general skills, and

personal attributes, and employment ability significantly positively impacted job selection efficacy (Huang et al., 2018). Based on this, it was essential to investigate how to help students majoring in the Internet of Things in Electronic Information College change their feelings about employment pressure, so that students in higher vocational colleges could complete their studies with a better attitude in the process of choosing jobs, and achieve two-way optimization in the choice of career development direction. This study took this as the core of research. It investigated the dynamic changes in employment ability and career-seeking efficacy of students majoring in the Internet of Things in job hunting and the correlation between them, hoping to help improve the job selection efficacy of students majoring in the Internet of Things (Tang, 2022).

Research Objectives

1) To understand the employment ability and job selection efficacy of graduates at Internet of Things Major in Tianjin Electronic Information College in China.

2) To analyze the differences in employment ability and job selection efficacy among graduates at Internet of Things Major in Tianjin Electronic Information College in China under different demographic backgrounds.

3) To determine the correlation between the employment ability and job selection efficacy of graduates at Internet of Things Major in Tianjin Electronic Information College in China.

4) To determine the impact of employment ability on the job selection efficacy of graduates at Internet of Things Major in Tianjin Electronic Information College.

Literature Review

Research on Students' Employment Ability

The definition of employment ability by Hillary & Pollard (1998) was quite authoritative and widely referenced and cited by researchers. They pointed out that employment ability was obtaining initial employment, maintaining employment, and bringing new employment when necessary. Furthermore, employment ability was the ability of individuals to effectively unleash their potential in the labor market through stable employment.

Researcher Zhu et al. (2010) suggested that an individual's employment ability referred to the opportunity to secure employment in the job market. Zheng (2010) put forward his understanding of employment ability: individuals could be competent for work through learning. Yang & Xiong (2014) proposed that employment ability was the ability of employees to maintain attractiveness and competitiveness in the labor market. It mainly included the ability to foresee work tasks and environmental changes, as well as the ability to respond to changes.

Research on the measurement and influencing factors of students' employment ability. Chen

(2012) classified employment ability into general skills, professional knowledge and skills, personal qualities, and career plan formulation abilities, and believed each ability was interrelated. Ma & Liang (2016) divided employment ability into hard and soft, including knowledge and skills, self-management, competence, leadership, career plan formulation, and social adaptability.

Bao & Liu (2016) found that individual personality traits, professional knowledge and skills, and transferability were the main dimensions of graduates' employment ability and proposed that communication, professional quality, and problem-solving ability were the core elements of graduates' initial employment. Peng (2014) divided employment ability into obtaining and maintaining employment. Obtaining employment ability included self-marketing, knowledge, plan formulation and organization, and communication. Maintaining employment ability had self-management, scientific thinking, a sense of responsibility, self-confidence, and information acquisition and utilization.

In China, some scholars analyzed the impact on employment ability from the perspective of individual and college characteristics. Many studies showed that family background, personal characteristics, and college organizational characteristics would significantly impact the formation of students' employment ability. Through investigating 141 college graduates, Li (2012) concluded that political outlook, educational level, student cadre level, employment guidance, and other factors would significantly impact college students' employment ability. Still, there was no significant difference in gender, age, school type, and professional category. Through empirical research, Yang (2014) found that dual teacher quality teachers positively impacted students' knowledge application and social adaptation ability by improving teaching quality and strengthening extracurricular employment assistance. However, there were still many imperfections in dual teacher quality teachers, and vocational colleges needed to establish and improve management, evaluation, incentive, and constraint mechanisms for dual teacher quality teachers. Yue & Zhang (2014) put forward that the school-enterprise cooperation mode was an effective mechanism to break through the bottleneck of the development of higher vocational colleges, and the cultivation of students' employment ability was the common goal of both schools and enterprises in school-enterprise cooperation.

Research on Student Job Selection Efficacy

Betz & Taylor (1983) stated that job selection efficacy was "the level of confidence of individuals in successfully participating in related tasks such as career choice and commitment." They believed job selection efficacy referred to self-confidence in completing career choices and tasks. Peng & Long (2001), based on the definition of Taylor & Betz and combined with their research conclusions, believed that job selection efficacy referred to the confidence level of individuals in their career-choosing ability and their professional ability to complete a specific job.

The research object was also college students' job selection efficacy. Liu & Jiang (2018) thought that the combination of college students' career choice ability, career competence, and self-

evaluation ability to meet career requirements was college students' job selection efficacy. Based on this analysis, college students' job selection efficacy was influenced by internal factors such as individual self-awareness and self-evaluation and external factors such as career requirements.

Huang et al. (2020) argued that job selection efficacy was an individual's belief in his ability and career goals when facing job selection. In career choice, individual self-confidence in their professional ability level and the consistency between their majors and career goals would be reflected in the level of job selection efficacy. In summary, unlike job selection efficacy, job selection efficacy belongs to the process of career choice efficacy.

Research on measurement and influencing factors of students' job selection efficacy. The Career Decision Self Efficacy Questionnaire (CDMSE) developed by Taylor & Betz (1983) was a measurement questionnaire for job selection efficacy, widely used in the global research community. The questionnaire measures career decision-making self-efficacy from five dimensions: self-evaluation, information collection, goal selection, plan formulation, and problem-solving. Integrating the final measurement data could determine individual career decision-making self-efficacy.

Some scholars believed that factors from individuals themselves impacted job selection efficacy. Wolfe & Betz (2011) pointed out through research that the influence of age difference on job selection efficacy almost does not exist in terms of demographic variables. Still, with the grade change, the level of job selection efficacy would change. Zhang (2017) found that the job selection efficacy of higher vocational students was generally not high, located in the middle of Chinese college students, and there were apparent differences in demographic variables such as age, gender, birthplace, and other factors. Ni (2018) believed that family factors were an important factor affecting an individual's job selection efficacy. He points out that the influence of family could impact an individual's life choices, including career choices. Through empirical research and questionnaire surveys, it was found that college students' job selection efficacy was good, belonging to the upper-middle level, and there were apparent differences in grade, family economy, and other dimensions.

Hu & Xie (2019) found that professional values and psychological capital were positively correlated with Tibetan college students' job selection efficacy. In addition, psychological capital could also play an intermediary role in studying intermediary factors. Therefore, they said that guiding Tibetan college students to establish correct professional values, improve their psychological capital, and enhance their self-efficacy could improve their job selection efficacy.

Xiao (2021) concluded in the research that he could clearly understand his professional ability and professional needs in practical work, obtain first-hand professional information, and then screen and match his more suitable professional goals. This trained college students' ability to solve problems and overcome difficulties in real career situations. In addition, the predecessors met in the workplace would also provide many indirect experiences for college students to refer to, which were crucial to

improving their job selection efficacy.

Research on the Relationship between Students' Employment Ability and Job Selection Efficacy

With the progress of social economy and science and technology, the employment dilemma of college students gradually became prominent, and the requirements for their abilities increased, which seriously negatively impacted their physical and mental health. When studying the employment ability of college students, Xu (2016) also introduced self-efficacy. They analyzed the relationship between the two, hoping to enhance their job selection efficacy and employment ability, thus comprehensively and profoundly improving their physical and mental health.

Job selection efficacy was the primary influencing factor of college students' employment. Job selection efficacy not only affected college students' job selection efficacy direction but also influenced college students' mentality and handling methods when facing jobs and a series of employment problems (Wang & Zuo, 2018). If college students had a high level of self-efficacy in job selection efficacy and were full of confidence in their choosing jobs, the higher the success rate of employment was, and vice versa (Wei, 2021).

Hu & Xie (2019) pointed out that self-efficacy was closely related to the individual's successful emotional experience. A more comprehensive evaluation of self could objectively evaluate one's abilities and advantages, accurately match suitable jobs, and screen the best career goals. Moreover, increasing internship opportunities gave seniors many ways to accumulate practical experience. The employment direction and career choice gradually became clear, and clear targeting was very beneficial to improving job selection efficacy.

The current research on employment ability and job selection efficacy was insufficient, and the role of employment ability and job selection efficacy in college student's career choice and employment plan formulation should be paid attention to (Pattnaik & Shukla, 2022). This study on the relationship between job selection efficacy and employment ability of college students majoring in the Internet of Things found that the number of empirical studies on the relationship between them was insufficient, and the research content involved was not comprehensive and in-depth.

Methodology

This survey was aimed at the graduates of the Internet of Things Major at Tianjin Electronic Information College, China. Our school had 755 students majoring in the Internet of Things (2022-2023). According to the survey number based on the overall size of the Morgan Table Group, 252 graduating class students were sampled in this major to conduct a questionnaire survey, and each student was explained collectively before filling out the questionnaire to ensure the effectiveness of the recovery rate. Finally, 260 questionnaires were distributed, and 252 valid questionnaires were retained after

screening out invalid questionnaires. The effective return rate reached 96.92%.

The Employment Ability Scale adopted the Self-rating Scale of Employment Ability, revised by Cheng (2014), which contained 26 questions. Among them, it included self-development ability, interpersonal communication ability, employment self-confidence, practical ability, and adaptability. The overall Cronbach's α of the questionnaire was 0.913, which was greater than 0.9, indicating that the overall reliability of the employment ability questionnaire was extremely high. The KMO value and Bartlett's sphericity test in terms of validity indicated suitability for factor analysis. The factor load of each question was between 0.659 and 0.801, all greater than 0.45, which showed that the questionnaire had good structural validity. CFI, NFI, and GFI were all greater than 0.9, and the standardized RMSEA 0.041 was less than 0.05, which showed an excellent fitting degree.

Job Selection Efficacy Scale adopted Long's (2003) Vocational College Student Job Selection Efficacy Scale, consisting of 25 questions and five dimensions, including self-evaluation, information collection, target filtering, plan formulation, and problem-solving. The Cronbach's α were all greater than 0.8, indicating that the overall reliability of the questionnaire was extremely high, indicating a high level of reliability. The correlation coefficient between each item and the total score of the subscale ranged from 0.58 to 0.73. KMO value and Bartlett sphericity test showed that factor analysis was suitable for validity. CFI, NFI and GFI were all greater than 0.9, and the standardized RMSEA 0.043 was less than 0.05, which showed that this questionnaire had good reliability and validity.

Results

Demographic Analysis of Questionnaire Participants

This study surveyed the graduates at the Internet of Things Major in Tianjin Electronic Information College and ultimately collected, organized, and confirmed 252 valid questionnaires. Demographic backgrounds included gender, parents' highest educational level, student cadres, and birthplace. In terms of gender, there were 125 males, accounting for 49.6%, and 127 females, accounting for 50.4%. The gender ratio of the students surveyed was relatively balanced. Regarding parents' highest educational background, there were 144 students with higher vocational education or above, accounting for 57.1%, 77 students with a bachelor's degree, accounting for 30.6%, 31 students with a master's degree and above, accounting for 12.3%. Parents of students with higher vocational education or above accounted for the majority. In terms of student cadres, there were 69 student cadres, accounting for 27.4%, 183 non-student cadres, accounting for 72.6%, and student cadres, accounted for 1/4 to 1/3, which was in line with the actual situation. In terms of birthplace, there were 110 students in urban areas, accounting for 43.7%, and 142 students in rural areas, accounting for 56.3%.

Descriptive Statistics on the Levels of Employment Ability and Job Selection Efficacy

1) The mean employment ability of graduates was 3.409, at a moderate level. The means of

self-development ability, interpersonal communication ability, employment self-confidence, practical ability, and adaptability were 3.480, 3.512, 3.448, 3.348 and 3.258 in turn, among which the mean of interpersonal communication ability was the highest, followed by self-development ability and employment self-confidence, as Table 1 shows.

Table 1: Descriptive Statistical Analysis of Employment Ability among Graduates

Dimension	N	M	SD	Interpretation
Self-development ability	252	3.480	0.516	Moderate
Interpersonal communication ability	252	3.512	0.562	High
Employment self-confidence	252	3.448	0.507	Moderate
Practical ability	252	3.348	0.524	Moderate
Adaptability	252	3.258	0.563	Moderate
Overall employment ability	252	3.409	0.466	Moderate

2) The overall job selection efficacy of graduates was 3.543, which was high. The means of the five dimensions: self-evaluation, information collection, target filtering, plan formulation, and problem-solving were 3.750, 3.493, 3.631, 3.457, and 3.383 in turn, among which the mean of self-evaluation was the highest, followed by target filtering and information collection, while the mean of problem-solving was the lowest. Therefore, graduates' overall job selection efficacy at Internet of Things Major in Tianjin Electronic Information College was high, with the highest mean in self-evaluation and the lowest in problem-solving, as shown in Table 2.

Table 2: Descriptive Statistical Analysis of Job Selection Efficacy among Graduates

Dimension	N	M	SD	Interpretation
Self-evaluation	252	3.750	0.703	High
Information collection	252	3.493	0.670	Moderate
Target filtering	252	3.631	0.703	High
Plan formulation	252	3.457	0.622	Moderate
Problem-solving	252	3.383	0.695	Moderate
Overall job selection efficacy	252	3.543	0.532	High

Differences Analysis on the Levels of Employment Ability and Job Selection Efficacy Compared with Demographic Backgrounds

There were significant differences in demographic backgrounds of employment ability and job selection efficacy. There was a significant gender difference in the employment ability and job selection efficacy of graduates at Internet of Things Major in Tianjin Electronic Information College, with males being higher than females. There was a significant difference in the employment ability and job selection efficacy of graduates with the highest educational background of their parents, and students with a bachelor's degree were significantly higher than those with higher vocational educational

background or below. There were significant differences in employment ability and job selection efficacy among student cadres, and student cadres were significantly higher than non-student cadres. There was a substantial difference in employment ability and job selection efficacy of graduates from different birthplaces, with students from urban areas being significantly lower than those from rural areas.

Correlation Analysis among Employment Ability and Job Selection Efficacy

In this study, the Person correlation coefficient is used to analyze whether there is a correlation between employment ability and job selection efficacy. It was found that there was a positive correlation between employment ability and job selection efficacy as shown in Table 3.

Table 3: Summary of Correlation Analysis of Variables

	Correlation	Job Selection Efficacy
Employment Ability	Correlation Coefficient	0.679**
	P value	0.000

Regression Analysis among Employment Ability and Job Selection Efficacy

Table 4: Regression Analysis Results

Dependent variable	Independent variable	*B*	*SE*	*Beta*	*T*	*P*	R^2	$\triangle R^2$	*F*
Overall job selection efficacy	(Constant)	.842	.181		4.654	.000	.707	.489	49.073
	Self-development ability	.073	.073	.071	1.006	.315			
	Interpersonal communication ability	-.016	.070	-.017	-.228	.820			
	Employment self-confidence	.378	.082	.360	4.608	.000			
	Practical ability	.337	.083	.332	4.061	.000			
	Adaptability	.021	.070	.022	.303	.762			

It could be seen that the five dimensions of graduates' employment ability, such as self-development ability, interpersonal communication ability, employment self-confidence, practical ability and adaptability, were taken as independent variables at the same time, and the overall job selection efficacy was taken as dependent variables. The regression analysis showed that the F value was 49.073, $p < .001$, which showed that the regression equation was significant. Among them, employment self-confidence ($t=4.608$, $p < .001$) and practical ability ($t=4.061$, $p < .001$) entered the regression model, which showed that employment self-confidence and practical ability could positively predict the variation of graduates' job selection efficacy. The overall relevant situation is shown in Table 4.

Discussion

Current Employment Ability and Job Selection Efficacy of Graduates

The overall employment ability of graduates at the Internet of Things Major in Tianjin Electronic Information College was moderate, with the highest interpersonal communication ability and the lowest adaptability, which might be related to the course design and training objectives of the Internet of Things major. The training objectives might have focused more on applying technology than cultivating comprehensive qualities. At the same time, although interpersonal communication ability has been trained, the lack of practical experience might have led to poor adaptability of graduates in the face of changes and challenges in practical work. It was analyzed that graduates' self-efficacy in choosing jobs was generally at an upper-middle level, among which the reasons for the highest self-evaluation and the lowest problem-solving might be related to self-cognition and confidence. Graduates have had higher cognition and confidence in their ability and orientation, so the mean of self-evaluation was higher. It indicated that graduates have had a certain level of confidence in their professional knowledge and skills and a positive understanding of their values and abilities.

Differences in Employment Ability and Job Selection Efficacy among Graduates with Different Demographic Backgrounds

Gender differences showed that males had higher employment ability than females, which might have been related to traditional social beliefs and gender role positioning, which might have been related to differences in career expectations, self-evaluation, and self-confidence between males and females. The research results of Hu & Xie (2019) showed that male students had a higher ability to choose a career. Socio-cultural background might have also affected men's and women's sense of career choice efficacy. For example, society might have had higher expectations of males in family and career, making males more motivated and confident in choosing jobs.

The difference in parents' highest educational backgrounds showed that it might have been because highly educated families paid more attention to education and were more likely to provide their children with a good education and growth environment. In addition, it indicated that family background and educational resources significantly impacted the job selection efficacy of graduates. The higher the level of parents' education, the more likely they were to attach importance to their children's education and career development and provide more guidance and support.

Student cadres difference showed that student cadres had strong employment ability, which might have been because student cadres, through organization, coordination, and management, had more training opportunities. The experience and skills of student cadres might have better met the needs of some enterprises, thereby improving their employment competitiveness.

The difference in students' birthplace showed the uneven distribution of educational resources and opportunities between urban and rural areas. Students in rural areas might have cherished and

strived to improve their abilities more due to limited access to educational resources and opportunities. In addition, students in urban areas might have faced more temptations and choices, leading to insufficient attention in career plan formulation and employment preparation.

Relationship between Employment Ability and Job Selection Efficacy of Graduates

The results showed that graduates with high job selection efficacy had clear career plans and goals, knew what jobs they wanted to pursue, and were confident to achieve them. Clear career goals could make graduates more targeted in job hunting and improve the probability of successful employment (Zhao, 2016). What's more, the results also found graduates with high job search efficacy might know more about job search strategies and skills, how to show their advantages in the recruitment process, and how to communicate effectively with employers. These skills could help graduates stand out and improve their competitiveness in the job search process. Faced with the challenges and changes in the job market, graduates with high job selection efficacy might be more optimistic and have strong adaptability (Wang & Zuo, 2018).

Impact of Employment Ability on Job Selection Efficacy among Graduates

Employment self-confidence reflected an individual's perception of their abilities and positioning. When graduates had a high level of confidence in their professional skills and job selection abilities, they were more likely to believe that they were competent in the job and exhibit a positive attitude and behavior during the job search process. This confidence could help graduates better cope with the challenges of the job market, thereby improving their job selection efficacy. Practical ability reflected an individual's ability to operate and solve problems in practical work scenarios. These performances could enhance the job selection efficacy of graduates and make them more confident in finding a job that suits them.

Conclusions

1) The employment ability of graduates at Internet of Things Major in Tianjin Electronic Information College was generally moderate, with the highest interpersonal communication ability and the lowest mean adaptability. The overall job selection efficacy of graduates was high, with the highest mean self-evaluation and the lowest mean problem-solving.

2) There was a significant gender difference in the employment ability of graduates at Internet of Things Major in Tianjin Electronic Information College, with males being higher than females. There was a significant difference in the employment ability of graduates with the highest educational background of their parents, and students with a bachelor's degree were significantly higher than those with higher vocational educational background or below. There were significant differences in interpersonal communication ability, practical ability, and adaptability among student cadres, and student cadres were significantly higher than non-student cadres. There was a substantial difference in

the employment ability of graduates from different birthplaces, with students from urban areas being significantly lower than those from rural areas. There was a significant gender difference in job selection efficacy among graduates at Internet of Things Major in Tianjin Electronic Information College, with males significantly higher than females. There was a significant difference between parents' highest educational background and graduates' job selection efficacy. Students with a master's degree and above were significantly higher than students with higher vocational education or above, and students with a bachelor's degree were significantly higher than students with higher vocational education or above. There was a significant difference in the job selection efficacy of graduates among student cadres, with student cadres being significantly higher than non-student cadres. There was a significant difference in the employment efficacy of graduates from different birthplaces, with students in urban areas being significantly lower than those in rural areas.

3) The employment ability of graduates at Internet of Things Major in Tianjin Electronic Information College was significantly positively correlated with their job selection efficacy.

4) There was a significant positive correlation between employment ability and job selection efficacy of graduates at Internet of Things Major in Tianjin Electronic Information College, and employment ability had a positive predictive impact on job selection efficacy.

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