Exploring Informatization Instructional Core Competence of Higher Vocational College Teacher for Professional Development

Si Xu1,2
Pengfei Chen1*
Ge Zhang1,3

1Chinese International College,
Dhurakij Pundit University,
Bangkok,
Thailand

2College of Commerce and Humanities,
Jiangsu College of Safety Technology,
Xu Zhou,
China

3College of Education,
Binzhou Polytechnic,
Bing Zhou,
China

*Corresponding Author

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Abstract

In the dynamic landscape of educational information technology, the proficiency of vocational college teachers in this domain has garnered significant attention due to its rapid evolution. The purpose of this study is to comprehensively explore the foundational aspects of vocational college teachers’ competence in information technology instruction. The primary objective is to augment these teachers’ capabilities and foster their professional growth in the realm of information technology teaching. The six pivotal elements rooted in TPACK (Technological Pedagogical Content Knowledge) are analysed using a literature-based approach. These elements encompass technological knowledge, content knowledge, pedagogical knowledge, technological pedagogical knowledge, pedagogical content knowledge, and technological pedagogical content knowledge. The findings illustrate the distinctive contribution of each element to the information technology teaching competence of vocational college teachers, thereby facilitating their holistic professional development. The nuanced enhancement of these competency indicators equips teachers to adeptly navigate the demands of information technology instruction, cultivates their professional prowess, and enables them to deliver the highest-quality educational services.

Keywords: Higher Vocational College Teachers, TPACK, Informatization Instructional Competence, Professional development
1. Introduction

In the evolving landscape of information technology, informationized education has emerged as a crucial catalyst for the extensive reform of teaching methods and curriculum content. Departing from the conventional instructional approaches, the integration of information technology and blended learning has proven to ignite learners' interest, foster their ability to innovate, and cultivate their exploratory awareness (Zeng & Tan, 2022). The transformative impact of COVID-19 has driven advances in education and technology, causing all stakeholders to transition from traditional to online education. This shift includes the essential training of students and educators in the capacity, knowledge, skills and abilities pertinent to information education (Babieva et al., 2022).

The overarching trajectory of future global education leans toward globalisation and digitisation, as existing educational models fail to meet the market's demand for talent. Precision in education entails the integration of digital platforms, and the strategic application of artificial intelligence is essential for the expansion of educational technology (Mertanen et al., 2022). Traditional teaching methods are undergoing a paradigm shift due to the disruptive influence of innovative information and digital technologies, prompting a re-evaluation from subject to object, as the centre stage in educational research is now occupied by information and communication technology. Inna et al. (2022) constructed a teaching model that was seamlessly aligned with modern education based on the interplay between classical and innovative teaching methods at both theoretical and practical levels.

Information education is a multidisciplinary field populated by sociology, education, anthropology, information technology, psychology, and more. Its intricate nature underscores the importance of core journals in providing a cohesive platform for researchers (Hernández-Torrano & Ibrayeva, 2020). This paper is based on a literary exploration of the impact of information technology on education, beginning with an in-depth examination of the theory of Technological Pedagogical Content Knowledge (TRACK). The related literature will also be thoroughly reviewed to identify the components of higher vocational college teachers' informationized instructional competence.

Information technology made its way into the educational realm in the 21st century, but it was in the 20th century that Lee Shulman proposed the concept of pedagogical content knowledge by ingeniously intertwining pedagogical knowledge with content knowledge. Refusing to accept that these two elements were mutually exclusive, Shulman (1986) produced a framework of the essential knowledge required to teach each subject. This framework highlighted the significance of teachers' ability to fuse subject content knowledge and pedagogical knowledge in their teaching. Pedagogical content knowledge refers to teachers' understanding of students' comprehension and cognition. This is the art of applying subject content knowledge and pedagogical knowledge to their teaching practice, so that students can better grasp and utilise disciplinary knowledge (Nind, 2020). The introduction of pedagogical content knowledge considerably influenced both educational research and practice by directing teachers to place greater emphasis on teaching methods and strategies, which ultimately enhances students' learning outcomes (Gess-Newsome et al., 2019). However, this 20th century framework could not have foreseen the inclusion of technological knowledge in the educational landscape, which is increasingly vital in this 21st century (Muschaweck, 2023).

Therefore, Mishra and Koehler (2006) presented the conceptual framework of TPACK, which is an acronym for Technological Pedagogical Content Knowledge. The knowledge and skills teachers need to proficiently integrate technology into their teaching practice are defined in this framework. Hence, it assists educators to seamlessly infuse technology into their teaching methods based on a combination of technological, pedagogical and content knowledge (Le & Pham, 2023). TPACK encompasses the technological knowledge teachers need to master, the pedagogical knowledge of how to integrate technology into teaching, and the content knowledge of applying technology to support the instructional content (Santos & Castro, 2021).

As illustrated in Figure 1, TPACK represents the "integration of technological pedagogical content knowledge". It consists of three primary domains: Technological Knowledge (TK),
Pedagogical Knowledge (PK) and Content Knowledge (CK), and three sub-domains: Pedagogical Content Knowledge (PCK), Technological Pedagogical Knowledge (TPK), and Technological Content Knowledge (TCK). Ultimately, this configuration constitutes TPACK (Koehler & Mishra, 2009).

TPACK redefines teachers’ knowledge structure and role positioning (Mishra & Koehler, 2006). Their knowledge structure must shift from knowledge of pedagogical content to knowledge of technological pedagogical content (Marcelo & Yot-Dominguez, 2019). Teachers’ decision-making ability, planning ability and pedagogical knowledge are intricately built upon a solid foundation of professional expertise, which forms the cornerstone of their knowledge and lays the groundwork for fundamental classroom requirements (Ning et al., 2022). In this context, TPACK is utilised in this study as a robust theoretical foundation to systematically analyse and discuss the evolution of the informationized instructional competence of higher vocational college teachers based on the components of TK, CK, PK, TCK, PCK, and TPK in the comprehensive framework of TPACK.

![Figure 1: The TPACK Model and its Knowledge Components](image)

2. Methodology

The research method employed in this article involves utilizing online data through a literature-based approach. To ensure the suitability of the data for the research topic, a fuzzy search was conducted using the subject term "Higher Vocational College Teachers Informatization Instructional Competence." The literature type was specified as articles and policy documents, and the language was English. After environmental screening, a total of 4 policy documents and 6 effective articles were obtained. The 4 policy documents include those from the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2011), the International Society for Technology in Education (Whiting, 2017), the European Union Science Hub (EU Science Hub, 2017), and the Education and Training Foundation in the United Kingdom (Education and Training Foundation, 2019). Researchers discussed evaluation indicators for information technology teaching, informatization competence, and informatization instructional competence using different research methods. Among the 6 articles, the researchers proposed grading evaluation indicators for the informatization instructional competence of higher vocational college teachers. These indicators include teaching resource libraries, integration of information technology with subject curriculum (Li & Yuan, 2021), information processing and utilization abilities (Santos et al., 2021), information cognition and demand awareness (Xu, 2020), information technology competencies related to teaching methods,
computer operation abilities in teaching, design and construction of basic information resources, development of professional knowledge through software use, development and management of information technology, and organization and management of online course information technology (Chi et al., 2020), basic professional foundation for informatization teaching, design abilities for informatization teaching, implementation and monitoring abilities for informatization teaching (Liu, 2020), integration and application abilities of informatization teaching, and basic skills for informatization teaching (Zeng & Tan, 2022).

3. Competency Indicators

3.1 Technological knowledge competency indicators

In the dual context of the information age and the post-pandemic era, the use of blended learning in school education has rapidly increased with a greater number of vocational college teachers now utilising information technology in their classroom teaching (Yao & Yang, 2022). Although the use of technology can potentially enhance the quality of teaching, its mere use does not guarantee to do so. Vocational college teachers also need to possess specific professional knowledge and the ability to effectively use digital technology (Kotzebue, 2022). Therefore, it is crucial for vocational college teachers to develop their technological knowledge competence to meet the demands of informatized education, optimise the allocation of teaching resources, and promote teaching innovation and improvement (Gao et al., 2018).

Technological knowledge competence indicators include standards-based classrooms, basic tools, and advanced tools proposed by UNESCO's teacher information and communications technology (ICT) competency framework (UNESCO, 2011), technology empowerment of the International Society for Technology in Education (ISTE) standards for educators (Whiting, 2017), teaching resources from the European framework for educators digital competence (EU Science Hub, 2017), and self-development from the UK's digital teaching framework (Education and Training Foundation, 2019). In related studies, technological knowledge competence indicators are linked to information technology (Zins et al., 2007), AR technology (Chang & Smith, 2008), digitization (Ghavifekr et al., 2016), online teaching (Bostroem et al., 2021), instructional resource repositories (Li & Yuan, 2021), and the ability to design and construct basic information resources, as well as develop and manage information technology (Chi et al., 2020).

Competence indicators with similar meanings can be summarised and classified to enhance clarity and operability, and reduce the number of redundant indicators (Tieppo et al., 2022). For instance, information technology, AR technology, standards-based classrooms, basic tools, complex tools and technology empowerment can be collectively categorised under tool usage (Aljawarneh, 2020). Digitization, digital resources, instructional resource repositories, and the ability to design and construct basic information resources can be grouped under information resources (Miranda et al., 2021), and online teaching, the development and management of information technology, and self-development can be classified as technological development and debugging (Matveeva et al., 2020). Therefore, technological knowledge competence indicators encompass three aspects: tool usage, information resources, and technological development and debugging.

3.2 Content knowledge competency indicators

Based on the current educational model of vocational colleges, classroom teaching relies on lectures and delivering oral information from the lectern to impart the course content to students. This is deemed to be a closed teaching methodology that lacks innovation and appeal, and it is tedious due to confining the instructional content to the textbook. As a result, students find it challenging to receive the knowledge that is being imparted to them, leading to a standard of teaching that is less than ideal (Wahyuni et al., 2021). In actual classroom teaching, teachers find it challenging to address
students’ imbalanced foundational knowledge. Students with robust foundations become bored with classroom teaching, which they perceive as failing to meet their learning needs, while those with weaker foundations are challenged to comprehend the teaching content, causing them to resist and only acquire a surface understanding of the application of information technology (Zhang et al., 2022). While current educators understand the concept of computational thinking and information technology skills, it is still challenging for them to integrate these concepts into their teaching practices and the curriculum. Hence, it is essential to enhance teachers’ competence to deliver content knowledge to students based on the application of information technology (Mujallid, 2021).

There are several content knowledge competence indicators, including teachers’ understanding, mastery and application of the subject content, as well as their knowledge of the learning objectives, teaching strategies, and students’ thinking (Marcelo & Yot-Domínguez, 2019). These indicators are focused on teachers’ ability to effectively impart the subject knowledge and enable students to acquire an in-depth understanding during the teaching process (Nuangchalerm, 2020). Content knowledge competence requires teachers to have a comprehensive grasp of the core concepts and key points of the subject matter, which, in turn, enables them to design teaching strategies that are aligned with students’ thinking styles and learning needs (Leijen et al., 2022).

Technological knowledge competence indicators include the foundational knowledge proposed by the UNESCO teachers’ ICT competency framework (UNESCO, 2011), and instructional planning from the UK’s framework of digital teaching (Education and Training Foundation, 2019). Technological knowledge competence indicators are linked to software development expertise (Chi et al., 2020), which is the foundation of informationized teaching (Liu, 2020). Foundational knowledge and the foundation of informationized teaching can be categorised as the application of content knowledge (Lytvyn et al., 2020), while instructional planning and software development expertise can be classified under the planning and development of content knowledge (Tanak, 2018). In summary, content knowledge competence indicators encompass two aspects of content knowledge, namely its application and its planning and development.

3.3 Pedagogical knowledge competency indicators

Having analysed first-year teacher education students’ comprehensive technology lesson plans, Valtonen et al. (2020) suggested that instructional knowledge plays the most crucial role in developing pre-service teachers’ digital teaching competence (Seufert et al., 2021). This notion underscores the significance of instructional knowledge in the TPACK framework. Instructional knowledge competence indicators can comprehensively reflect teachers’ teaching competence and level beyond the mere application and operation of technology (Bond et al., 2020). In digital teaching, teachers need to master the flexible use of various technological tools, integrating them with instructional content to enhance students’ learning outcomes (Pinto & Leite, 2020). However, solely relying on technological competence and ignoring the absence of sufficient instructional knowledge may lead to issues such as the improper use of technology and suboptimal teaching (Taghizadeh & Hasani Yourdshahi, 2020). Therefore, competence indicators should promote the holistic development of teachers’ digital teaching competence by including both technological and instructional knowledge. Additionally, these indicators should be tailored for different subjects and levels of teachers to more precisely enhance their capabilities and proficiency, providing effective guidance and support for their professional development (Basantes-Andrade et al., 2022).

Technological knowledge competence indicators encompass self-management, as proposed by the UNESCO teachers’ ICT competency framework (UNESCO, 2011), professional growth from the ISTE standards for educators (Whiting, 2017), teaching and learning based on the European framework for the digital competence of educators (EU Science Hub, 2017), and teaching methods from the UK’s digital teaching framework (Education and Training Foundation, 2019). These indicators are associated with information technology skills related to teaching methods, the use of computer operation skills in teaching, and of information technology skills in organising and
managing online courses (Chi et al., 2020). Among them, self-management, teaching and learning, teaching methods, and information technology skills related to teaching methods can be classified under classroom teaching, together with the use of computer operation skills in teaching, and of information technology skills in organising and managing online courses. In summary, classroom teaching and professional growth are both indicators of instructional knowledge competence.

3.4 Technological content knowledge competency indicators

The level of teachers’ technological content knowledge has a direct influence on their performance of digital teaching. Teachers with higher levels of technological content knowledge can effectively integrate technology with the subject content to provide a better quality of teaching (Zhang et al., 2023).

The UNESCO teachers’ ICT competency framework includes digital literacy, knowledge society skills, ubiquitous education, and model learner (UNESCO, 2011). Digital literacy emphasises that teachers should be able to use digital technology effectively and safely to search, evaluate, integrate and create information. This includes the need of a profound understanding of digital tools and resources, and the ability to seamlessly integrate them into the teaching environment to enhance students’ learning (Cheung et al., 2021). Effective communication, teamwork, innovation and problem-solving skills are indispensable competencies for teachers in the digital era due to the important role they play in societal interaction and collaboration (Haryani et al., 2021). Ubiquitous education is focused on teachers’ ability to integrate digital technology in their teaching to promote inclusivity and accessibility in education. As role models for learners, teachers should continually learn and adapt to new technologies (Himmetoglu et al., 2020). Model learners are not just users of technology, but active learners, who are continually updating their knowledge and skills to keep pace with the ever-evolving educational and technological environment (UNESCO, 2011). Santos et al. (2021) identified information processing and technological knowledge-related utilisation skills as indicators of teachers’ competence. Additionally, Xu (2020) emphasised the need for teachers to possess information cognition and demand awareness.

Consequently, digital literacy, ubiquitous education, information processing and utilisation skills can be categorised under the competence of information technology processing and application. Knowledge society skills, model learner, information cognition and demand awareness can be classified under the competence of information technology serving societal needs. Therefore, technological content knowledge competence indicators encompass two aspects: the processing and application of information technology, and information technology serving societal needs.

3.5 Pedagogical content knowledge competency indicators

If the indicators of information technology teaching competence over-emphasise the application of information technology, it may deviate from the essential goal of promoting students’ learning and development (Dewi et al., 2021). Content knowledge is crucial for teachers’ performance of digital teaching (Wang et al., 2019). It encompasses teachers’ understanding of the knowledge of the subject, learning objectives, teaching strategies, and students’ thinking. If teachers have a high level of content knowledge, they can better grasp the core concepts and difficulties of the subject matter, and design appropriate teaching strategies to promote students’ deep understanding and learning outcomes (Njiku et al., 2020). In the context of Pedagogical Content Knowledge (PCK), competence indicators should include the effectiveness of teachers’ use of technology to support the delivery, demonstration and assessment of teaching content to enhance students' learning (Wang et al., 2019). Hence, competence indicators should include a comprehensive consideration of teachers’ ability to apply technology and levels of content knowledge in order to truly achieve the goals of digital teaching, and enhance students’ learning abilities and career development (Dewi et al., 2021).
Indicators of technological knowledge competence include knowledge application, as proposed in the teachers’ ICT competency framework of UNESCO (UNESCO, 2011), personalisation from the ISTE standards for educators (Whiting, 2017), and evaluation from the European framework for the digital competence of educators (EU Science Hub, 2017). Elements of these indicators are information literacy (Hatlevik et al., 2018), information technology teaching design competence (Liu, 2020), and the fundamentals of information technology teaching (Zeng & Tan, 2022). Information literacy, knowledge application, and the fundamentals of information technology teaching can be summarised as the application of pedagogical knowledge, while personalisation and information technology teaching design can be summarised as the application of teaching methods. Hence, the application of pedagogical knowledge, application of teaching methods, and application of teaching evaluation are indicators of pedagogical content knowledge competence.

3.6 Technological pedagogical knowledge competency indicators

In digitized teaching, educators are required to be familiar with the basic functions and operational methods of various technological tools. They should create diverse learning environments that can stimulate students’ interest and motivation, enabling them to flexibly apply these tools to support classroom teaching (Castro & Tumibay, 2021). At the same time, teachers must address challenges such as technical malfunctions, network connectivity issues, and data security to ensure a smooth teaching process (Zhu et al., 2023). Therefore, competence indicators should cover teachers’ understanding of common technological tools and resources, and their proficient use of them. They should also encompass teachers’ ability to seamlessly integrate technology with teaching objectives and content (Liu, 2020). Additionally, teachers’ ability to design teaching strategies and address technology-related issues should also be integral components of competence development (Zeng & Tan, 2022). Utilising indicators of technological pedagogical knowledge enables educators to identify specific areas for improvement, allowing them to enhance their teaching practices and adapt to evolving educational demands and challenges. Continually improving their technological pedagogical knowledge equips teachers to effectively employ technological tools and resources (Tseng et al., 2022).

Technological knowledge competency indicators encompass those proposed by the teacher ICT competency framework of UNESCO, which include technology integration and solving complex problems (UNESCO, 2011), and the European framework of teachers’ digital competence involves indicators related to professional development and empowering learners (EU Science Hub, 2017). Competency indicators in related research include educational reform (Cercone, 2008), integration of information technology (Xie et al., 2020), sustainable development (Adedoyin & Soykan, 2020), integration of information technology with the subject curriculum (Li & Yuan, 2021), ability to implement and monitor ICT in teaching (Liu, 2020), and the ability to integrate and apply ICT in teaching (Zeng & Tan, 2022).

Specifically, teachers’ competencies such as the integration of information technology, technology integration, integration of information technology with the subject curriculum, and the ability to integrate and apply ICT in teaching can be categorised under the broader theme of integration of technology and teaching (Abedi, 2023). Solving complex problems and empowering learners can be classified under the theme of fusion of teaching experience (Liu et al., 2023). Educational reform, sustainable development, professional development, and the ability to implement and monitor ICT in teaching fall under the theme of comprehensive teaching development (Ferede et al., 2022). In summary, technological pedagogical knowledge competency indicators comprise three main aspects: integration of technology and teaching, fusion of teaching experience, and comprehensive teaching development.
4. Discussion

The indicators of vocational college teachers’ information technology teaching competence are based on the six components of the TPACK framework (Mishra & Koehler, 2006). Teachers continuously develop and enhance their understanding and application of technological tools, their ability to integrate their pedagogy with information technology, and their ability to integrate the subject matter and information technology across these six components for their professional growth. Teachers’ ability to combine technology, pedagogy, and subject matter is crucial to achieve the goals of information technology teaching (Absari et al., 2020; Fuad et al., 2020; Mardiana, 2020; Stein et al., 2020). The development of competence indicators based on TPACK is illustrated in Figure 2.

![Diagram illustrating TPACK framework](image)

**Figure 2:** Informatizaon instructional core competence of higher vocational college teacher

At the technological knowledge level, the "Tool Usage" indicator is focused on how vocational college teachers can proficiently and effectively utilise various information technology tools, including basic office software, online educational platforms, multimedia tools, etc. (Grájeda et al., 2024). Cultivating the ability to use these tools contributes to improving teaching efficiency by enabling vocational college teachers to better adapt to the information technology teaching environment. The "Information Resources" indicator emphasises that vocational college teachers need to acquire, evaluate and integrate information resources such as academic articles, digital libraries, online textbooks, etc., to support their teaching activities (Li et al., 2021). Developing this capability helps to enhance vocational college teachers’ awareness of the latest teaching resources and enables them to seamlessly incorporate them into their teaching design to produce a more comprehensive and enriching educational experience. The "Technical Development and Debugging" indicator is related to how vocational college teachers understand, develop, and address issues associated with information technology, including the development of customised teaching applications, solving of technical glitches in teaching, debugging teaching software, etc. Cultivating this capability enables vocational college teachers to better adapt to the continual evolution of technology and flexibly address any potential challenges involved in information technology teaching (Chan, 2023).

At the content knowledge level, "Application of Content Knowledge" emphasises how
vocational college teachers can effectively apply the core concepts and knowledge of their subject area in information technology teaching (Jr & Dagansan, 2023). They need to integrate subject knowledge with technology and design teaching content that is both in-depth and extensive in order to better meet students’ learning needs. By cultivating the ability to apply content knowledge, vocational college teachers can more flexibly use information technology to support subject teaching and enhance teaching quality. The “Content Knowledge Planning and Development” indicator means that vocational college teachers need to plan and develop teaching resources and materials related to the subject content, including digital textbooks, online resources and digital learning resources, and integrate information technology applications in planning the course. Cultivating the ability to plan and develop content knowledge enables vocational college teachers to systematically integrate information technology with subject knowledge, thereby providing more innovative and effective approaches to information technology teaching (Timotheou et al., 2023).

At the instructional knowledge level, “Classroom Teaching” is focused on the practical operation and teaching methods of vocational college teachers in information technology teaching (Liu et al., 2022). This involves teachers’ clever integration of technology tools, digital resources, and interactive methods online to promote students’ engagement and deep learning. Teachers need to design innovative teaching activities, use multimedia materials, and flexibly employ collaborative tools online to enhance classroom interactivity and learning outcomes. "Professional Growth" emphasises the continuous learning and progress of vocational college teachers in the information technology teaching field. This includes remaining informed about the latest technology trends, participating in professional development activities, engaging in community learning, and continually improving their information technology teaching based on reflection and adjustment (Ajani & Govender, 2023).

At the level of knowledge of technological content, "Information Technology Processing and Application" involves vocational college teachers’ effective handling and application of various information technology tools (Linsen, 2021). Developing this capability requires teachers to have a profound understanding of digital tools and resources, enabling them to seamlessly integrate these technologies into the teaching environment to facilitate students’ learning. Teachers need to be familiar with educational technologies and their proficient use, including, but not limited to, multimedia presentations, online collaboration tools, and learning management systems. The "Information Technology Serving Societal Needs" indicator emphasises the way vocational college teachers integrate information technology to meet societal demands. Teachers should understand society’s need for information technology and organically incorporate it into their teaching to promote inclusivity and equal access to education (Montelongo & Eaton, 2019). Additionally, collaboration with industry partners ensures that the instructional content is aligned with actual societal needs and is capable of fostering students’ skills to meet the demands of society.

At the level of teaching content knowledge, the "Application of Pedagogical Knowledge" is related to the ability of vocational college teachers to integrate advanced information technology with the subject knowledge to create a learning experience that is both deep and comprehensive. To develop this ability, teachers need to continually update their subject-area expertise, combining innovative teaching methods with technological tools (Asad et al., 2021). "Application of Teaching Methods" requires vocational college teachers to understand and master different teaching strategies and methods, including online collaboration, distance learning, project-based learning, and others (Mironova, 2022). They must flexibly choose and adjust appropriate teaching methods based on the subject and students’ needs. To be competent in the “Application of Teaching Evaluation”, vocational college teachers need to understand and utilise various digital tools and platforms to comprehensively assess students’ academic performance in a timely manner (Kokaj et al., 2023).

At the level of technological pedagogical knowledge, "Integration of Technology and Teaching" emphasises that vocational college teachers should not only master various technological tools and resources, but also know how to integrate them with the subject content and teaching objectives. This will create more in-depth and innovative teaching approaches that better address the needs of students in the information age, and enhance the attractiveness and effectiveness of the teaching
(Basilotta-Gómez-Pablos et al., 2022). "Fusion of Teaching Experience" underscores vocational college teachers’ ability to introduce diverse technological tools into their teaching, such as virtual reality, online collaboration platforms, etc., that can enhance students’ understanding and interest in the subject (Oliveira et al., 2019). This requires them to actively explore innovative teaching methods that enable students to comprehensively experience support from the application of technology in the learning process. The "Comprehensive Teaching Development" indicator is focused on the comprehensive development of vocational college teachers in areas that include curriculum design, updating of subject knowledge, and student assessment. Comprehensive teaching development has the goal of equipping vocational college teachers with a well-rounded competence in informatization teaching, enabling them to adapt flexibly to technological changes, while better meeting the needs of the subject they are teaching (Ma, 2023).

5. Conclusions, Limitations, and Recommendations

5.1 Conclusion

The informationized teaching capabilities of vocational college teachers include the elements of technological knowledge, content knowledge, pedagogical knowledge, technological pedagogical knowledge, pedagogical content knowledge, and technological instructional knowledge. Different competency indicators play a unique role in enhancing the informatization teaching capability of vocational college teachers for their professional development.

Firstly, in terms of technological knowledge, the indicators of tool usage, information resources, technological development and debugging provide vocational college teachers with comprehensive technological support, which enables them to utilise technological tools proficiently, handle information resources flexibly, develop technology and debug it when necessary. Secondly, at the content knowledge level, the indicators of content knowledge application and content knowledge planning and development are focused on vocational college teachers’ understanding, application, and planning of the subject knowledge. These indicators emphasise the ability to more effectively impart the subject knowledge in an informatization environment. Thirdly, at the pedagogical knowledge level, the indicators of classroom teaching and professional growth emphasise the comprehensive improvement of vocational college teachers’ teaching skills and professional competence, which enables them to better adapt to the demands of informatization teaching in a constantly changing educational environment. Fourthly, in terms of technological pedagogical knowledge, the indicators of processing and applying technology to meet societal needs refers to how vocational college teachers integrate technology with the subject content in a way that meets the needs of society, which provides them with richer tools and resources for their informatization teaching. Fifthly, at the pedagogical content knowledge level, competence in the application of pedagogical knowledge and teaching methods, together with the ability to evaluate their teaching, emphasises vocational college teachers’ comprehensive commitment to the teaching process. This includes their commitment to the flexible application of teaching objectives, the design of diverse teaching methods, and the utilisation of comprehensive teaching evaluation strategies, all of which contribute to improving the effectiveness of informatization teaching. Lastly, at the technological instructional knowledge level, vocational college teachers are committed to integrating technology with their teaching for a blended teaching experience, and to constantly developing their teaching capabilities in order to create a rich teaching experience for themselves and a rich informatization learning environment for their students.

These competency indicators collectively constitute the comprehensive development of vocational college teachers’ informatization teaching ability across various dimensions, including technology, content and teaching, which enables them to better adapt to the requirements of informatization teaching. In this context, they can provide a higher quality of education and cultivate students with well-rounded abilities by continually enhancing their informatization teaching
proficiency based on systematic training, enriched educational resources, and an ongoing reflection of their teaching practices.

5.2 Limitations and Recommendations

Although this study contained an in-depth exploration of the elements that constitute vocational college teachers’ informatization teaching capability, it still has limitations. Firstly, the research was confined to a literature review; hence, it lacks the support of specific empirical data. Secondly, due to the rapid progression of the field of informatization teaching, some emerging technologies and trends may have been neglected. Finally, as the research was primarily focused on vocational college teachers, the informatization teaching capability of teachers at other levels was excluded from the discussion.

These research limitations could be addressed in future by using more empirical research methods, such as surveys, case analyses and on-site observations, to obtain more specific data support. In addition, the research could be regularly updated to focus on the latest trends in technology and teaching practices in view of the rapid and continuous innovation in the field of informatization teaching. Future research could also be expanded to include teachers of different levels, types and backgrounds in order to facilitate a more comprehensive understanding of the overall development of informatization teaching capability.

References


