



RESEARCH ARTICLE

ENHANCING GRADUATE EMPLOYABILITY THROUGH DIGITAL AND INTELLIGENT VOCATIONAL SKILLS TRAINING: AN EMPIRICAL STUDY OF UNIVERSITY STUDENTS IN CHINA

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ARTICLE INFO	ABSTRACT
Submission Jan. 29, 2026 Acceptance Mar. 28, 2026 Keywords Digital and intelligent education; Employ-ability; Artificial intelligence; University students; China Corresponding Author 470406906@qq.com	Improving graduate employability has become a central concern for higher education under conditions of digital transformation. This study examines the relationship between digitalised vocational skills training and university students' employability, with a focus on the role of practical competence. The study adopts a theory-driven quantitative research design based on questionnaire survey data collected from students enrolled in vocationally oriented programmes at four higher education institutions in Dongying City, China. A total of 1,528 valid responses were obtained through telephone surveys, online questionnaires, and on-site distribution. Digitalised vocational skills training, practical competence, and graduate employability were measured using multi-item indicators reflecting training exposure, applied skill development, and early employment-related outcomes. The results indicate that students' participation in vocational skills training is strongly employment-oriented, while overall cognitive awareness of training systems remains limited. Misalignment between training content and enterprise practice, insufficient practical opportunities, and outdated instructional methods constrain training effectiveness. In addition, underdeveloped information-based training platforms restrict learning support and resource integration. Overall, digitalised vocational skills training is positively associated with employability outcomes, primarily through the enhancement of practical competence.

1. INTRODUCTION

Rapid advances in digital technologies are reshaping contemporary labour markets by altering not only occupational structures but also the nature of skills required for sustainable employment. Employers increasingly emphasise graduates' ability to apply knowledge in digitally mediated, practice-oriented, and adaptive work environments. This shift has intensified long-standing concerns regarding graduate employability, particularly in relation to whether higher education institutions can effectively respond to technologically driven changes in skill demand.

Vocational and skills-oriented training has traditionally been regarded as a key institutional mechanism for improving employment outcomes by narrowing the gap between education and work. In recent years, Busemeyer, M. R., & Trampusch(2019) found universities have increasingly incorporated digital platforms, intelligent training systems, and blended learning models into vocational skills provision. However, it remains unclear whether such digitalisation fundamentally enhances employability or primarily modifies instructional delivery. Empirical findings are mixed, especially where digital training initiatives expand rapidly without being fully embedded within curricular structures or aligned with labour market requirements.

The employability literature offers valuable theoretical perspectives on how education contributes to labour market outcomes. Human capital theory frames education and training as investments that enhance individual productivity and economic returns, while more recent work emphasises employability skills, competency-based education, and work-integrated learning. Despite these advances, existing studies often conceptualise employability in broad terms, offering limited insight into how digitally mediated training environments influence the formation of labour-market-relevant capabilities.

Similarly, research on digital learning in higher education has primarily focused on pedagogical effectiveness, learner engagement, and instructional design. Cedefop(2020) found comparatively less attention has been paid to employment-related outcomes, particularly the mechanisms through which digitalised vocational training translates into competencies valued by employers (Clarke, 2018). As a result, the linkage between digital training inputs and employment quality remains theoretically underdeveloped and empirically underexplored.

This study addresses these gaps by examining the employability effects of digitalised vocational skills training among university students in China. The Chinese context provides a salient empirical setting, given the rapid pace of industrial digitalisation and the scale of higher education expansion. Universities are under increasing pressure to demonstrate that digitally enhanced training contributes meaningfully to graduates' employment prospects. By focusing on vocationally oriented digital skills training within university programmes, this study seeks to clarify whether and how such training improves employability outcomes.

1.1. Theoretical Contribution and Research Positioning

The study contributes to the literature by refining employability-oriented human capital arguments within a digital training context. Rather than treating human capital theory as a general explanatory framework, this research specifies the conditions under which digitalised vocational training enhances the effectiveness and relevance of skill formation. Employability is conceptualised as a dynamic capability development process shaped by training design,

technological mediation, and institutional alignment with labour market demand.

Drawing on human capital theory alongside insights from situated learning and career development perspectives, the study advances existing research in two ways. First, it highlights how digital and intelligent training systems can strengthen the practical applicability and transferability of vocational skills. Second, it situates employability formation within broader processes of technological and industrial transformation, offering a context-sensitive account of how educational investments generate labour market value.

1.2. Research Focus and Paper Structure

Empirically, the study adopts a focused, theory-driven analytical framework that examines the relationship between digitalised vocational skills training and graduate employability, with practical competence serving as the core mediating mechanism. Practical competence is prioritised due to its theoretical relevance, empirical observability, and institutional measurability within vocationally oriented higher education. Other employability-related factors are treated as complementary dimensions embedded within the broader skill formation process.

The remainder of the paper is organised as follows. Section 2 reviews the relevant literature and develops the research hypotheses. Section 3 describes the data sources and methodological approach. Section 4 presents the empirical findings. Section 5 discusses the results and their implications, and Section 6 concludes with recommendations for policy and future research.

2. LITERATURE REVIEW

2.1. Digitalised Vocational Skills Training and Employability

Graduate employability has become a central concern in higher education research, particularly in contexts characterised by rapid technological change and labour market uncertainty. Employability is increasingly understood as a multidimensional construct encompassing not only employment outcomes but also graduates' capacity to obtain, sustain, and progress in employment. Within this framework, vocationally oriented skills training is frequently identified as a critical institutional mechanism for enhancing employability by strengthening the alignment between education and work.

The digitalisation of vocational skills training has introduced new opportunities and challenges for employability development. Digital platforms, intelligent training systems, and blended learning environments are often promoted as tools that can enhance flexibility, scalability, and accessibility of skills training (Jackson, 2021). Empirical studies suggest that digitalised training can support personalised learning paths, facilitate simulation-based practice, and improve exposure to authentic work scenarios. However, evidence regarding its employability impact remains inconclusive. Some studies report positive associations between digital skills training and labour market outcomes, while others find limited or uneven effects, particularly when digital tools are weakly integrated into curricular and institutional structures.

One explanation for these mixed findings lies in the tendency of existing research to focus on the presence of digital training initiatives rather than on their substantive role in skill formation. Digitalisation alone does not guarantee improved employability outcomes; instead, its effectiveness depends on whether digital tools are embedded in vocational training designs that

prioritise applied learning, task authenticity, and industry relevance. Consequently, there is a need for more theory-driven empirical research that examines how digitalised vocational skills training contributes to employability through specific capability formation processes.

Building on this perspective, the present study conceptualises digitalised vocational skills training as an institutional input that influences employability indirectly by shaping graduates' practical competence. Rather than assuming a direct and uniform effect on employment outcomes, this approach recognises the mediating role of skill development quality in translating training inputs into labour market value.

Hypothesis 1: Digitalised vocational skills training is positively associated with graduate employability.

2.2. Practical Competence as a Mediating Mechanism

Practical competence occupies a central position in both vocational education theory and employability research. It refers to the ability to apply knowledge, skills, and judgement effectively in real or simulated work contexts. Unlike abstract academic achievement, practical competence emphasises task performance, problem-solving, and adaptability, which are increasingly valued in digitally transformed workplaces.

From a human capital perspective, practical competence represents a form of productive capability that enhances graduates' labour market value. Training environments that provide opportunities for hands-on practice, contextual learning, and iterative feedback are more likely to generate competencies that are transferable to employment settings. Digitalised vocational skills training has the potential to strengthen practical competence by enabling simulation-based learning, virtual experimentation, and data-driven feedback mechanisms. When designed effectively, such environments can approximate workplace conditions and support the development of job-relevant skills (World Economic Forum, 2023).

Empirical evidence supports the link between practical competence and employability outcomes. Studies consistently show that graduates with stronger practical and applied skills experience smoother school-to-work transitions, higher job match quality, and better early career outcomes. Employers frequently report that practical competence is a decisive factor in recruitment and early career performance, particularly in technically oriented and rapidly evolving industries.

Despite this recognition, many studies treat practical competence as one of multiple parallel employability dimensions rather than as a central explanatory mechanism. This multiplicity of pathways can obscure analytical clarity and complicate empirical testing. In contrast, the present study adopts a focused mediation framework in which practical competence serves as the primary channel linking digitalised vocational skills training to employability outcomes. Other employability-related attributes are conceptually embedded within this competence-based mechanism or excluded due to scope considerations.

Hypothesis 2: Digitalised vocational skills training is positively associated with graduates' practical competence.

Hypothesis 3: Practical competence is positively associated with graduate employability.

2.3. Mediation Hypothesis

Integrating the above arguments, this study proposes that the effect of digitalised vocational skills training on employability operates primarily through the enhancement of practical competence. Digital training environments that prioritise applied learning and task authenticity are expected to improve graduates' ability to perform work-related tasks, which in turn enhances their employability in the labour market.

By specifying this mediation mechanism, the study advances existing employability research in two ways. First, it moves beyond direct-effect models that implicitly assume uniform training impacts. Second, it provides a theoretically grounded explanation of how digitalised vocational training translates into labour market outcomes through capability formation.

Hypothesis 4: Practical competence mediates the relationship between digitalised vocational skills training and graduate employability.

3. METHODOLOGY

3.1. Research Design and Analytical Framework

This study adopts a quantitative, theory-driven research design to examine the relationship between digitalised vocational skills training and graduate employability, with practical competence specified as the mediating mechanism. The analytical framework is derived directly from the hypotheses developed in Section 2 and follows a confirmatory rather than exploratory logic.

Consistent with the description provided in the Abstract, the study focuses on testing a theoretically specified mediation pathway. Digitalised vocational skills training is treated as the exogenous variable, graduate employability as the outcome variable, and practical competence as the sole mediating variable. This parsimonious structure is intentionally adopted to enhance interpretability and analytical clarity, which is particularly important in applied vocational education research.

The hypothesised mediation model is estimated using a simplified Structural Equation Modeling (SEM) framework to assess direct and indirect effects simultaneously. SEM is employed to validate the theoretical mediation pathway rather than to explore complex latent structures. To enhance robustness, regression-based mediation analysis is additionally conducted as a complementary check.

3.2. Data Sources and Unit of Analysis

The empirical data are derived from a structured questionnaire survey conducted among university students enrolled in vocationally oriented programmes in Dongying City, Shandong Province, China. The survey covered four higher education institutions: Shandong University of Petrochemical Technology, Dongying Vocational College, Dongying Science and Technology Vocational College, and Shandong Shengli Vocational College. These institutions represent a mix of applied undergraduate and higher vocational colleges, reflecting the regional structure of vocationally oriented higher education.

A random sampling strategy was adopted within each institution to ensure

representativeness of the student population. Data were collected using three complementary approaches: (1) telephone surveys, in which respondents completed the questionnaire through structured question-answer interactions; (2) online surveys distributed via the “Questionnaire Star” (Wenjuanxing) WeChat mini-program; and (3) on-site paper-based surveys administered by trained research team members during campus visits.

A total of 1,528 questionnaires were distributed, of which 1,528 valid responses were retained for analysis, yielding an effective response rate of 98.5%. The unit of analysis is the individual student. All survey data were coded and processed using SPSS for statistical analysis.

3.3. Questionnaire Development and Data Quality Control

The questionnaire was developed through a multi-stage process to ensure content validity and practical relevance. First, an extensive review of existing literature on vocational education, digital skills training, and graduate employability was conducted to establish the theoretical foundation and inform item construction. Second, semi-structured interviews were carried out with experts in vocational education, government officials, and industry practitioners to refine the questionnaire framework and ensure alignment with real-world skills requirements. Based on these inputs, a preliminary questionnaire draft was developed.

Third, the questionnaire was revised and finalized following expert feedback, with adjustments made to item wording, structure, and sequencing to improve clarity and respondent engagement. These procedures enhanced the scientific rigor, feasibility, and contextual appropriateness of the measurement instrument.

3.4. Measurement of Key Variables

3.4.1. Digitalised Vocational Skills Training

Digitalised vocational skills training is operationalised as the extent to which vocational training modules are delivered through digitally supported and intelligence-oriented learning environments. Measurement items capture students’ exposure to digital training platforms, simulation-based instructional tools, and technology-supported practical learning activities. These indicators reflect the substantive integration of digital tools into vocational skills training rather than their mere availability.

3.4.2. Practical Competence

Practical competence refers to graduates’ ability to apply vocational knowledge and skills effectively in work-related contexts. It is measured using items related to task execution, problem-solving ability, and adaptability in practical settings. The construct emphasises applied skill performance, which is central to vocational education outcomes.

3.4.3. Graduate Employability

Graduate employability is measured using indicators related to employment preparedness and early career outcomes. Items reflect perceived employability, relevance between training and occupational requirements, and confidence in job acquisition and performance. The construct captures both objective and subjective dimensions of employability, consistent with contemporary employability research.

All latent variables are specified as reflective constructs, based on the assumption that observed indicators represent manifestations of underlying theoretical concepts.

3.5. Analytical Strategy

The hypothesised mediation model is estimated using SEM with maximum likelihood estimation. Model fit is assessed using commonly reported goodness-of-fit indices, including the Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardised Root Mean Square Residual (SRMR). These indices are interpreted using threshold values commonly adopted in applied social science research as reference points rather than rigid cut-off criteria.

To test the mediating effect of practical competence, indirect effects are estimated using bootstrapping procedures with bias-corrected confidence intervals. This approach provides a robust assessment of mediation effects without relying on normality assumptions. Regression-based mediation analysis is further conducted as a robustness check, and consistency between the two approaches is used to strengthen confidence in the findings.

3.6. Methodological Considerations

Several methodological considerations warrant clarification. First, the sample size of 1,528 observations is adequate for the specified mediation-focused SEM, given the model's limited complexity and confirmatory orientation. Second, potential common method bias is mitigated through careful questionnaire design and procedural remedies, as well as the use of multiple data collection modes.

Finally, the study deliberately prioritises analytical parsimony by focusing on a single, theoretically grounded mediating mechanism. While other pathways influencing employability may exist, practical competence is emphasised due to its central role in vocational education theory, empirical observability, and institutional measurability. This design choice enhances interpretability and analytical coherence.

4. RESULTS

This section reports the empirical findings derived from the questionnaire survey conducted among university students in four higher education institutions in Dongying City. The results are organised around four key dimensions: students' cognition and participation motivation, the integration of training content with enterprise practice, the effectiveness of training formats and instructional methods, and the development of information-based training platforms.

4.1. Student Cognition and Participation Motivation

The survey results reveal a pronounced deficiency in students' cognitive awareness of vocational skills training. Among the 1,505 valid responses, only 5.0% of students reported being "very familiar" with the existing vocational skills training system, while 10.0% indicated a basic level of understanding. In contrast, 79.0% stated that they were "not very familiar", and an additional 6.0% reported being "completely unfamiliar" with vocational skills training arrangements.

Sources of awareness were highly fragmented. Among students who reported some level of

understanding, 23.8% obtained information through online channels, 6.1% through profession-related certification systems, 5.1% through enterprise internships, and 3.8% through peer communication. Notably, 5.6% of respondents indicated no exposure to vocational skills training information at all. These figures suggest that formal institutional channels play a limited role in shaping student awareness.

Participation motivation is strongly employment-oriented. A total of 78.6% of respondents identified the enhancement of employment competitiveness as their primary reason for participating in vocational skills training, whereas only 12.3% cited professional extension or academic enrichment. This utilitarian orientation indicates that vocational skills training is predominantly perceived as an instrumental pathway for labour market entry rather than as an integral component of holistic capability development.

Economic constraints further shape participation decisions. The data show that 67.4% of students were only willing to participate in training programmes priced at or below 1,000 RMB. Cost sensitivity varied significantly across demographic groups, with students from rural backgrounds exhibiting approximately 35% higher sensitivity to training costs than their urban counterparts. These findings indicate the presence of a clear economic threshold effect influencing know a lot about participation.

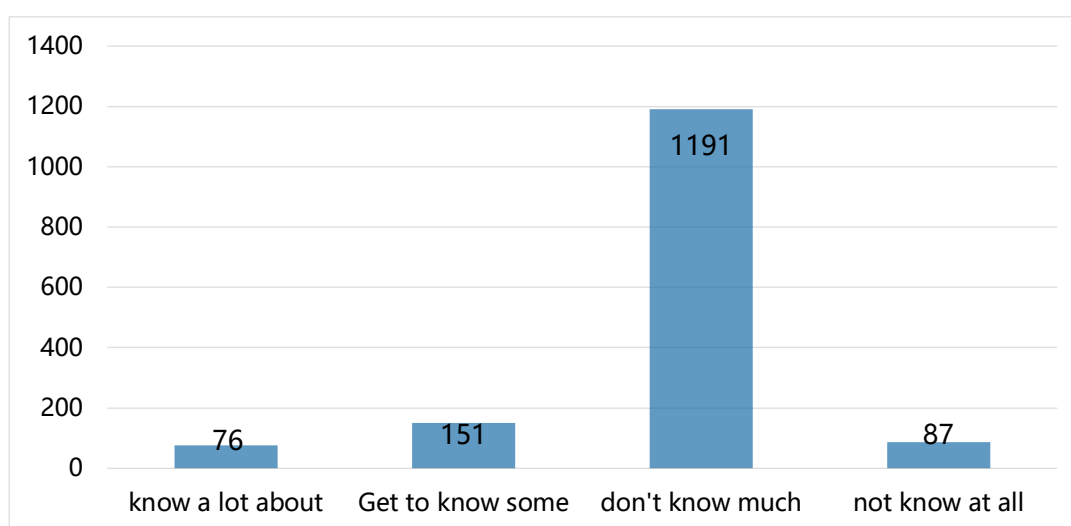


Figure 4.1: Be aware of the details of the vocational skills training programs offered by the school where one is enrolled.

4.2. Integration of Training Content and Enterprise Practice

The results indicate a substantial misalignment between vocational training content and enterprise practice requirements. Only 29.1% of students perceived training content as closely aligned with actual enterprise needs. This misalignment is particularly evident in rapidly evolving sectors such as information technology and finance, where curriculum adaptability received an average evaluation score of 2.8 out of 5.

Demand–supply discrepancies in practical training resources are pronounced. While 76.5% of students expressed a strong desire to participate in real enterprise projects, only 34.0% reported having access to such opportunities through their institutions. The gap between demand and

supply for authentic enterprise project participation reaches 46.2 percentage points.

Similarly, access to industry mentor guidance remains limited. Although 57.4% of students expressed a strong demand for guidance from enterprise practitioners, only 38.5% reported receiving such support during training. These results indicate that existing training models remain dominated by theoretical instruction and low-level simulations, with limited exposure to real industrial scenarios.

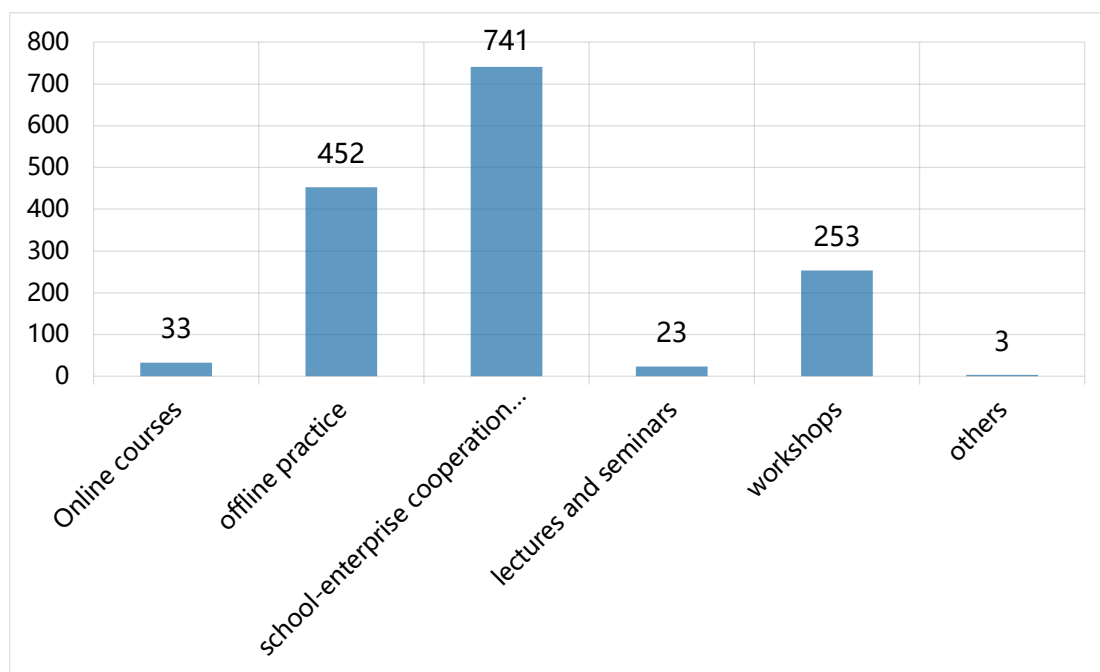


Figure 4.2: What resources do you think the school should provide in terms of vocational skills training?

4.3. Training Formats, Instructional Methods, and Learning Effectiveness

Students' preferences regarding training formats demonstrate a clear inclination toward practice-oriented and blended learning approaches. A total of 74.3% of respondents favoured a blended model combining online theoretical instruction with offline practical training, whereas only 12.8% expressed acceptance of fully online training formats.

Concerns regarding fully online training primarily relate to self-regulation and interaction. Approximately 68.9% of students reported difficulties maintaining learning discipline in online-only environments, along with insufficient engagement. In terms of instructional methods, traditional lecture-based teaching was rated as the least effective (28.4%), while scenario-based case teaching (81.7%) and project-based learning (76.2%) were widely perceived as the most effective methods for skill development.

Instructor-related factors also constrain training effectiveness. A total of 65.3% of respondents indicated that instructors lacked up-to-date industry experience, leading to perceived delays in content updates and reduced relevance to current market demands. In contrast, 88.6% of students expressed strong support for the involvement of industry practitioners in teaching activities.

4.4. Development of Information-Based Training Platforms

The results further reveal structural limitations in the construction and utilisation of information-based vocational training platforms. Institutional platforms exhibit low utilisation rates, with only 19.4% of students reporting active use. The primary reasons cited include insufficient resource availability (73.6%) and slow content updates (68.2%).

In contrast, third-party online platforms demonstrate higher penetration rates (71.5%), but completion rates remain below 30%, reflecting a lack of targeted guidance and supervision. This indicates a mismatch between general-purpose online learning platforms and the specific requirements of vocational competency development.

Students reported strong demand for enhanced platform functionality. Key functional expectations include learning path planning (77.3%), job-skill matching diagnosis (68.9%), and learning data visualisation (62.4%). While basic functions such as course uploading are widely available (92.1%), advanced intelligent features are present in fewer than 15% of platforms. As a result, platforms primarily function as static repositories rather than integrated learning support systems.

Table 1: Supply-Demand Gap in Practical Training Forms

Practical Form	Student Demand (%)	Institutional Supply Rate (%)	Supply-Demand Gap (%)
Real Enterprise Projects	68.3%	22.1%	46.2%
Industry Mentor Guidance	57.4%	38.5%	18.9%
Simulation Scenario Drills	49.2%	45.3%	3.9%

4.5. Summary of Results

Overall, the results demonstrate that vocational skills training effectiveness is constrained by weak student cognition, insufficient integration of theory and practice, limited adaptability of training formats, and underdeveloped information-based platforms. These factors jointly shape participation behaviour, skill acquisition processes, and employability-related outcomes, providing a clear empirical basis for the subsequent discussion and policy implications.

5. DISCUSSION

This study examined the impact of digitalised and intelligence-oriented vocational skills training on graduate employability among university students, with a particular focus on the mediating role of practical competence. Drawing on survey data from four higher education institutions in Dongying City, the findings provide empirical support for the proposed hypotheses and offer insight into how students' training experiences shape employability-related outcomes.

5.1. Digitalised Vocational Skills Training and Graduate Employability

Consistent with Hypothesis 1, the empirical results indicate that participation in digitalised vocational skills training is positively associated with graduate employability. Students who reported higher levels of engagement in digitally supported training programs demonstrated stronger employment preparedness and greater confidence in their career prospects.

However, the survey findings also reveal that students' cognitive perceptions of vocational skills training play a critical moderating role. A considerable proportion of respondents perceived vocational skills training as a supplementary activity rather than a core component of employability development. This limited recognition weakens engagement intensity and partially constrains training effectiveness. This result extends existing employability research by highlighting that digitalised training alone is insufficient unless accompanied by adequate student awareness and motivation.

From a human capital perspective, vocational skills training contributes to employability only when learners recognise its instrumental value and actively invest effort in skill acquisition. The findings therefore suggest that employability gains depend not merely on training provision, but also on students' cognitive alignment with training objectives.

5.2. Practical Competence as a Mediating Mechanism

The results strongly support Hypothesis 2, demonstrating that practical competence functions as a key mediating mechanism between digitalised vocational skills training and graduate employability. Students exposed to training programs that integrated practical tasks with digital learning resources reported higher levels of applied skill readiness.

Nevertheless, the survey evidence indicates that theoretical instruction remains dominant in many training modules, with insufficient embedding of hands-on practice. This imbalance limits the conversion of theoretical knowledge into operational competence, thereby reducing the overall employability impact. These findings echo long-standing concerns in vocational education literature regarding the theory–practice divide.

Situated learning theory provides a useful interpretive lens for this result. When training lacks authentic or practice-oriented components, students struggle to internalise skills in ways that are transferable to real work contexts. Thus, the mediating role of practical competence is highly sensitive to how effectively theory and practice are integrated within the training process.

5.3. Training Forms, Methods, and Skill Development Effectiveness

In line with Hypothesis 3, the findings suggest that the form and method of vocational skills training significantly influence learning outcomes. Students responded more positively to flexible, interactive, and application-oriented training formats, while traditional, lecture-based approaches were often perceived as monotonous and disengaging.

The data indicate that outdated training methods reduce learning motivation and weaken skill acquisition, particularly among students with diverse learning preferences. Digital platforms, when used primarily as content delivery tools rather than interactive learning environments, showed limited added value. This finding underscores that digitalisation should be understood as a pedagogical transformation rather than a purely technological upgrade.

5.4. Information-Based Training Platforms and Employability Alignment

The analysis further suggests that information-based vocational training platforms contribute to improved employability when they are effectively integrated into the training system. Platforms that support resource sharing, practice coordination, and training information

dissemination enhance students' access to learning opportunities and improve the coherence of the training experience.

However, the results also indicate variability in platform effectiveness across institutions, largely due to differences in utilisation depth and institutional support. Where platforms function mainly as administrative tools, their contribution to employability remains limited. This finding highlights that the employability impact of digital platforms depends on their functional integration into teaching and learning processes rather than their mere existence.

5.5. Theoretical Implications

This study contributes to employability research by empirically validating a mediation pathway in which vocational skills training influences employability primarily through practical competence development. Unlike studies that treat employability as a direct outcome of training participation, the findings clarify the mechanism through which training effects materialise.

Furthermore, the results extend human capital theory by emphasising that applied competence, rather than theoretical knowledge accumulation alone, constitutes the most critical form of employability-relevant capital in vocationally oriented higher education. Digitalised training enhances this capital only when it supports meaningful practice and skill application.

5.6. Boundaries and Conditions for Interpretation

Several boundary conditions should be noted when interpreting the findings. First, the results are based on data from vocationally oriented higher education institutions within a single regional context, which may limit generalisability to other institutional or national settings. Second, while the study identifies key training-related mechanisms, employability outcomes are also shaped by external labor market conditions that fall beyond the scope of this analysis.

5.7. Summary of Discussion

In summary, this study demonstrates that digitalised vocational skills training can enhance graduate employability primarily by strengthening practical competence. However, the effectiveness of such training is contingent upon students' cognitive recognition of its value, the integration of theory and practice, and the appropriateness of training forms and information-based platforms. These findings provide a coherent explanation of the hypothesised relationships and lay the foundation for targeted institutional and policy responses discussed in the following section.

6. CONCLUSION AND IMPLICATIONS

This study examined the effectiveness of digitalized vocational skills training in enhancing the employability of university students within the context of China's evolving labor market. By integrating human capital theory, career development theory, and situated learning theory, the research provides empirical evidence that digitally mediated vocational training constitutes a viable and impactful approach to addressing the persistent mismatch between higher education outcomes and labor market demands.

The findings indicate that digital vocational skills training significantly improves students' practical competencies, career awareness, and perceived job readiness. Unlike traditional

academic-oriented instruction, digitally supported training environments enable continuous practice, immediate feedback, and exposure to authentic work-related tasks. These features are particularly valuable for university students who often lack opportunities for direct workplace engagement during their studies.

From a theoretical perspective, this study extends existing employability research by situating vocational skills training within university education rather than limiting it to vocational institutions. It demonstrates that employability should be understood as a multidimensional construct shaped not only by individual attributes but also by learning environments, institutional design, and regional economic contexts. By highlighting the role of digital platforms as simulated communities of practice, the study contributes to a deeper understanding of how situated learning principles can be operationalized in digitally mediated higher education settings.

Practically, the findings suggest that universities should strategically integrate vocational skills training into academic curricula rather than treating it as a supplementary or peripheral activity. The adoption of digital platforms allows institutions to deliver flexible and scalable training programs while maintaining alignment with industry standards. Moreover, strengthened collaboration between universities and enterprises can enhance the relevance of training content and facilitate smoother transitions from education to employment.

From a policy perspective, the case of Dongying City illustrates the importance of aligning vocational skills training with regional industrial structures and economic development strategies. Policymakers should support institutional frameworks that encourage school–enterprise collaboration, digital infrastructure investment, and regionally differentiated training models. Such initiatives can simultaneously improve graduate employability and contribute to regional workforce development.

Despite its contributions, this study has several limitations. The reliance on self-reported data may introduce perceptual bias, and the regional focus limits the generalizability of the findings. Future research could employ longitudinal designs, comparative regional analyses, or quantitative modeling approaches to further examine the causal relationships between digital vocational training and employment outcomes.

In conclusion, digitalized vocational skills training represents a promising pathway for reorienting higher education toward employability-driven development. By bridging the gap between academic learning and labor market requirements, digitally enabled vocational training can play a critical role in supporting sustainable graduate employment and regional economic resilience

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CONFLICT STATEMENT

The authors declare no conflict of interest.

COOPERATION STATEMENT

All authors contributed equally to this work and approved the final manuscript.

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