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Vocational Education in Digital Transformation: An Empirical Exploration of Learning Environment Optimization and Employability Skills Enhancement

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Abstract

With the rapid development of the global economy and industrial upgrading, vocational education has increasingly played a critical role in enhancing students' employability and labor market competitiveness. However, the rapid advancement of digital technology has brought challenges to traditional vocational education models while also providing new opportunities. This study focuses on the digital learning environment in vocational education, employing the Technology Acceptance Model (TAM), Social Cognitive Theory (SCT), and the Competency Model to construct an empirical model that includes digital learning environments, learning self-efficacy, and employability skills. The aim is to explore the impact of digital learning environments on vocational education students' employability skills and the mediating role of learning self-efficacy.The results indicate that the ease of use, perceived usefulness, learning engagement, and interactivity of digital learning environments significantly enhance students' hard skills, soft skills, and adaptability. Furthermore, digital learning environments strengthen employability by boosting students' task control, perseverance, and sense of achievement. This study provides practical recommendations for vocational education curriculum design and digital platform development, emphasizing the importance of digital learning environments in improving students' employability.

Keywords: *Vocational education;digital learning environment;employability skills;learning self-efficacy;Technology Acceptance Mode*

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1. Introduction

1.1. Research Background

With the rapid development of the global economy and industrial upgrading, vocational education has increasingly played a critical role in promoting student employment and enhancing labor market competitiveness (Fawaz-Yissi & Vallejos-Cartes, 2020). However, the rapid advancement of digital technology has posed numerous challenges to traditional vocational education models in terms of skill development and alignment with the demands of modern society (Kovalchuk et al.,2023). The introduction of digital learning environments has created new opportunities for vocational education. Through technologies such as artificial intelligence, virtual reality, and adaptive learning platforms, vocational education is progressively bridging the gap between classroom learning and skill application, providing significant support for students' skill acquisition and career readiness (Yang et al., 2023).

In particular, in China, vocational education, as a vital component of higher education, bears the responsibility of cultivating highly skilled talent (Zhou & Xiao,2023). Nevertheless, despite the growing integration of digital learning environments in vocational education, there remains a lack of research on how effectively these environments enhance students' employability skills (Chen,2023). Current research largely focuses on technological aspects, and there is a noticeable gap in empirical analyses examining how digital learning environments impact the employability skills of vocational education students, as well as the mediating role of self-efficacy in learning (Zhou,2023).

1.2. Research Questions

Based on the above context, this study aims to investigate the mechanisms by which digital learning environments influence the employability skills of vocational education students, with a particular focus on the mediating role of learning self-efficacy. The core research questions of this study are as follows:

- To what extent can digital learning environments enhance the employability skills of vocational education students?
- What mediating role does learning self-efficacy play between digital learning environments and employability skills?
- Are there significant differences in the impact of various dimensions of digital learning environments (e.g., ease of use, engagement) on students' employability skills?

By addressing these questions, this study seeks to reveal the potential and mechanisms through which digital learning environments enhance employability skills among vocational education students, thereby providing empirical evidence to inform vocational education practices.

1.3. Research Objectives and Contributions

The primary aim of this study is to construct and validate an empirical model incorporating digital learning environments, learning self-efficacy, and employability skills. This model enables a systematic analysis of the formation pathways of learning self-efficacy within digital learning environments and its impact on employability skills among vocational education students. Specifically, the contributions of this paper include:

Theoretical Contribution: This study integrates the Technology Acceptance Model (TAM) and Social Cognitive Theory (SCT), expanding the application of digital learning environments and learning self-efficacy in the context of vocational education. This integration offers new insights for theoretical development in the field of educational technology.

Practical Contribution: The findings of this study will provide practical guidance for the design of vocational education curricula, development of digital platforms, and instructional strategies aimed at enhancing students' professional skills. These insights will serve as valuable references for vocational education institutions and educational technology developers seeking to optimize learning environments and improve student learning outcomes.

1.4. Organization of the Paper

The second section of this paper is a literature review, which systematically examines relevant research and theoretical foundations regarding digital learning environments, learning self-efficacy, and employability skills. The third section focuses on the research methodology, introducing the study design, variable measurement, sample and data sources, and data analysis methods. The fourth section presents the results analysis, showcasing the outcomes of hypothesis testing and path analysis. The fifth section is the discussion, analyzing the theoretical contributions and practical implications of the findings, as well as exploring the limitations of the study and directions for future research. The final section is the conclusion, summarizing the main findings of this study and their application value in vocational education.

2. Literature Review

2.1. Digital Learning Environment in Vocational Education

With the rapid advancement of information technology, the application of digital learning environments in vocational education has become increasingly widespread (Kovalchuk et al.,2023). Digital learning environments utilize virtual platforms and intelligent tools to provide students with diverse learning resources and interactive opportunities, thus facilitating skill development (Dobricki et al.,2020). The Technology Acceptance Model (TAM) offers an effective framework to explain learners' acceptance of and willingness to use digital platforms. The TAM model is built on two core dimensions: Ease of Use and Perceived Usefulness. These factors have been shown to significantly impact students' engagement and interactivity on learning platforms (Seufert & Scheffler, 2016).

The unique characteristics of vocational education require digital learning environments to be not only user-friendly but also rich in content and highly interactive to meet students' needs for practical skill acquisition (Gladun et al., 2018). Research indicates that digital learning environments characterized by high interactivity and engagement can markedly enhance students' learning experiences and motivation, thereby strengthening their mastery of knowledge and skills (McGuinness & Fulton, 2019). Therefore, based on the theoretical foundation of the TAM model, this study will explore the impact of four key dimensions of digital learning environments—Ease of Use, Usefulness, Learning Engagement, and Interactivity—on employability skills among vocational education students.

2.2. Self-Efficacy in Learning and Its Impact on Learning Outcomes

Self-Efficacy in Learning refers to an individual's belief in their ability to complete learning tasks, which impacts both learning motivation and performance (Schunk & DiBenedetto, 2015). It is one of the core concepts of Social Cognitive Theory (SCT) as

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proposed by Bandura (1977) (Schunk & Usher, 2012). According to SCT, self-efficacy affects an individual's persistence and problem-solving strategies when faced with challenging tasks, making it a key predictor of learning outcomes (Dinther et al., 2011).

In vocational education, self-efficacy in learning influences students' proficiency in both technical and soft skills. Particularly in demanding, hands-on courses, high levels of self-efficacy can significantly enhance students' learning outcomes (Gosselin, 2021). Studies have shown that self-efficacy positively affects students' learning behaviors, sense of achievement, and confidence, and it can also serve as an important mediating variable in students' engagement with and adaptation to digital learning environments (Zimmerman, 2000). Consequently, this study will employ three key dimensions of self-efficacy in learning—perceived task control, persistence, and sense of achievement—to examine its mediating role between digital learning environments and employability skills.

2.3. Employment Skills and Competency Model

Employment Skills refer to the technical and general competencies that students need in a professional environment, which directly determine their employability and career development potential (Mainga et al., 2022). The Competency Model emphasizes that students must possess not only hard skills, such as technical proficiency and specialized knowledge, but also soft skills, including communication, teamwork, and adaptability (Wikle & Fagin, 2015). These skills are essential for navigating complex work environments and meeting the evolving demands of the workforce (Taylor, 2016).

Existing research indicates that digital learning environments can indirectly enhance students' employment skills by increasing their self-efficacy, especially in the cultivation of soft skills and adaptability (Jelonek et al., 2020). While the acquisition of hard skills often requires hands-on training and practice, soft skills and adaptability are more strongly influenced by students' self-efficacy and learning motivation (Schiro Withanachchi et al., 2022). Thus, the Competency Model provides the theoretical basis for defining employment skills in this study and establishes a foundation for understanding how digital learning environments and self-efficacy contribute to students' competitiveness in the job market.

2.4. Theoretical Framework and Hypotheses Development

Based on the above literature review, this study integrates the Technology Acceptance Model (TAM), Social Cognitive Theory (SCT), and the Competency Model to construct a theoretical framework encompassing digital learning environments, self-efficacy in learning, and employment skills(Figure 1).

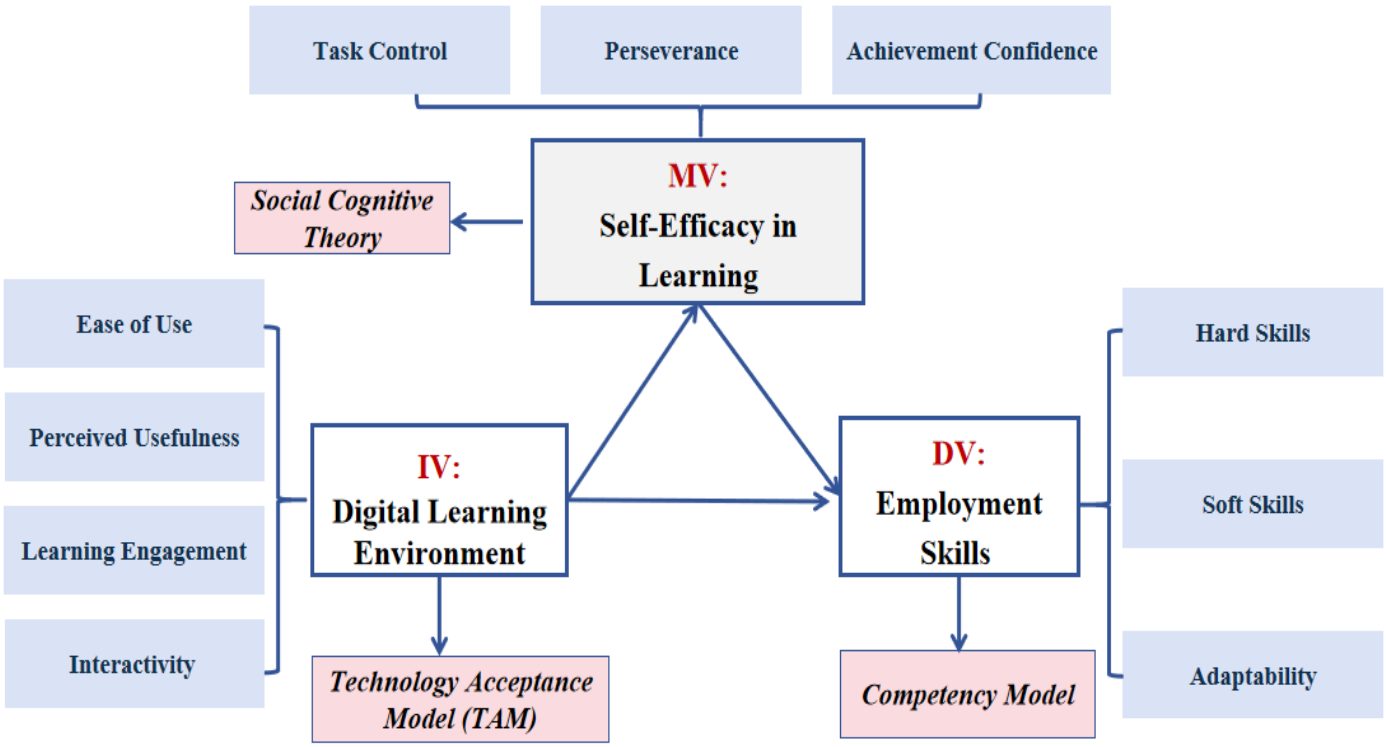

Figure 1 : Conceptual Framework

The specific hypotheses of this study are as follows:

- H1: Digital learning environments have a positive impact on employability skills, particularly through enhancements in ease of use, perceived usefulness, engagement, and interactivity.
- H2: Self-efficacy in learning serves as a mediating factor between digital learning environments and employability skills, meaning that digital learning environments indirectly improve employability skills by enhancing students' self-efficacy.
- H3: Different dimensions of digital learning environments (e.g., ease of use, perceived usefulness, engagement, interactivity) have significantly different effects on students' employability skills.

This theoretical framework and set of hypotheses provide the logical foundation and verification pathway for the empirical research in this paper. By testing these hypotheses, this study aims to uncover the relational mechanisms among digital learning environments, self-efficacy in learning, and employability skills, thereby offering theoretical support and practical insights for digital learning practices in vocational education.

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3. Methodology

3.1. Research Design

This study adopts a quantitative research approach, collecting data through a survey to test the empirical model on the impact of digital learning environments on employability skills and to explore the mediating role of self-efficacy in learning. Based on the Technology Acceptance Model (TAM), Social Cognitive Theory (SCT), and the Competency Model, this study constructs a Structural Equation Model (SEM) to conduct path analysis and hypothesis testing on the relationships between variables. Data will be collected from students in vocational education institutions, and statistical analysis tools will be used to process and analyze the data, ensuring the scientific rigor and reliability of the research findings.

3.2. Sample and Data Collection

3.2.1. Sample Selection

The sample for this study consists of 441 students from five vocational colleges in China. This group was chosen because they are direct users of digital learning environments and have a pressing need to enhance their employability skills. This diverse sample includes students from various regions and academic disciplines, which helps ensure the representativeness and generalizability of the research findings.

3.2.2. Data Collection Process

Data was collected through a structured questionnaire, divided into four sections: basic information, digital learning environment, self-efficacy in learning, and employability skills. The questionnaire design was based on well-established scales from the literature and was reviewed by experts and pilot-tested on a small scale to ensure suitability for the learning context of vocational education students. The questionnaire was distributed via an online platform to allow students to complete it conveniently, thereby ensuring efficient data collection.

3.2.3. Reliability of Data Sources

To ensure the validity and representativeness of the data, this study implemented strict controls in sample selection, ensuring diversity in data sources. During the data collection process, responses were monitored, and incomplete or inconsistent answers were excluded to improve data quality and reliability.

3.3. Measurement of Variables

3.3.1. Digital Learning Environment

Based on the Technology Acceptance Model (TAM), the measurement of the digital learning environment includes the following four dimensions:

- Ease of Use: This refers to students' perceptions of the convenience and ease of operating the learning platform, assessing whether students find the platform easy to use and access.
- Perceived Usefulness: This measures students' perceptions of the digital learning platform's effectiveness in improving learning efficiency and outcomes.
- Learning Engagement: This includes the frequency of students' participation in learning activities, their completion of assignments, and their frequency of using learning resources.
- Interactivity: This assesses students' level of interaction on the learning platform, including the frequency and quality of their interactions with teachers, peers, and learning content.

Each dimension is measured through multiple Likert scale items (1 = strongly disagree, 5 = strongly agree) to evaluate students' perceptions of the digital learning environment.

3.3.2. Self-Efficacy in Learning

Based on Social Cognitive Theory (SCT), the measurement of self-efficacy in learning includes the following three dimensions:

- Task Control: This assesses students' confidence and sense of control in completing learning tasks.
- Perseverance: This measures students' persistence when facing learning challenges, indicating whether they continue to make an effort despite difficulties.
- Achievement Confidence: This evaluates students' confidence in their own learning achievements and abilities.

These dimensions are assessed using a Likert scale (1 = strongly disagree, 5 = strongly agree) to accurately reflect students' levels of self-efficacy.

3.3.3. Employment Skills

Based on the Competency Model, the measurement of employment skills includes the following three dimensions:

- Hard Skills: These refer to the technical skills and professional abilities that students need in a vocational environment, such as technical operations, programming, etc.
- Soft Skills: Skills such as communication, teamwork, time management, and problem-solving, which are essential in modern workplaces.
- Adaptability: This is students' ability to adjust to new work environments and changing tasks, including the flexibility to handle new tasks and the capacity for learning.

Each dimension is measured using a Likert scale to quantify students' varied performance levels in employment skills.

3.4. Analytical Methods

This study employs descriptive analysis, reliability and validity testing, Structural Equation Modeling (SEM), and path analysis.

3.4.1. Descriptive Analysis

Descriptive statistics are first conducted on sample characteristics and primary variables to understand the distribution of each variable and the basic characteristics of the sample. Descriptive analysis provides fundamental statistical information, such as mean and standard deviation for the variables, which lays the groundwork for further analysis.

3.4.2. Reliability and Validity Testing

Reliability analysis is conducted using Cronbach's Alpha coefficient to test the internal consistency of each scale, ensuring its stability. Validity is assessed through the KMO test and Bartlett's sphericity test to determine whether the data is suitable for factor analysis.

3.4.3. Structural Equation Modeling (SEM)

SEM is used to perform path analysis, verifying the causal relationships and pathway effects between variables for each hypothesis. The advantage of SEM lies in its ability to simultaneously handle multiple variable relationships, making it an effective tool for analyzing complex models.

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3.4.4. Path Analysis

SEM-based path analysis is applied to assess both direct and indirect effects across dimensions, with a focus on the mediating role of self-efficacy in learning between digital learning environments and employment skills, thereby quantifying the impact relationships among variables.

By employing these analytical methods, this study aims to uncover the complex relationships among digital learning environments, self-efficacy in learning, and employment skills, ensuring the reliability and interpretability of the data analysis results. This will provide empirical evidence for optimizing digital learning environments within vocational education.

4. Results

A total of 441 students participated in this study (Table 1). Among them, 176 were male (40%) and 265 were female (60%). Most participants were between 18 and 21 years old, accounting for 395 students (89.6%), with 42 students (9.5%) under 18 and 4 students (0.9%) aged between 21 and 23. The sample included 108 first-year students (24.5%), 237 second-year students (53.7%), and 96 third-year students (21.8%).

In terms of field of study, the highest representation was from bioengineering, with 129 students (29.3%), followed by optoelectronics with 81 students (18.4%) and intelligent manufacturing with 54 students (12.2%). Other fields represented included computer science, journalism and communication, business, architecture, tourism, languages, and the arts.

Table 1:Detailed Sample Demographic Characteristics

Characteristic	Category	Frequency	Percentage
Gender	Male	176	39.90%
	Female	265	60.10%
Age	18-21 years	395	89.60%
	Under 18	42	9.50%
	21-23 years	4	0.90%
Grade	Grade 2	237	53.70%
	Grade 1	108	24.50%
	Grade 3	96	21.80%
Major	Bioengineering	129	29.30%
	Optoelectronics	81	18.40%
	Intelligent Manufacturing	54	12.20%
	Computer Science	45	10.20%
	Journalism and Communication	37	8.40%
	Business	29	6.60%
	Architecture	27	6.10%
	Tourism	20	4.50%
	Languages	11	2.50%
	Arts	8	1.80%

4.1. Descriptive Statistics

Descriptive statistics for the main dimensions of the digital learning environment, self-efficacy in learning, and employability skills are presented in Table 2. Overall, the high mean scores across dimensions indicate that students hold a positive attitude towards the digital learning environment and its components.

- Digital Learning Environment: The mean scores for Ease of Use, Perceived Usefulness, Learning Engagement, and Interactivity were 3.66 (SD = 0.84), 3.87 (SD = 0.78), 3.90 (SD = 0.77), and 3.89 (SD = 0.76), respectively. These results suggest that students find the digital learning environment easy to use, beneficial for improving learning outcomes, and effective in enhancing engagement and interactive experiences.
- Self-Efficacy in Learning: The mean scores for Task Control, Perseverance, and Achievement Confidence were 3.98 (SD = 0.72), 3.95 (SD = 0.79), and 3.84 (SD = 0.79), respectively. This indicates that students generally exhibit a high level of self-efficacy in learning, showing confidence in managing learning tasks, persistence in facing challenges, and a sense of achievement in their studies.
- Employment Skills: The mean scores for Hard Skills, Soft Skills, and Adaptability were 3.85 (SD = 0.75), 3.93 (SD = 0.75), and 3.95 (SD = 0.71), respectively. These findings reflect students' belief that the digital learning environment positively contributes to their employability skills, especially in areas such as technical skills, communication and teamwork, and adaptability to new environments.

The correlation analysis in this study revealed relationships among the independent variable (digital learning environment), mediating variable (self-efficacy in learning), and dependent variable (employment skills).

- Digital Learning Environment and Self-Efficacy in Learning: There is a moderate positive correlation between the digital learning environment and self-efficacy in learning (r = 0.63), indicating that when students find the digital learning platform easy to use, interactive, and well-resourced, their self-efficacy in learning is also enhanced. This suggests that the design and functionality of digital learning environments can effectively boost students' confidence and persistence in learning tasks.
- Self-Efficacy in Learning and Employment Skills: The correlation between self-efficacy in learning and employment skills is strong, with a coefficient of 0.89. This suggests that as students' self-efficacy in learning increases (i.e., they feel confident, persistent, and experience a sense of achievement in their studies), there is a significant improvement in their employability skills, particularly in hard skills, soft skills, and adaptability.
- Digital Learning Environment and Employment Skills: There is also a positive correlation between the digital learning environment and employment skills (r = 0.57), indicating that the digital learning environment can indirectly promote the development of employability skills by positively impacting students' learning experience and self-efficacy. Although this direct effect is slightly weaker than the effect mediated by self-

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efficacy, it still underscores the value of the digital learning environment in enhancing students' employability.

Overall, these results indicate that the digital learning environment not only has a direct impact on employment skills but also plays a crucial mediating role through enhancing self-efficacy in learning.

Table 2 : Descriptive Statistics for Specified Major Dimensions

Dimension		M	SD	IV	MV	DV
Digital Learning Environment	Ease of Use	3.66	0.84	1.00		
	Perceived Usefulness	3.87	0.78			
	Learning Engagement	3.90	0.77			
	Interactivity	3.89	0.76			
Self-Efficacy in Learning	Task Control	3.98	0.72	0.63	1.00	
	Persistence	3.95	0.79			
	Learning Achievement	3.84	0.79			
Employment Skills	Hard Skills	3.85	0.75	0.57	0.89	1.00
	Soft Skills	3.93	0.75			
	Adaptability	3.95	0.71			

The above results indicate that the digital learning environment—particularly its ease of use, perceived usefulness, and interactivity—not only enhances students' self-efficacy in learning but also positively influences the development of their employability skills. Notably, learning engagement plays a key mediating role, showing strong correlations with both components of the digital learning environment and employability skills. These findings underscore the importance of strengthening interactive and engagement-related functions within digital learning platforms to better support students' skill development and employability enhancement.

4.2. Reliability and Validity Analysis

This study conducted Cronbach's Alpha analysis to test the reliability of the scales and verify the internal consistency of each dimension. As shown in Table 3, the Cronbach's Alpha coefficients for all dimensions were above 0.85, indicating good internal consistency of the scales. For instance, the Alpha values for the dimensions of "Learning Engagement" and "Interactivity" were 0.96 and 0.97, respectively, suggesting high consistency among the items measuring the same construct. Therefore, the reliability analysis supports the reliability of the scales.

Validity analysis was conducted using the KMO test and Bartlett's test of sphericity to assess the suitability of the data for factor analysis. The KMO values ranged from 0.70 to 0.78, indicating that the data are appropriate for factor analysis. Bartlett's test of sphericity showed significant Chi-Square values for all dimensions ($p < 0.001$), further supporting the suitability of the data structure for factor analysis. These validity test results indicate that the scales have good structural validity and effectively measure each construct under study.

Table 3 : Reliability and validity analysis

Dimension	Cronbach's Alpha	KMO	Bartlett's Test (Chi-Square)	P
Ease of Use	0.85	0.7	375.45	< 0.001
Perceived Usefulness	0.87	0.73	410.22	
Learning Engagement	0.96	0.78	530.6	
Interactivity	0.97	0.76	520.3	
Self-Efficacy in Learning	0.88	0.74	415.1	
Employment Skills	0.9	0.75	440.85	

In summary, the results of the reliability and validity analyses indicate that the scales exhibit strong internal consistency and structural validity in measuring the dimensions of digital learning environments, self-efficacy in learning, and employability skills.

4.3. Hypotheses Testing and Path Analysis

Path analysis was conducted using Structural Equation Modeling (SEM) to examine the relationships between Digital Learning Environment (DLE), Self-Efficacy in Learning (SEL), and Employment Skills (ES). The results are presented in Table 4.

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Table 4 : Hypotheses Testing and Path Analysis Results

Path	Coefficient	P-Value
DLE→SEL	0.76	< 0.001
SEL→ ES	0.91	
DLE→ ES (Direct)	0.83	
DLE → ES (Indirect)	0.69	

- Path DLE→SEL: The path coefficient from the digital learning environment to self-efficacy in learning was 0.76 ($p < 0.001$), indicating that improvements in the digital learning environment significantly enhance students' self-efficacy in learning.
- Path SEL→ES: The path coefficient from self-efficacy in learning to employment skills was 0.91 ($p < 0.001$), demonstrating that increases in self-efficacy in learning are strongly associated with enhanced employability skills.
- Direct Path DLE→ES: The direct path coefficient from the digital learning environment to employment skills was 0.83 ($p < 0.001$), suggesting that the digital learning environment has a significant positive impact on employment skills, even without the mediation of self-efficacy.
- Indirect Path DLE→SEL→ES: The indirect path coefficient from the digital learning environment to employment skills, mediated by self-efficacy in learning, was calculated at 0.69 (derived from the product of the DLE→SEL and SEL→ES path coefficients). This finding indicates that the digital learning environment indirectly enhances employability skills through self-efficacy in learning, further supporting the role of self-efficacy as a mediating variable.

In summary, the path analysis results show that the digital learning environment not only has a direct impact on employment skills but also indirectly boosts employability through the mediating effect of self-efficacy in learning. This analysis supports the study's hypothesis that the digital learning environment promotes the development of employability skills by enhancing students' self-efficacy in learning.

5. Discussion

This study demonstrates that digital learning environments have significant direct and indirect effects on the employability skills of vocational education students. Specifically, the four dimensions of digital learning environments—ease of use, perceived usefulness, learning engagement, and interactivity—not only directly enhance students' employability skills but also amplify this effect through improved self-efficacy in learning. Self-efficacy in learning serves as a crucial mediating factor between digital learning environments and employability skills, confirming that digital learning environments can indirectly improve students' hard skills, soft skills, and adaptability by boosting their confidence and task perseverance.

First, the direct and indirect impacts of digital learning environments on employability skills offer valuable theoretical contributions. This study supports the Technology Acceptance Model (TAM) and Social Cognitive Theory (SCT), highlighting the differential impacts of various dimensions of digital learning environments, such as ease of use, usefulness, learning engagement, and interactivity, on employability skills. The mediating role of self-efficacy in learning introduces new theoretical insights, addressing gaps in the literature regarding mediation. Additionally, this study provides practical guidance for the design of digital learning environments and the enhancement of student skills in vocational education.

The findings of this study have practical implications for curriculum design and digital platform development in vocational education. Vocational institutions should prioritize features that enhance interactivity and engagement in digital learning platforms to boost students' self-efficacy. Additionally, educational technology developers could utilize AI and data analytics tools to create platforms with personalized feedback and support systems, helping students build task control and a sense of achievement, which in turn enhance employability skills. Teachers can also encourage students to engage actively with digital platforms to build confidence in learning and better prepare them for entering the workforce.

Future research could expand the sample to vocational institutions in more countries and regions to verify the generalizability of these findings. Additionally, longitudinal research could be employed to track changes in self-efficacy and employability skills across different stages of learning. With advancements in artificial intelligence, future studies might also explore the potential of intelligent learning platforms to develop personalized employability skills, particularly in fostering students' innovation and cross-cultural communication abilities.

In conclusion, this study provides an in-depth analysis of the relationships among digital learning environments, self-efficacy in learning, and employability skills of vocational education students. Through empirical analysis using Structural Equation Modeling, the study offers valuable insights and practical recommendations for optimizing curriculum design and digital learning platforms in vocational education.

6. Conclusion

This study constructed and validated an empirical model that includes digital learning environments, self-efficacy in learning, and employability skills, revealing how digital learning environments enhance vocational education students' employability skills by boosting their self-efficacy. The results show that the ease of use, perceived usefulness, engagement, and interactivity of digital learning environments significantly improve students' hard skills, soft skills, and adaptability. Furthermore, these environments strengthen employability by enhancing students' task control, perseverance, and sense of achievement. Self-efficacy in learning plays a critical mediating role, providing a theoretical foundation and empirical support for vocational education curriculum design.

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Based on these findings, the study offers the following recommendations for optimizing digital learning practices in vocational education:

- Optimize Digital Platform Design: Vocational education institutions should enhance the usability and interactivity of digital learning platforms to provide students with a more engaging learning experience. This includes improving the practical relevance and applicability of learning content to meet students' needs for career-related skills.
- Strengthen Students' Self-Efficacy: In the teaching process, focus should be placed on increasing students' task control and perseverance through task setting and feedback mechanisms, helping students maintain a positive learning attitude in the face of challenges. Motivational strategies and goal-setting can be used to build students' confidence and sense of achievement in skill acquisition.
- Enhance Training in Soft Skills and Adaptability: Curriculum design should incorporate more contextualized tasks that involve teamwork, problem-solving, and communication, fostering students' collaboration skills and adaptability. These elements can help students remain competitive in a rapidly changing job market.

The findings also have significant implications for vocational education policy development. As digital transformation deepens, policymakers should support vocational education institutions in integrating advanced digital tools and platforms into their teaching practices. Relevant standards should be established to ensure the quality and applicability of digital educational resources. Additionally, policies could encourage the integration of AI and data analytics in teaching to achieve personalized skill development and learning support, thereby offering students more diverse learning pathways and promoting comprehensive employability development.

In conclusion, this study provides both theoretical and empirical support for digital learning practices in vocational education and offers guidance for policymakers, educational institutions, and digital platform developers in enhancing students' employability. With continued technological advancements and innovative teaching models, the role of digital learning environments in vocational education will likely become even more prominent, creating new opportunities for students' career development.

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