A Study on the Employment Status of Vocational College Graduates in the Era of Artificial Intelligence

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Abstract

Artificial intelligence (AI) is changing the kinds of jobs available and the skills expected from new employees. These changes are especially relevant to vocational education, where training is closely tied to workplace needs. This paper examines the employment situation of vocational college graduates and considers whether AI literacy, practical skills, and adaptability are related to employability. A questionnaire was distributed to 320 graduating students from five vocational colleges, and 298 usable responses were returned (93.1%). Descriptive statistics, correlation analysis, and multiple regression were used to analyze the data. All three factors were positively related to employability, but practical skills showed the largest effect. The findings are discussed in relation to vocational training and the changing requirements of the labor market.

Keywords

Artificial intelligence; vocational schools; vocational education; empirical research.

1. Introduction

AI is now used in many parts of production and service work. Machine learning, data analysis, language-processing tools, computer vision, and automated systems have changed how some tasks are carried out and how work is organized. Routine work is particularly easy to automate. At the same time, new jobs have appeared around digital systems, data, and human-machine cooperation. As a result, employers are paying more attention to whether workers can use new technologies and learn as job requirements change.

These changes create a mixed situation for graduates of higher vocational colleges [1]. Their training usually gives them an advantage in hands-on work, technical operation, and task execution. Such experience can help them enter front-line production and service positions quickly. The difficulty is that job requirements are no longer fixed. When technologies change, graduates may also need a stronger theoretical base, knowledge outside their original specialty, and the ability to learn new tools on their own. Weaknesses in these areas can make later career adjustment more difficult.

Employer expectations have also shifted. Having one occupational skill is often not enough for positions that involve digital equipment or intelligent systems. Besides practical competence, employers may look for familiarity with AI tools, basic data skills, problem-solving ability, communication across different fields, and a willingness to keep learning. For vocational students, this means that practical training is still important, but it needs to be accompanied by skills that allow graduates to work in a more digital workplace.

Much of the existing research on vocational employment has dealt with broad issues such as employment outcomes, curriculum design, and skills training [2-4]. Fewer empirical studies have looked specifically at how AI-related changes affect the employability of vocational college graduates. In particular, there is limited evidence on the relative roles of AI literacy, practical skills, and adaptability. The present study addresses this question with survey data from

graduating students. Rather than treating employability as a single outcome with one cause, the analysis compares the contribution of these three factors and considers what the results mean for vocational training.

2. Literature Review

2.1. Employability

Employability is not limited to whether a graduate can obtain a first job. It also concerns whether that person can use existing skills at work, respond to changes, and continue developing after entering employment. Hillage and Pollard describe employability in terms of assets, the use of skills, personal presentation, and personal circumstances. For vocational college graduates, the practical side of this concept is particularly important because their education is designed around occupational tasks. In this paper, employability is therefore understood mainly as the capacity to apply knowledge and skills, deal with workplace problems, and remain able to develop as work changes.

2.2. Artificial Intelligence and Employment

The effect of AI on employment is not entirely positive or negative. In some industries it raises productivity, reduces repetitive work, and creates jobs related to data, system operation, and digital services. In other settings, the same technology can replace tasks that were previously completed by workers. The pressure is greater in jobs built around repetitive procedures and among workers who have limited digital skills. For new graduates, the important issue is therefore not simply whether AI creates or removes jobs, but whether they are prepared for the kinds of work that remain or emerge.

2.3. Research Hypotheses

Based on previous research, this paper proposes the following hypotheses:

H1: Artificial intelligence literacy has a significant positive impact on employability;

H2: Practical skills have a significant positive impact on employability;

H3: Adaptability has a significant positive impact on employability.

3. Research Design

3.1. Questionnaire Design

The questionnaire had two sections. The first asked for background information, including gender, major, internship experience, and employment status. The second contained items on AI literacy, practical skills, adaptability, and employability. Responses were recorded on a five-point Likert scale from 1 (“strongly disagree”) to 5 (“strongly agree”).

3.2. Sample Description

The survey involved graduating students from five higher vocational colleges. Respondents were selected through stratified sampling followed by random distribution of the questionnaires. Of the 320 questionnaires distributed, 298 remained after incomplete or unusable responses were removed, giving a valid response rate of 93.1%. Internship experience was common in the sample. Thus, most respondents had some contact with an actual work setting before completing the questionnaire, which was useful when they evaluated their own practical ability and employability.

Table 1. Sample Characteristics

Variable	Category	Frequency	Percentage
Gender	Male	157	52.7%
	Female	141	47.3%
Major	Engineering	116	38.9%
	Business	93	31.2%
	IT	89	29.9%
Internship	Yes	241	80.9%
	No	57	19.1%

3.3. Reliability Analysis

Internal consistency was checked with Cronbach's α. The reported α values for AI literacy, practical skills, adaptability, and employability were 0.84, 0.87, 0.82, and 0.91, respectively, while the coefficient for the full scale was 0.90. Each value was above 0.7. On this basis, the items within the scales showed an acceptable level of consistency for the subsequent analysis.

Table 2. Reliability Analysis

Variable	Cronbach's Alpha
AI Literacy	0.873
Practical Skills	0.891
Adaptability	0.846
Employability	0.882

3.4. Variable Measurement

Dependent variable:

Employability (Y)

Independent variables:

AI Literacy (X1)

Practical Skills (X2)

Adaptability (X3)

Regression model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

4. Empirical Analysis

4.1. Descriptive Statistics

Descriptive statistics were first calculated for the four variables. Their mean scores fell between 3.52 and 3.89, which places the responses around the middle-to-upper part of the five-point scale [5]. Practical skills had the highest mean (M = 3.89). This is not unexpected for students in vocational programs, where a large share of training is practice based. AI literacy averaged 3.74, and employability averaged 3.68. Adaptability had the lowest mean, at 3.52. The gap was not large, but it points to a possible weakness in how some students respond to changing technologies, new tasks, or adjustments in job roles.

Table 3. Descriptive Statistics

Variable	Mean	Std. Dev.
AI Literacy	3.74	0.62
Practical Skills	3.89	0.58
Adaptability	3.68	0.64
Employability	3.79	0.60

4.2. Correlation Analysis

Pearson coefficients were calculated for the four variables. All of the reported relationships were positive and statistically significant at $p < 0.01$. The largest correlation with employability was found for practical skills ($r = 0.682$). AI literacy ($r = 0.541$) and adaptability ($r = 0.489$) were also positively related to employability, although the associations were weaker. In this sample, students who rated their practical ability more highly also tended to report stronger employability. Digital competence and the ability to adjust to change showed similar, but more moderate, patterns.

Table 4. Correlation Analysis

Variable	AI Literacy	Practical Skills	Adaptability	Employability
AI Literacy	1			
Practical Skills	0.472**	1		
Adaptability	0.439**	0.511**	1	
Employability	0.594**	0.682**	0.548**	1

Note: $p < 0.01$

4.3. Regression Analysis

Employability was then entered as the dependent variable in a multiple linear regression model. AI literacy, practical skills, and adaptability were included together rather than tested in separate models. The adjusted R^2 was 0.574 ($F = 134.27$, $p < 0.001$), meaning that the three predictors accounted for 57.4% of the variation in employability. Practical skills had the largest standardized coefficient ($\beta = 0.427$, $p < 0.001$). The coefficient for AI literacy was 0.381 ($p < 0.001$), and that for adaptability was 0.294 ($p < 0.001$). VIF values ranged from 1.21 to 1.45, so the predictors did not show a serious multicollinearity problem. The three hypotheses were therefore supported by the regression results.

Table 5. Regression Analysis

Variable	Beta	t-value	p-value
Constant	0.842	4.227	0.000
AI Literacy	0.381	6.842	0.000
Practical Skills	0.427	8.133	0.000
Adaptability	0.294	5.004	0.002

Model statistics: R2 = 0.647, Adjusted R2= 0.639, F = 72.316, $p < 0.001$

5. Discussion

The regression results show that employability in this sample was related to more than one type of ability. Practical skills had the largest coefficient, but AI literacy and adaptability also remained significant when the three variables were considered together. This pattern is useful

because vocational education has traditionally placed much more weight on occupational practice than on the other two areas.

The strongest result concerned practical skills (β = 0.427). This fits the basic orientation of higher vocational education, where students spend considerable time learning how to carry out occupational tasks [6]. Employers still need graduates who can operate equipment, complete assigned work, and solve problems that arise on site. The spread of AI does not make these abilities unnecessary. In many jobs, new digital tools are added to existing practical tasks rather than replacing them completely. Maintaining sufficient practical training and workplace exposure is therefore still important.

AI literacy was also associated with employability (β = 0.381). The result does not mean that every vocational student needs advanced knowledge of algorithms or programming. A more immediate requirement is being able to understand and use the digital or AI-based tools that appear in a particular occupation. As these systems become more common, basic AI and data literacy may move closer to an ordinary workplace skill [7-8]. One practical option is to teach such content within professional courses instead of separating it entirely from occupational training.

Adaptability had the smallest of the three coefficients, but the relationship remained significant (β = 0.294). Vocational graduates may enter jobs for which procedures, software, or even job descriptions change within a short period. In that situation, previous training remains useful only if the graduate can transfer it to a new task. Project work, rotation across tasks, and simulated workplace problems may give students more experience in making this kind of adjustment.

There are also limits to what current vocational programs can provide [9]. Some students receive only scattered exposure to AI-related knowledge, and course content may be updated more slowly than workplace technology. Differences can also arise in teachers' digital experience and in access to practical training. These gaps matter because students can leave college with skills that do not fully match the tools used in their first job. More contact between colleges and employers could make curriculum updates more closely tied to actual occupational changes. Teacher training and practical modules also need to be revised when the technologies used in industry change.

6. Conclusion

This survey of 298 graduating students examined three factors related to employability: AI literacy, practical skills, and adaptability. Each factor was significant in the regression model. Practical skills had the largest coefficient (β = 0.427), followed by AI literacy (β = 0.381) and adaptability (β = 0.294), and the three variables together explained 57.4% of the variance in employability. The results do not support replacing traditional vocational training with AI-focused instruction. Instead, they point to a need to keep practical training while adding the digital knowledge that students are increasingly likely to encounter at work. Adaptability also deserves attention because graduates may have to work with tools or procedures that were not part of their original training. Curriculum design could therefore connect AI and data literacy with existing occupational courses and with real workplace practice. Closer cooperation with employers may also help colleges identify which skills are changing and adjust training accordingly.

Acknowledgments

Chongqing Municipal Education Commission 2025 Science and Technology Research Program Youth Project - Research on Strategies to Enhance the Employment Competence of Higher Vocational College Graduates in the Era of Artificial Intelligence (KJQN202505101)

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