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Reconstructing Vocational Teacher Capacity in AI-Enabled Industry-Education Integration: A Policy and Institutional Analysis of Liaoning Province

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Abstract: The digital transformation of vocational education has moved beyond the question of whether teachers should use digital tools. In regions where industrial renewal and vocational reform overlap, the more difficult question is how teachers' professional capacity should be rebuilt when artificial intelligence, data-based training resources and school-enterprise co-development become part of everyday institutional work. Taking Liaoning Province as the analytical setting, this paper examines how vocational teachers' roles are being reorganised under three connected pressures: the spread of AI-enabled pedagogy, the demand for deeper industry-education integration and the regional need to support industrial upgrading. The study adopts qualitative document analysis of international frameworks, Chinese national policy documents, Liaoning provincial education documents and recent empirical studies on TVET teacher digital competence. The findings suggest that teacher role change is better understood as capacity reconstruction than as simple role replacement. Four dimensions are identified: curriculum translation between occupational tasks and learning outcomes, AI-assisted instructional design and verification, boundary work in school-enterprise cooperation, and ethical stewardship of digital assessment and learner data. The paper argues that AI application strengthens vocational education only when it is embedded in industry-linked curriculum renewal and supported by organisational arrangements for teacher development. For vocational colleges in Liaoning, the practical priority is not to train teachers to operate isolated tools, but to build collaborative mechanisms through which teachers, enterprises and digital platforms jointly update curriculum, assessment and workplace learning. The paper offers a regional policy-informed framework for managing vocational teacher development in AI-enabled vocational education.

Keywords: Vocational Education; Artificial Intelligence; Teacher Capacity; Industry-Education Integration; School-Enterprise Co-Development; Digital Pedagogy; Liaoning Province

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1. Introduction

Technical and vocational education and training has again become a strategic site for economic and social policy. It is expected to prepare learners for employment, support lifelong learning, absorb the pressure of industrial restructuring and, increasingly, help societies move towards digital and green transitions[1]. In China, this expectation has been reinforced through the National Vocational Education Reform Implementation Plan and the revised Vocational Education Law, both of which reposition vocational education as a type of education with its own value rather than a secondary route below general education[2,3]. These policy shifts matter for teachers because the quality of vocational education is not determined only by equipment, platforms or enrolment scale. It depends on whether teachers can connect changing occupational standards with learnable curriculum, practical training and credible assessment.

Artificial intelligence has sharpened this issue. The rapid diffusion of generative AI, learning analytics, intelligent tutoring systems and simulation-based training has made it easier to produce lesson materials, demonstrations, feedback and practice tasks. Yet the same technologies also create new risks: plausible but inaccurate technical explanations, over-automated feedback, weak data protection, algorithmic bias and a widening gap between platform functions and actual workplace requirements. UNESCO's guidance on generative AI therefore stresses human-centred governance, while its AI competency framework for teachers treats AI literacy as a matter of professional judgement, ethics and pedagogy, not merely tool operation[4,5]. For vocational education, these concerns are especially acute because teaching errors may affect not only examination performance but also occupational safety, production standards and learners' capacity to transfer knowledge into real work.

The teacher's role in vocational education has never been limited to classroom instruction. The OECD's review of teachers and leaders in vocational education describes VET teachers as a workforce located between pedagogical institutions and the labour market, requiring access to up-to-date occupational knowledge, practical experience and professional development[6]. Empirical studies have reached a similar conclusion from the digital competence side. Research on Chinese TVET teachers has found that digital competence is influenced by both personal and institutional factors, indicating that teacher development cannot be reduced to individual willingness or age-related familiarity with technology[7]. Studies in European contexts further show that vocational teachers' technology use depends on perceived usefulness, confidence, workload and the teaching profile in which the teacher works[8,9]. Pre-service vocational teacher research also indicates that digital competence is multidisciplinary, combining technical knowledge, motivational factors, cognitive strategies and pedagogical application[10].

This article takes Liaoning Province as a regional case because it sits at the intersection of vocational education reform and industrial renewal. Liaoning is a traditional industrial base with policy attention to equipment manufacturing, petrochemicals, shipbuilding, robotics, aviation, digital manufacturing and new service industries. Its education plan calls for the construction of digital vocational education, digital teaching resources, online open courses, vocational education data platforms and learning platforms, while also supporting modern apprenticeship, school-enterprise dual education and the incorporation of new technologies, processes and standards into teaching content[11]. More recent provincial education materials report the establishment of industry-education communities in fields such as petrochemicals, robotics, shipbuilding and aviation, together with municipal industry-education alliances, school-enterprise training bases and projects linked to regional industrial needs[12]. These developments make Liaoning a useful setting for examining how teacher roles are being reshaped by the combined force of AI application and school-enterprise co-development.

The paper deliberately avoids treating AI as an autonomous force that simply changes teachers from outside. Such a view overstates the technology and understates the institutional work required to make digital transformation meaningful. In vocational colleges, AI can draft, recommend, classify, simulate and assess, but it cannot by itself decide which occupational tasks are worth teaching, which standards should be translated into learning outcomes, or how students' weak performance in a simulated task should be interpreted. These tasks still require teachers who understand industry practice, learners' development and institutional constraints. At the same time, the traditional idea of the vocational teacher as a stable transmitter of occupational knowledge is also insufficient. When technologies and production processes change quickly, teachers must become interpreters, designers, validators and coordinators.

From an economic and management perspective, this issue should be understood as a problem of regional human-capital governance. Liaoning's vocational colleges are not only education providers; they are organisations through which industrial policy, enterprise demand and labour-market transition are translated into trainable capabilities. Teacher capacity is thus a managerial asset. When it is weak, digital investment may remain at the level of platform purchase. When it is strong, the same investment can support curriculum updating, learner employability and enterprise-facing innovation. The teacher becomes a site where regional development strategy is operationalised.

The guiding research question is therefore: how should vocational teachers' professional capacity be reconstructed when AI application and industry collaboration are treated as mutually connected conditions of digital transformation? The article answers this question through a qualitative analysis of policy documents and research literature. It contributes a framework that links teacher capacity reconstruction to four forms of work: translating occupational change into curriculum, designing and checking AI-supported learning, brokering school-enterprise knowledge flows, and safeguarding ethics and learner development. Rather than asking whether teachers will be replaced by AI, the article asks what kinds of judgement and organisational support are needed for teachers to use AI responsibly within vocational education.

2. Materials and Methods

2.1 Research Design

The study uses qualitative document analysis. This method is appropriate because the transformation of vocational education is being advanced through policies, standards, institutional plans and professional development schemes before it becomes fully visible in routine classroom practice. Document analysis allows the researcher to examine how problems are defined, how responsibilities are allocated and how specific forms of professional capacity are made thinkable within policy discourse[13]. To strengthen interpretive discipline, the analysis was guided by content-analytic principles: documents were read for recurring categories, explicit policy requirements, implied role expectations and tensions between different levels of governance[14]. The purpose was not to measure teachers' actual behaviour in a statistical sense, but to reconstruct the professional logic that current policy and research attach to vocational teachers under AI-enabled digital transformation.

2.2 Document Corpus

The document corpus included four types of materials. The first group consisted of international frameworks on TVET, AI in education and vocational teacher development, including UNESCO and OECD publications. These texts helped establish the broader conceptual vocabulary concerning human-centred AI, teacher agency and work-based relevance. The second group consisted of Chinese national policy documents on vocational education, teacher digital literacy and AI-related educational transformation. The third group consisted of Liaoning provincial education documents, including the provincial education development plan and public replies or reports concerning vocational education, teacher development, school-enterprise cooperation, professional capability mapping and digital-intelligence literacy. The fourth group consisted of peer-reviewed empirical studies on vocational teachers' digital competence, technology use and boundary-crossing identity. This mixed corpus was selected because teacher role reconstruction is simultaneously a policy, institutional and professional phenomenon.

The inclusion criteria were relevance to vocational education, teacher work, digital transformation, AI application, school-enterprise cooperation or Liaoning's vocational education reform. Documents were excluded when they discussed general digital economy policy without an education component, when they dealt only with basic education, or when they made claims about AI without connecting them to teacher work or institutional governance. Although the corpus did not seek exhaustive coverage of all documents published in China, it was designed to capture the main policy and research signals shaping vocational teacher capacity in the Liaoning context.

2.3 Analytical Procedure

The analysis proceeded in three rounds. In the first round, all documents were coded for explicit references to teachers, AI, digital resources, curriculum reform, workplace training, school-enterprise cooperation and assessment. In the second round, these codes were grouped into broader categories of teacher work: curriculum design, technological application, industry translation, learner support, assessment and ethical governance. In the third round, the categories were compared across international, national and Liaoning-level documents. This comparison was important because international frameworks tend to emphasise human agency and ethics, national documents tend to emphasise system-building and standards, and provincial documents tend to emphasise implementation, industrial fit and training mechanisms. The four findings reported below were derived from convergence and tension across these layers.

Two precautions were taken to avoid over-interpretation. First, the study distinguishes between policy intention and classroom reality. A policy document may require school-enterprise cooperation or AI literacy training, but such requirements do not automatically prove that teachers already possess the necessary competence. Second, the analysis treats Liaoning as a policy-informed regional case, not as a statistically representative sample of all Chinese provinces. The argument is strongest where it identifies institutional pathways and professional demands; it does not claim to measure the prevalence of those pathways among all vocational teachers.

3. Results

3.1 From Technical Updating to Capacity Reconstruction

The first finding is that vocational teacher development is moving from technical updating towards broader capacity reconstruction. In older forms of in-service training, digital transformation could be understood as adding a new platform or teaching software to an otherwise stable curriculum. Current documents imply a different situation. Liaoning's education plan connects digital vocational education with professional digital upgrading, online open courses, data platforms, student-centred classroom reform and the inclusion of new technologies, processes and standards in teaching content[11]. This combination is significant. It suggests that teachers are not merely expected to digitise existing lessons; they are expected to rethink what should be taught and how occupational knowledge should be organised when industries themselves are changing.

Capacity reconstruction therefore has at least three layers. The first is operational: teachers must know how to use digital platforms, simulation environments, AI tools and online resources. The second is pedagogical: teachers must convert these tools into learning designs that support practice, reflection and transfer. The third is occupational: teachers must maintain enough contact with industry to understand how digital systems are actually used in workplaces. A teacher who can operate a platform but cannot judge whether a generated case reflects current production practice has only partial digital competence. Conversely, a teacher with rich occupational experience but little capacity to design hybrid or AI-supported learning will find it difficult to help students practise in new digital environments.

The revised understanding of capacity also changes the meaning of the double-qualified teacher. In many vocational systems, the double-qualified teacher has been described as someone with both teaching competence and occupational competence. Under AI-enabled digital transformation, this duality becomes more complex. Teachers are required to connect pedagogical knowledge, occupational knowledge and digital judgement. Liaoning's public response on improving professional-course teachers' skills highlights the role of enterprises in teacher development, naming industry organisations and firms that participate in training design, course teaching and practical operation so that production and technical resources can be opened to vocational education[15]. This is not only a mechanism for updating skills. It is a way of making teachers' occupational knowledge current enough to support digital curriculum renewal.

The policy implication is that the target of teacher development should not be a generic digitally competent teacher, but a teacher able to handle the relationship between digital tools and occupational change. This distinction matters for college management. If professional development is defined narrowly as software training, teachers may learn to produce more digital materials without improving the relevance of student learning. If it is defined as capacity reconstruction, then the training agenda must include work-task analysis, curriculum redesign, AI-assisted resource evaluation, digital assessment, collaborative lesson study and periodic industry immersion. This broader agenda is more demanding, but it better matches the kind of teacher work now required in vocational education.

3.2 AI Application and the Teacher as Designer, Validator and Steward

The second finding concerns AI application. The documents and literature do not support a simple replacement narrative. AI can assist with lesson preparation, resource generation, student feedback, formative assessment, simulation and administrative work, but these functions increase rather than remove the need for teacher judgement. UNESCO's framework identifies human-centred mindset, ethics, AI foundations, AI pedagogy and professional learning as dimensions of teacher AI competence[5]. In vocational education, each dimension has a practical form. Teachers must know when AI-generated explanations are technically reliable, when a simulation oversimplifies workplace conditions, when automated feedback misses a safety-critical error, and when student data should not be used for certain forms of prediction.

The teacher's design role becomes more visible when AI is used in practical training. A vocational teacher may ask an AI system to generate a troubleshooting scenario for a manufacturing line, a customer service dialogue, a logistics routing problem or a nursing communication exercise. The output may be useful, but it still requires professional checking. The teacher must judge whether the task reflects the right level of difficulty, whether the terminology is aligned with current industry usage, whether the case encourages procedural compliance or deeper problem-solving, and whether assessment criteria are transparent. In this sense, AI shifts part of the teacher's work from producing every resource manually to curating, adapting and validating resources. The labour is different, not absent.

The validation role is particularly important in vocational education because many learning tasks carry embedded safety and quality standards. A language error in a general essay prompt may be inconvenient; a misleading maintenance procedure, chemical handling step or machine operation instruction can be dangerous. AI systems are also prone to presenting answers with a degree of fluency that can hide uncertainty. Teachers must therefore teach students not only how to obtain AI-generated information, but how to interrogate it. This is a curricular issue. Students in vocational programmes need habits of verification: checking against technical manuals, comparing with enterprise standards, consulting experienced workers, and explaining why a proposed solution is acceptable in a given workplace context.

The stewardship role is equally important. AI-supported teaching can generate data on student progress, mistakes, response time and behavioural patterns. Used carefully, such data can help teachers identify weak skills and personalise practice. Used carelessly, it can narrow learning to what is easily measurable, stigmatise learners or create opaque forms of surveillance. The Ministry of Education's Teacher Digital Literacy standard emphasises teachers' awareness, ability and responsibility in using digital technology to optimise and transform teaching activities[16]. The 2026 AI + Education Action Plan goes further by calling for teacher AI literacy standards, classified training and assessment systems, as well as AI support for lesson preparation, learning analysis and digital resource generation[17]. These policy signals imply that AI-related teacher competence must include ethical restraint and data governance.

A practical consequence is that vocational colleges should not evaluate AI use by counting how many teachers have used a tool. A more meaningful evaluation would ask whether AI use improves occupationally authentic learning, whether generated materials are checked by teachers and enterprises, whether students learn verification practices, and whether data use is transparent. The teacher remains the professional agent who decides what counts as good evidence of learning. AI can expand the evidence base, but it cannot replace the normative judgement embedded in vocational education.

3.3 School-Enterprise Co-Development and Teacher Boundary Work

The third finding is that industry collaboration mediates AI-enabled teacher role reconstruction. Digital transformation in vocational education becomes superficial if it is confined to campus platforms. Occupations are transformed in enterprises, workshops, service systems and production networks. Teachers therefore need channels through which workplace changes enter curriculum. Recent vocational teacher literature describes such work as boundary crossing: teachers move between educational and occupational communities, and their professional identity is formed through negotiating these different expectations[18]. Under AI conditions, the boundary becomes more complicated because digital tools can simulate work without guaranteeing that the simulation reflects actual workplace practice.

Liaoning's policy materials show that school-enterprise cooperation is no longer framed only as internship placement. The province has reported industry-education communities in petrochemicals, robotics, shipbuilding and aviation, municipal industry-education alliances, 555 school-enterprise practice and training bases, and project connections among 617 member units[12]. It has also reported efforts to match enterprise post requirements with vocational education resources through modern apprenticeship and on-site engineer training, along with the construction of professional capability maps based on regional industrial needs[19]. These initiatives indicate that the relevant unit of collaboration is not a single enterprise visit but a network of curriculum, training base, capability model and employment demand.

For teachers, this creates a boundary-broker role. They must translate enterprise needs into educational tasks, and translate educational limits back to enterprises. Enterprises may want graduates who can immediately operate a system; colleges must also build students' conceptual understanding, adaptability and professional ethics. AI tools can help map skills, generate practice cases and analyse performance data, but the alignment between enterprise post requirements and curriculum still depends on human negotiation. Teachers are often the people who see where the translation fails: an enterprise standard may be too narrow for a course, a platform simulation may not match the workshop sequence, or a student assessment may reward completion speed while ignoring diagnostic reasoning.

Boundary work also changes professional development. Enterprise participation in teacher training is useful when it gives teachers access to current equipment, standards, work organisation and typical faults. It is less useful when it becomes ceremonial cooperation with limited curricular influence. Liaoning's response on teacher professional skills explicitly states that leading enterprises and industry resources are invited to participate in training programme design, course teaching and hands-on practice, with the aim of opening production and technical resources to vocational education[15]. This provides a concrete route for teacher capacity reconstruction, but its effect depends on whether teachers return from enterprise training with time and authority to revise syllabi, teaching materials and assessments.

The same point applies to AI. If enterprises use AI-supported production planning, predictive maintenance, digital twins, intelligent quality inspection or data-based customer management, teachers need to understand these uses as occupational practices rather than abstract examples of digitalisation. School-enterprise co-development should therefore involve joint selection of AI-supported teaching cases, joint validation of digital resources and joint assessment of student competence. Teachers become the hinge of this process. They are neither passive recipients of enterprise requirements nor independent designers detached from work. Their role is to make collaboration educationally meaningful.

3.4 Liaoning-Specific Pathways for Implementation

The fourth finding concerns implementation pathways for Liaoning. The province's context favours a model in which digital teacher development is linked to regional industrial clusters. The education plan already emphasises digital vocational education, new technologies and school-enterprise textbook development[11]. Later provincial materials describe professional capability maps, revised training plans, curriculum reconstruction, process-based evaluation and capability portraits, with 94 professional maps initiated and new or withdrawn higher vocational majors adjusted according to quality and industrial needs[19]. These measures point to a data-informed approach to curriculum governance. The challenge is to ensure that teacher development is built into the same governance system rather than treated as a separate training task.

A first pathway is to organise teacher development around professional groups rather than around isolated digital tools. For example, teachers in equipment manufacturing, petrochemicals, robotics, shipbuilding, health services and digital commerce face different AI and data practices. A single AI training course may introduce prompt writing, but it cannot show how AI changes fault diagnosis in smart manufacturing or compliance documentation in a service industry. Professional-group training can link tool use with occupational tasks, enterprise standards and student assessment. It also allows teachers within a specialty to build shared repositories of verified cases, rubrics and simulation scripts.

A second pathway is to establish joint validation routines. Whenever an AI-generated case, simulation, assessment rubric or digital resource is introduced into a vocational course, it should be checked by at least two forms of expertise: pedagogical expertise from teachers and occupational expertise from enterprise partners or industry mentors. The purpose is not to slow down innovation but to prevent inaccurate or inauthentic resources from becoming normalised. This is particularly important for professional courses where students learn procedures, safety norms, technical standards or client-facing judgement. Joint validation also gives enterprises a substantive role in curriculum quality instead of limiting them to internship provision.

A third pathway is to use capability maps as teacher learning tools. Professional capability maps are often designed to improve student training alignment, but they can also reveal what teachers themselves need to learn. If a map shows that a programme requires new competence in data-driven inspection, intelligent equipment operation or digital service design, colleges can identify which teachers are prepared, which need enterprise practice, and which need AI pedagogy support. The teacher development plan then becomes evidence-informed. It can be linked to workload, promotion, teaching innovation projects and team teaching rather than being offered as optional workshops.

A fourth pathway is to build regional communities of practice. Liaoning's regional digital transformation seminars and vocational education digital innovation activities indicate that the province is already creating spaces for exchange around online education, digital empowerment, industry-education integration and talent cultivation[20]. These activities can be strengthened if they move beyond experience-sharing and develop into sustained communities where colleges compare teaching cases, evaluate AI-supported resources, discuss failed experiments and co-produce guidelines for ethical AI use. Teachers are more likely to adopt demanding innovations when they can see how colleagues in similar disciplines solve practical problems.

Taken together, these pathways suggest a shift in management attention. The key question is not how many teachers attended AI training, but whether teacher development is connected to professional-group curriculum renewal, enterprise validation, capability maps and regional knowledge sharing. Liaoning has several policy instruments that can support this connection. Their effectiveness depends on coordination at the college level: departments need time for collaborative design, teachers need access to enterprise practice, and leadership needs criteria for recognising boundary work and digital resource validation as legitimate professional labour.

4. Discussion

The findings indicate that vocational teacher roles are being reshaped through a layered process. AI application changes the tools and evidence available for teaching. Industry collaboration changes the source and pace of occupational knowledge. Provincial policy changes the organisational channels through which these demands reach colleges. Teacher role reconstruction happens where these layers meet. This is why the language of replacement is misleading. A teacher who only lectures from fixed materials may indeed be vulnerable to automation. A teacher who designs occupationally authentic learning, checks AI outputs, negotiates with enterprises and supports learner judgement performs work that AI cannot absorb as a simple technical function.

The analysis also clarifies why digital competence should not be treated as an individual attribute detached from institutional context. Empirical studies show that teachers' digital competence and technology use are affected by access, confidence, perceived usefulness, workload and professional profile[7-9]. In vocational education, these factors are intensified by the need to remain occupationally current. A teacher may be willing to use AI but lack enterprise-validated cases. Another may understand industry practice but be overloaded by teaching and administrative work, leaving little time to redesign digital assessment. Capacity reconstruction therefore requires institutional design: workload allocation, team structures, enterprise access, leadership support, ethical rules and shared resource systems.

For vocational colleges, one managerial implication is to treat AI as part of curriculum governance. AI tools should be reviewed through the same quality lens as textbooks, training equipment and assessment standards. Colleges may establish AI resource review groups at the professional-group level, including teachers, enterprise experts, instructional designers and data protection personnel. Such groups can decide which tools are appropriate, what evidence is required before a generated case enters teaching, how students should disclose AI assistance, and how teachers should document their validation work. This approach avoids both uncritical adoption and excessive prohibition.

This governance view also changes how college leaders should allocate resources. Budgeting for AI-enabled vocational education should include time for teachers to test resources, incentives for cross-departmental course teams, travel or release time for enterprise practice, and support staff who understand data security and instructional design. Without these managerial conditions, teachers may be blamed for slow adoption even when the real constraint is organisational. A college that values only visible digital outputs will encourage quick production of materials; a college that values professional validation will invest in the less visible work that makes those materials credible.

A second implication concerns professional development. Traditional short workshops are unlikely to produce deep change unless they are attached to classroom redesign. International teacher policy increasingly emphasises sustained support, collaboration and working conditions rather than isolated training events[21,22]. For Liaoning's vocational colleges, this suggests that AI-related training should be organised as design cycles: teachers identify a course problem, study the relevant occupational tasks, work with enterprise partners, build or adapt AI-supported materials, pilot them with students, review evidence and revise. The output is not a certificate of attendance but an improved teaching unit, rubric, simulation or workplace learning task.

A third implication is that ethical AI use should be normalised as part of vocational professionalism. UNESCO's recent discussion of AI and the future of education stresses that AI brings dilemmas around equity, misinformation, agency and human-machine co-creation[23]. In vocational education, ethical AI is not an abstract topic. Students may use AI to produce technical reports they do not understand; teachers may use automated scoring without explaining criteria; colleges may collect learner data without clear limits; enterprises may provide proprietary process information that should not be entered into open AI systems. Teachers need institutional rules, but they also need ethical judgement cultivated through cases and peer discussion.

The analysis offers a modest theoretical contribution. It reframes vocational teacher role change as mediated capacity reconstruction. AI application and industry collaboration are not parallel variables acting separately. AI becomes educationally valuable when it is connected to authentic work and teacher judgement; industry collaboration becomes pedagogically valuable when teachers can translate enterprise knowledge into curriculum and assessment. The teacher's reconstructed capacity therefore sits between technology, workplace and learner. This position is demanding because it requires the teacher to hold together different standards of validity: technical correctness, pedagogical accessibility, occupational authenticity and ethical acceptability.

There are also risks. First, teacher capacity reconstruction may become another layer of workload without adequate time or recognition. If teachers are asked to design AI resources, maintain enterprise links, update courses and manage data while their teaching load remains unchanged, reform may produce fatigue rather than innovation. Second, school-enterprise cooperation may privilege large firms and visible technologies, while smaller enterprises and service occupations receive less attention. Third, AI tools may standardise teaching materials in ways that reduce local adaptation. Liaoning's industrial diversity requires plural models, not a single digital template.

Future empirical research should therefore examine how teachers actually experience these reforms. Interviews, classroom observations and design-based studies could test whether the four dimensions identified in this paper appear in practice. Quantitative studies could examine whether participation in enterprise-validated AI curriculum design is associated with teachers' perceived efficacy, student engagement or employment-relevant learning outcomes. Comparative studies across provinces could also identify whether regions with stronger industry-education networks achieve more meaningful AI integration than regions where digital transformation is led mainly by platform procurement.

5. Conclusions

The central problem of AI-enabled vocational education is not whether teachers remain necessary. They do. The more precise problem is what kind of teacher capacity is needed when occupational knowledge, digital tools and school-enterprise collaboration are all changing at once. This study argues that the answer is capacity reconstruction. Vocational teachers in Liaoning and similar industrial regions need to become curriculum translators, AI-supported learning designers, validators of technical and pedagogical quality, brokers of school-enterprise knowledge and stewards of ethical digital practice.

Liaoning's policy environment provides several foundations for this reconstruction: digital vocational education, modern apprenticeship, school-enterprise training bases, industry-education communities, professional capability maps and digital-intelligence literacy initiatives. These foundations should be linked into a coherent teacher development system. The practical priority is to move from tool-centred training to professional-group curriculum renewal; from symbolic enterprise participation to joint validation of learning resources; from platform use statistics to evidence of authentic learning; and from informal AI experimentation to ethical governance.

AI can support vocational education when it extends teachers' capacity to design, diagnose and personalise learning. It weakens vocational education when it is used as a shortcut around professional judgement. The future role of vocational teachers is therefore not smaller but more relational and more accountable. Teachers must work across the borders of classroom, enterprise and platform. For college leaders and policymakers, the task is to make that work visible, supported and institutionally valued.

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