ABAC ODI JOURNAL Vision. Action. Outcome

ISSN: 2351-0617 (print), ISSN: 2408-2058 (electronic)

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ABAC ODI JOURNAL Vision. Action. Outcome Vol 14(2) pp. 400-417

https://assumptionjournal.au.edu/index.php/odijournal

Published by the
Organization Development Institute
Graduate School of Business and Advanced Technology Management
Assumption University Thailand

ABAC ODI JOURNAL Vision. Action. Outcome
is indexed by the Thai Citation Index and ASEAN Citation Index

Designing a Professional Development Plan for Junior Teachers at Guangxi Polytechnic of Construction

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Received: 8 May 2026 Revised: 7 June 2026 Accepted: 10 June 2026

Abstract

This research study aims to explore junior teachers' professional development at Guangxi Polytechnic of Construction. The focus is the five transferable skills of critical thinking, problem solving, communication, teamwork, and information management. A mixed methods approach was used in collecting both quantitative (n=123) and qualitative data (n=10). Data will be analyzed using descriptive statistics, reliability analysis, multiple linear regression, and thematic analysis. The quantitative findings show that information management skills have the strongest influence on teaching competence followed by communication and problem solving; while critical thinking and teamwork are more indirectly/ contextually related. Interviews revealed challenges such as excessive administrative work, a lack of mentoring and targeted training, and a lack of clarity in evaluations and promotions for junior teachers. Based on the findings, recommendations were made for a professional development plan incorporating the need for formal mentoring, collaborative teaching communities, digital skills training, reflective practice, and school/business cooperation. It places importance on practical implications for improving junior teachers' competency development and supporting organizational change in vocational colleges.

Keywords: Teaching Competency, Junior Teachers, Professional Development, Vocational Education, Organization Development, Transferable Skills

Introduction

Higher vocational education contributes to economic and industrial development of key industries. In China, with vocational colleges being a primary provider of skilled workforce, these schools are designed to not only deliver relevant technical knowledge but to also nurture graduates capable of responding to evolving industry needs, digital transformation and school-enterprise cooperation. The Implementation Plan for National Vocational Education Reform, which highlights the interests of high-quality vocational education, emphasises a "developing system based on demand, in line with industry-specific training of skills and integration of

school-enterprise collaboration in teacher development" (The State Council of the People's Republic of China, 2019). With the restructurization of industries altering expectations of the labour market, vocational institutions must revisit the curriculum, pedagogy and faculty development system that wraps around these systems to strategise around the new set of competences (Organization for Economic Co-operation and Development [OECD], 2023).

Guangxi Polytechnic of Construction is a vocational college with the mission to cultivate construction industry technical talents. Its academic programs, practical training platforms, and school-enterprise cooperation provide a foundation for applied teaching and industry-based learning (Guangxi Polytechnic of Construction [GXPC], 2023). However, the overall development of an institution depends critically on its teaching staff. Junior teachers who have less than three years of teaching experience are negotiating the transition to becoming an educator. Some come to the college direct from postgraduate study, while others transfer from industry to full-time teaching. While they may possess subject knowledge and practical experience, many teachers may still need systematic support in developing teaching skill, communication and soft skills, reflective practice, digital skills, and teacher professional identity (Ertmer & Ottenbreit-Leftwich, 2010; Ingersoll & Strong, 2011). Recent research has shown that new educators receive structured mentorship and systematic support from their institution during the transition to their new position. According to research by Ben-Amram and Davidovitch (2024), mentors traditionally help beginning educators establish classroom management skills, create lesson plans, evaluate students, develop a professional identity, emotionally adjust, and assimilate into the organization. The result is that professional development for beginning teachers should combine individual effort with systematic mentorship and organizational support.

Teaching competency in this study is defined in terms of junior teachers' ability to design lesson plans and enact instructional strategies, to evaluate learning and assess students' ability to learn, to maintain a positive learning atmosphere in the classroom so as to facilitate classroom learnings, and to select appropriate teaching strategies and materials. This study therefore focuses on five types of transferable skills that may impact on teaching competency: critical thinking skills, problem solving skills, communication skills, teamwork skills, and information management skills. The importance of these competencies in vocational education contexts derives in part from the emphasis on the capacity of these mature, transferrable, and generalizable skills to result in better teaching: critical thinking enhances teachers' judgments based on evidence and reflective teaching; problem solving skills enables teachers' response to ill-structured instructional questions or problems and enhances their decisions in teaching (Jonassen, 2011); communication skills are necessary to classroom interaction (Spitzberg, 2013); teamwork skills make possible collaborative and shared learning, and enhance interdisciplinary teaching Salas et al. (2005); and information management skills are an important feature of the teachers' integration of digital tool, online platforms, and use of information resources in teaching (Bruce, 1997; Redecker, 2017).

Research Objectives

1. To examine the current levels of critical thinking skills, problem-solving skills,

communication skills, teamwork skills, information management skills, and teaching competency among junior teachers at Guangxi Polytechnic of Construction.

2. To analyze the influence of critical thinking skills, problem-solving skills, communication skills, teamwork skills, and information management skills on junior teachers' teaching competency.

3. To explore the challenges and support needs of junior teachers in developing transferable skills and teaching competency.

4. To develop a professional development plan for junior teachers based on the integrated quantitative and qualitative findings.

Research Questions

1. What are the current levels of critical thinking skills, problem-solving skills, communication skills, teamwork skills, information management skills, and teaching competency among junior teachers at Guangxi Polytechnic of Construction?

2. Which transferable skills significantly influence junior teachers' teaching competency?

3. What challenges and support needs do junior teachers encounter in developing transferable skills and teaching competency?

4. What professional development plan can be designed to support junior teachers' competency development based on the integrated quantitative and qualitative findings?

Significance of the Study

Findings provide Guangxi Polytechnic of Construction with a clear picture of the competencies of her junior teachers. For Administrators, it provides a factual basis for designing focused professional development plan that focus on institutional goals and matching industry expectation. Combining both the findings of surveys and interviews produces evidence that supports the development of measurable competency deficits in education systems, as well as actual experiences of junior teachers during their actual early career challenges. On a broader scope, the professional development plan outlined in this study may be used as a prototype for other vocational institutions engaging in similar types of faculty development, retention and responsiveness to the shifting needs of vocational educators. Additionally, this research adds to the Organization Development field by demonstrating how mixed-method institutional analysis can aid with institution's professional development planning.

Literature Review

Numerous academics assert that a teacher's performance and the overall quality of educational delivery is impacted by the teaching competence of a teacher, where teaching competence includes the knowledge, skills, dispositions and attitudes necessary for successfully fulfilling their responsibilities as a teacher (Shulman, 1987; Suto et al., 2021). Darling-Hammond (2006) stated that teaching competence involves knowledge of subject

content, knowledge of how to carry out effective pedagogy and the ability to assist students who are diverse learners. Danielson (2011) indicated that competent teachers are capable of setting rigorous standards for student learning, organizing their classrooms effectively for learning, selecting effective instructional methods, and modifying their teaching to meet the varying needs of students. The issue of competency is especially important for vocational educators, who have a need for more explicit links between the classroom and the real-world training that their students need to obtain jobs in a given industry.

In its relation to junior teachers, teaching competency is not a simple categorical ascription but a process of individuation adaptation. Junior teachers with less than three years of teaching experience have not yet firmly established their teaching identity according to Ingersoll and Strong (2011), and they are still developing the ability to manage classrooms and design instruction, and their professional identity and confidence are often fragile. Early-career teachers need "structured induction support to strengthen their effectiveness as teachers and to enhance their adjustment to the profession" (Ingersoll & Strong, 2011), while Ertmer and Ottenbreit-Leftwich (2010) found that "the effective use of technology by teachers particularly depends upon their beliefs, knowledge, and institutional support."

This study focuses on five transferable skills that may influence junior teachers' teaching competency: critical thinking skills, problem-solving skills, communication skills, teamwork skills, and information management skills. These skills are important because vocational teachers work in complex teaching environments where they must analyze instructional situations, solve classroom problems, communicate with students and colleagues, cooperate with enterprises, and manage digital teaching resources. Critical thinking skills refer to the ability to analyze information, evaluate evidence, question assumptions, and make reasoned judgments (Brookfield, 2012). For junior teachers, critical thinking supports reflective teaching and evidence-based decision-making. It helps teachers examine whether teaching strategies are appropriate for students' learning needs and whether classroom decisions are based on sound reasoning rather than routine practice.

Problem-solving skills refer to ability of individuals to identify and effectively resolve difficult or complex issues (Jonassen, 2011). Junior teachers always encounter a host of novel situations that arise out of differences in ability among students, adjustments to curriculum, difficulties in linking teaching content to industry practice. In light of the practical competency of junior teachers to bring real-life experiences into teaching, problem-solving skills enable teaching.

Communication skills are also important in effective teaching. Spitzberg (2013) defined communication competence as a set of knowledge structures, motivators, and skills that are utilized to communicate appropriately and effectively in certain contexts. Junior teachers' communication skills include classroom explanation, student questioning and responding, feedback delivery, and other communication in the classroom. It's even important in school-enterprise cooperation that vocational teachers communicate with enterprise mentors, explain teaching objectives to them, and assist students in solving problems during processes of practical learning.

Teamwork skills refer to teaching ability to work with others in a civil manner toward

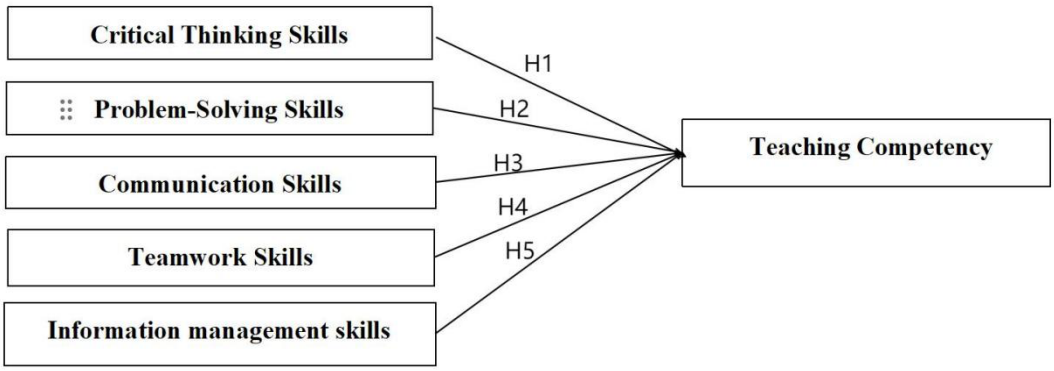
common goals. Salas et al. (2005) researched teamwork performance and described core leadership skills, mutual performance monitoring behavior, backup behavior, teamwork adaptability, and shared mental models, as well. Kozlowski and Ilgen (2006) also emphasized that teamwork is essential to complex and inter-dependent work. In vocational colleges, teaching is usually interlinked with interdisciplinary curriculum design, project based teaching, and school-enterprise cooperation. Therefore, in order to participate in the teaching of a group, it is necessary for a junior teacher to possess some basic skills of teamwork and sharing of resources, develop projects in practice, and learn from teachers who are more senior. Within vocational education and training (VET), teamwork and problem-solving frequently relate, as the coordination needed between teachers, departments, industries, and practical training sites. Trikoili et al. (2024) characterized VET structures as ecosystems based on collaboration and stated that complex educational problems should be solved through collaboration and teamwork. Therefore, helping junior teachers develop their teamwork and collaborative problem-solving skills will help them support authentic teaching, school-industry partnerships, and practice-based curricula.

Information management skills are ability to acquire, evaluate, organize, integrate and apply information (Bruce, 1997; Davenport & Prusak, 1997; Marchionini, 1995). Skills related to information management become even more important in the light of recent advances in technology, smart classrooms, online learning platforms, virtual simulation and even to a certain degree the need to take advantage of artificial intelligence (AI)-assisted teaching. Redecker (2017) demonstrate that educators need digital competence to appropriately select, manage and apply digital resources in teaching process. Recent studies by Diao and Qu (2024) have indicated that competence in technology is essential when it comes to enhancing the professional growth of instructors working in the technical and vocational education and training sector. In this paper, Diao and Qu (2024) present a framework of competencies necessary for providing effective instruction when teaching vocational subjects in an environment supported by digital tools. The findings of their study indicate that instructors within the TVET sector must develop a broad range of competencies in order to be able to successfully meet the demands of the digital transformation.For junior teachers, information management skills support usage of learning materials and teaching resources including online information resources, digital learning platforms, virtual simulations, information and communication technology in classroom teaching.

This research treated teaching competency as the dependent variable, and five of these skills — 1) critical thinking, 2) problem-solving skills, 3) communicating, 4) teamwork skills and 5) information management skills — were measured as independent variables. The goal is to evaluate how these five independent variables explain the variance in teaching competencies of junior teachers, both as indicators of good teachers in terms of having the skills associated with successful teaching and as indicators of which of these skills has greater explanatory power when evaluated in a vocational college setting.

Figure 1

Conceptual Framework of the Study



Note: Developed by the researcher based on the theoretical framework of the study.

Research Hypotheses

Based on the conceptual framework of the study, the following hypotheses were tested:

H1: Critical thinking skills have a significant influence on junior teachers' teaching competency.

H2: Problem-solving skills have a significant influence on junior teachers' teaching competency.

H3: Communication skills have a significant influence on junior teachers' teaching competency.

H4: Teamwork skills have a significant influence on junior teachers' teaching competency.

H5: Information management skills have a significant influence on junior teachers' teaching competency.

Research Methodology

Research Design

An examination of the teaching competency levels of junior teachers at Guangxi Polytechnic of Construction was conducted with a mixed-methods design that featured both quantitative and qualitative components. The quantitative part of the study yielded statistical data indicating whether or not a relationship exists between teaching competency and five different transferable skills, while the qualitative component further clarified the underlying reasons for the observed quantitative trends. The design was appropriate because it provided both measurable results and contextual data (Creswell & Clark, 2018).

A sequential explanatory method was used in this study, meaning that quantitative data were gathered using survey instruments followed by semi-structured interviews administered to a selected group of individuals to assist in the interpretation of the survey findings as well

as the identification of the challenges and support needs of junior teachers. The sequential explanatory method is useful when utilizing qualitative data to help explain and provide additional context for quantitative findings (Ivankova et al., 2006). The two data sets were combined and used as part of a plan for a professionally developed program aimed at improving the skill sets and competencies of junior teachers.

Research Population and Sample

Recent teachers at Guangxi Polytechnic of Construction with three years or less experience were the target population for this research. According to the Human Resources Department, roughly 180 new teachers joined the college between 2022 and 2024 as part of the research project; they consist of recent graduates from master's or doctoral programs in higher education along with those who previously worked within construction-related industries and transitioned into full-time teaching.

Questionnaire Star was used to develop a questionnaire that was sent to eligible teachers via WeChat and QQ; a total of 136 responses were returned. After screening out respondents who did not meet the two-year-or-less experience criteria, there were 123 valid responses and an effective response rate of 90.44%. For the interview portion, purposive sampling for 10 of the valid respondents was conducted based upon their diversity in educational background, department, and previous industrial experience.

Research Instruments

Two instruments were utilized in this research. The first instrument was developed as a structured questionnaire and measured critical thinking, problem-solving, communication, teamwork, information management, and teaching competence. The questionnaire also included baseline and demographic information. All the items used a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

The guided interview and structured questionnaire were assessed for content validity using the Item-Objective Congruence method. Three experts rated the degree of alignment between the Item and the research objectives. Two teaching competence items were eliminated from the original 30 items in the questionnaire because they had an Item-Objective Congruence value less than 0.67. The final questionnaire had 29 items. The final questionnaire was piloted with 30 junior teachers to ascertain whether or not each item was clear and reliable. Cronbach's alpha was employed to determine the reliability of each scale using the variety of items described. (Hair et al., 2009).

The second instrument was a semi-structured interview guide. The questions were developed from a conceptual framework and explored junior teachers' understanding of teaching competence, perceived gaps in teaching competence, challenges experienced in professional development, and recommendations for institutional support.

Data Collection and Analysis

To gather quantitative information, an online questionnaire was used and all required questions marked as compulsory to minimize any missing data. After deleting all invalid

responses, a total of 123 valid responses were included in the analysis. For qualitative data, after the questionnaire was administered, 10 junior teachers participated in semi-structured interviews designed to gain insight into their prior experiences of teaching, barriers they had faced in developing competencies, and their expectations of support/resources.

For the quantitative data, descriptive statistics, reliability, correlation, and multiple linear regression analyses were conducted. The frequency and percentage of respondents' profiles were identified using descriptive statistics, while the level of each variable was summarized via means and standard deviations. Multiple regression analysis was used to establish the relationship between the five transferable skills and teaching competency (Field, 2024). Interviews were analyzed using a thematic analysis framework, where three coders read the transcripts and then discussed their coding results collectively to arrive at a final set of themes (Braun & Clarke, 2006). Ultimately, the quantitative and qualitative results were integrated to formulate the proposed professional development plan.

Results and Discussion

Respondents' Profile

123 valid questionnaire responses were obtained by junior teachers at Guangxi Polytechnic of Construction (GPC). All 123 respondents belonged to one of the eight academic units (e.g. the School of Municipal and Transportation Engineering). 71 of the total respondents were female, and 52 of the total respondents were male. Most respondents were between 25 and 34 years old, indicating that the sample represented early-career teachers who were still in a critical period of professional adaptation. The majority of teachers have achieved their master's degree level of education, followed by the doctoral level and bachelor's level. Most respondents indicated they are entering their current positions directly after having completed their studies at the university level, while the second largest group of respondents consisted of professionals who are currently working in enterprise/industry and are transitioning into academia, and the third was comprised of teachers who previously worked in other schools.

Reliability and Descriptive Findings

The descriptive analysis was conducted to examine the current levels of critical thinking skills, problem-solving skills, communication skills, teamwork skills, information management skills, and teaching competency among junior teachers. Before interpreting the descriptive results, reliability analysis was conducted to ensure the internal consistency of the measurement scales. The reliability and descriptive statistics of the main variables are presented in Table 1.

Table 1

Reliability and Descriptive Statistics of the Main Variables

Variables	Number of Items	Cronbach's Alpha	Mean	SD	Interpretation
Critical thinking skills (CTS)	5	0.878	3.17	0.707	Slightly Disagree
Problem solving skills (PSS)	5	0.865	3.06	0.701	Slightly Disagree
Communication skills (CS)	5	0.891	3.30	0.653	Slightly Disagree
Teamwork skills (TS)	5	0.888	3.34	0.703	Slightly Disagree
Information management skills (IMS)	5	0.887	3.37	0.664	Slightly Disagree
Teaching competency (TC)	4	0.901	3.11	0.762	Slightly Disagree

Note: SD = standard deviation.

The descriptive results indicated that all composite mean scores were interpreted as "Slightly Disagree." This suggests that junior teachers generally reported moderately low levels of self-perceived competency across the five transferable skills and teaching competency. Among the independent variables, information management skills obtained the highest mean score (M = 3.37, SD = 0.664), followed by teamwork skills (M = 3.34, SD = 0.703), communication skills (M = 3.30, SD = 0.653), critical thinking skills (M = 3.17, SD = 0.707), and problem-solving skills (M = 3.06, SD = 0.701). Teaching competency had a mean score of 3.11 (SD = 0.762), suggesting that junior teachers still needed further support in lesson planning, instructional implementation, assessment, classroom environment building, and the selection of appropriate teaching methods and resources.

These findings address research question 1 by revealing that the five transferable skills and teaching competency of junior teachers have not developed significantly as of yet. Although the highest mean score was for information management skills, the overall interpretation remained at "Slightly Disagree." Therefore, while junior teachers may have limited awareness of "digital" tools and "online" resources, their competencies of retrieving, evaluating, organizing, and applying information will need further development. Communication and teamwork also may have relatively positive item level means, but have not yet become consistent "strong" teaching behaviors. Problem-solving has the lowest mean score of the five transferable skills, thus, indicating that the junior teachers will require more support in dealing with the surprises that occur when teaching, developing options to address the surprises, gathering feedback and improving instruction.

Regression Analysis and Hypothesis Testing

Multiple linear regression was conducted to examine the influence of critical thinking skills, problem-solving skills, communication skills, teamwork skills, and information management skills on teaching competency. This analysis addressed the second research question and tested the five hypotheses proposed in the study. The model fit indicates that these

five predictors account for 38.0% of the variance in teaching competency (R = 0.616, R^2 = 0.380 and adjusted R2 = 0.353). This means that the five transferable skills explained a meaningful proportion of junior teachers' teaching competency, although other factors outside the model may also contribute to teaching competency. Table 2 presents the regression results and hypothesis testing.

Table 2

Regression Results and Hypothesis Testing

Independent Variables	Hypothesis	Stand. Estimate (β)	Strength of influence	t	p	Hypothesis Verification Results	VIF	Tolerance
CTS	H1:CTS→TC	-0.12634		-1.5262	0.130	Not supported	1.29	0.774
PSS	H2:PSS→TC	0.19689	3rd	2.4894	0.014	supported	1.18	0.847
CS	H3:CS→TC	0.36384	2nd	4.3705	<0.001	supported	1.31	0.765
TS	H4:TS→TC	0.00625		0.0767	0.939	Not supported	1.25	0.799
IMS	H5:IMS→TC	0.41738	1st	5.2987	<0.001	supported	1.17	0.854

Note: β = standardized regression coefficient; VIF = variance inflation factor.

Based on the results illustrated in Table 2, there were three supported hypotheses. There was a strong positive effect of information management skills on teaching competency (β = 0.417, $p < 0.001$) verifying H5. Communication skills had a significant positive effect on teaching competency (β = 0.364, $p < 0.001$) verifying H3 and problem-solving skills also had a significant positive effect on teaching competency (β = 0.197, p = 0.014) verifying H2. This suggests that junior teachers who possessed stronger information management, communication and problem-solving skills are more likely to report higher levels of teaching competency.

The most significant predictor of teaching competency was information management skills. This is an important result when considering that teaching at a construction-related vocational college increasingly requires the utilization of online resources, smart classrooms, virtual simulations, digital platforms, and current industry information. Junior teachers who possess the skills to retrieve, evaluate, organize and apply digital information capability will be better able to design learning experiences, assist students in their learning, and connect what they teach in the classroom to the world of work. For this reason, skills in information management should be viewed as a key area of developmental priority for junior teachers.

The second strongest predictor was the ability to communicate. This is indicative that there is not only a need for the provision of knowledge in an instructional setting but also for the appropriate delivery of information and understanding of educational goals clearly to students. Moreover, the ability to listen to students, provide timely feedback, and adjust communication to different learning scenarios is required in developing teaching competency. In vocational education, the ability to communicate expands to the context of the classroom and beyond. Junior teachers are required to communicate with colleagues, workplace mentors,

and students in a practical learning environment; therefore, communication skills are critical to managing the classroom effectively, developing student engagement, coordinating professional responsibilities, and enhancing school-enterprise partnerships.

Although problem-solving skills were also statistically significant, they had a less profound effect compared to both the skills of information management and communication, suggesting that the ability of junior teachers to identify instructional problems, explore solutions, address challenges in the classroom, and make improvements in teaching strategies is contributing to their teaching competency. In vocational education, problem-solving skills are critically important because teachers must be able to convert real-world problems in industry into case studies to assist students in completing practical experiential learning tasks.

There were two hypotheses that were not supported. Critical thinking skills did not demonstrate a significant statistical relationship to teaching competency ($\beta = -0.126$, $p = 0.130$) therefore H1 was not supported. This does not necessarily suggest that junior teachers' ability to think critically is unimportant, rather, this may imply that junior teachers have not yet been able to convert their critical thinking skills into observable teaching competency during the early years of their teaching practice. Additionally, teamwork skills did not demonstrate a statistically significant effect on teaching competency ($\beta = 0.006$, $p = 0.939$) therefore H4 was also not supported. This may suggest that junior teachers are working together informally, focusing on sharing resources, rather than exhibiting systematic collaboration in the design of lessons, interdisciplinary teaching, or planned school-enterprise projects.

The multicollinearity diagnostics results for the regression model indicated that the VIF (Variance Inflation Factor) values were between 1.17 and 1.31 and that the tolerance values were from 0.765 to 0.854, which indicates that multicollinearity was not a major concern of the regression model. As a result, the regression parameter estimates were determined to be stable and accurate for inferring the hypothesized relationships of the five transferable skills on teaching competency.

Qualitative Findings

The qualitative findings were used to explain and extend the quantitative results. The interviews explored junior teachers' understanding of teaching competency, the competencies they believed needed improvement, and the support they expected from the institution. The final common themes are summarized in Table 3.

Table 3

Summary of Qualitative Themes

Area	Main Qualitative Themes
Understanding of Teaching Competency	Knowledge transformation and instructional context construction; student-centered and empathy-guided teaching; practice integration and professional value formation
Competencies Needing Improvement	Information management and technology-integration ability; critical thinking and reflective practice; instructional

Area	Main Qualitative Themes
	communication and affective interaction ability
Critical Thinking	Evidence-based and ongoing questioning; multi-angle examination and comparison of solutions; guiding students in critical construction
Problem-Solving	Real projects and problem-based learning; stepwise tasks and peer collaboration; evidence-oriented iteration and optimization
Communication Skills	Structured communication patterns; affective connection and classroom climate building; personalized and adaptive communication
Teamwork Skills	Interdisciplinary project-based collaboration; resource sharing and conflict management; translation of outcomes and professional value-add
Information Management	Digital integration across the entire teaching process; information filtering and compliance management; technical barriers and process optimization
Institutional Support Needs	Precision peer collaboration and hands-on training; interdisciplinary project-based learning community; real-time integrated technical resource support

In qualitative interviews, junior teachers believed that competency in teaching required more than just transferring knowledge. Competency was defined by junior teachers as being able to make transformed knowledge in an understandable form for learning, construct a teaching environment for instruction, relate learning in the classroom to practice, instill professional values within their students, and to foster and support student-centered learning environments or approaches. This is consistent with the vocational education context in that the teacher's role is to assist students in applying the knowledge they gain from training or serious instruction into applicable knowledge integrated into the workplace or fields of industry.

In the interviews, information management was found to be one of the main deficiencies. Lack of critical thinking and ineffective instructional communication were also identified. Participants described barriers related to technology (e.g., fragmented digital tools), mismanagement of digital tools, inefficient means for retrieving information, and excessive volume of information. These themes assist in explaining why lack of information management skills was the most influential predictor in the regression analysis. Although junior teachers indicated that they recognize the value of digital platforms and information resources, they indicated that they require a greater amount of systematic support for digital integration, managing information, and optimizing processes.

The qualitative findings also assisted in explaining the non-significant impact of critical thinking on teaching competency. Although the junior teachers expressed value for the use of evidence-based questioning, multi-dimensional examination, the comparison of solutions, and post-class reviews, these actions have not yet become integrated into their day-to-day teaching practices. This suggests that critical thinking may require more structured mentoring, guided reflection, and repeated teaching practice before it can be transformed into observable teaching competency.

Themes related to problem-solving were consistent with the quantitative findings

regarding the significant impact of problem-solving skills on teaching competency. Junior teachers indicated examples of evidence-based improvement, step-by-step task instruction, collaborative peer interactions, and actual problem-solving opportunities in the classroom. Therefore, the inability of the junior teacher to develop real-world industry-related problems for incorporation or integration into their classroom instruction assistance in increasing the relevance of teaching to students and enhancing the relationship between their teaching in the classroom and vocational practices.

Qualitative communication themes were consistent with the regression results. Participants expressed that structured forms of communication, establishing an affective relationship with their students, creating a classroom environment that facilitates communication, and using adaptive communication are critical for assisting students in understanding complex information related to the professional world, aiding students in overcoming learning difficulties, and creating supportive relationships within the classroom. Therefore, the development of communication skills for junior teachers should be a part of supporting or assisting mentors through peer-to-peer observations and through use of established classroom experiences.

In addition, results regarding teamwork provided a deeper explanation for the insignificant regression relationship. Participants indicated how teamwork contributed to being collaborative in completing cross-disciplinary projects, sharing resources, resolving conflicts within the workplace, and developing their professional competencies. However, the results from the regression analysis indicate that working as a member of a team did not have a direct relationship with teaching competency. This implies that teamwork will only contribute to teaching competency when it is directly related to producing a specific teaching task (i.e., collaboratively designing a lesson plan, participating in peer observation, engaging in multidisciplinary curriculum development activities, and participating in school-enterprise collaborations) in the classroom environments.

Integrated Discussion

An integrated interpretation of the findings indicates that junior teachers develop their teaching competencies through both individual skill improvements and organizational support. The quantitative findings indicated that information management skills, communication skills, and problem solving skills are the three strongest predictors of teaching competency. The qualitative findings described how junior teachers encountered practical difficulties with regard to their use of digital tools for instructional communication, authentic design, mentoring, and collaborative learning.

Information management skills should be emphasized as a priority area for development due to these specific skills having the greatest effect on teaching competency as indicated in the strongest data set, and being most frequently referred to during interviews. In a technology-rich vocational college environment, junior teachers need to strengthen their ability to select digital tools, evaluate online resources, organize information, integrate technology into lesson design, and use data to support teaching decisions. However, digital-skills development should be connected with actual teaching tasks, such as smart classroom

use, online learning platform management, virtual simulation design, and digital assessment.

Communication skills should also be emphasized as they were highly correlated with teaching competency. Junior teachers require support in effectively communicating professional knowledge, assisting students with learning difficulties, providing feedback, and modifying their communication styles to meet student needs. Therefore, communication skill development should be included as part of structured mentoring, peer observation, classroom practice, and training on teacher-learner interaction.

Teachers can develop their problem-solving skills through authentic teaching scenarios and project-based learning. As vocational education is focused on the practical application of knowledge, junior teachers require opportunities to take real-life examples of their industry and apply them into the classroom, develop step-wise activities, collect student feedback for revision of instruction, and to receive input from their instructional teams, mentors from industry, and/or other academic departments regarding their teaching development.

Caution should be exercised when interpreting the non-significant relationship of critical thinking skills and teamwork skills. The results of this research suggest that the application of these two specific skills is likely to have an indirect or contextual relationship with teaching competency as opposed to a direct or immediate effect. Critical thinking is likely to support teaching competency when connected to reflective teaching, evidence-based lesson improvement, and post-class systematic review. Teamwork is likely to support teaching competency when it is converted from informal sharing of resources to more structured collaboration such as lesson study, interdisciplinary curriculum development, and collaboration between schools and enterprises.

In summary, it is evident from this integrated interpretation of the results that future professional development plans should focus on the three strongest, evidence-based areas of development for the junior teacher: information management skills, communication skills, and problem solving skills; and that structured support should also be planned for the development of critical thinking skills and teamwork.This integrated interpretation provides the basis for the professional development recommendations presented in the next section.

Conclusion and Recommendations

Conclusion

This study examined the factors influencing junior teachers' teaching competency at Guangxi Polytechnic of Construction and developed a professional development plan based on integrated quantitative and qualitative findings. The results showed that junior teachers' overall levels of critical thinking skills, problem-solving skills, communication skills, teamwork skills, information management skills, and teaching competency were not yet strongly developed. This indicates that junior teachers still need systematic support during the early stage of their professional adaptation.

The results of the regression analysis indicated that effective use of information management skills, communication skills, and problem-solving skills were significant positive

predictors of teaching competency in junior teachers. Information management skills were found to have the strongest association with teaching competency, followed by communication and problem-solving skills. These results indicate that if junior teachers can utilize information resources effectively, communicate with students and peers effectively, and develop solutions for instructional problems through the implementation of effective practices, then they will be able to improve their competency in teaching.

Critical thinking and teamwork skills did not demonstrate significant direct relationships with teaching competency based on the regression analysis; however, the qualitative data seemed to indicate that critical thinking and teamwork were also important based on context. Critical thinking contributes to reflective teaching practices as well as evidence-based improvements, while teamwork allows for the sharing of resources, collaborative efforts with other disciplines, and professional development. Therefore, critical thinking and collaboration should not be overlooked but rather strengthened through the use of planned mentoring, reflective practices and collaborative teaching.

The qualitative findings further explained the quantitative results by showing that junior teachers faced challenges such as fragmented digital tool use, limited mentoring, insufficient practical feedback, communication difficulties, and limited opportunities for deep school-enterprise collaboration. The integrated findings indicate that junior teachers' professional development requires both individual skill improvement and organizational support. Therefore, the professional development plan should focus on targeted, practical, and sustainable development activities rather than general training alone. (see Table 4).

Table 4

Professional Development Plan for Junior Teachers

Significant Variable	Evidence from Findings	Recommended Actions
Information Management Skills	Information management skills had the strongest influence on teaching competency. Qualitative findings emphasized digital integration, information filtering, technical barriers, and process optimization.	1. Provide systematic training on information and communication technology and instructional platforms. 2. Support the integration of cloud-based tools, multimedia resources, and social applications into course design. 3. Develop a shared digital repository of teaching materials.
Communication Skills	Communication skills significantly influenced teaching competency. Qualitative findings emphasized structured communication, affective connection, classroom climate building, and adaptive communication.	1. Provide training in classroom communication and classroom management. 2. Establish a peer observation and feedback system.

Significant Variable	Evidence from Findings	Recommended Actions
		3. Organize student forums to collect feedback and understand student needs.
Problem-Solving Skills	Problem-solving skills significantly influenced teaching competency. Qualitative findings emphasized real-project-driven teaching, problem-based learning, stepwise tasks, and evidence-oriented improvement.	1. Organize teaching case seminars to analyze real classroom problems. 2. Require reflective teaching journals to turn classroom issues into improvement plans. 3. Encourage participation in teaching enhancement projects or classroom-based research.

The recommended actions in Table 4 emphasize targeted and practical development support. As suggested by this research, developing information management skills through digital-skills training, infrastructure support (e.g., digital tools), and shared teaching materials is most likely to improve teachers' competency. Communication skills can also be supported through classroom-based training in communication, peer-feedback programs, and using student feedback. Finally, problem-solving skills can be enhanced through the use of teaching cases (seminars), the use of reflective journals, and implementing improvement projects in the classroom. Even though critical thinking skills and team-building skills were not strong predictors in the regression model, they can be enhanced through opportunities for guided reflection, participating in collaborative teaching communities, designing interdisciplinary lessons, and through school-business teaching projects.

Implications and Future Research

According to the findings, vocational colleges should think of the development of junior teachers as an organizational process rather than an individual one to be taken care of by teachers themselves. Support for new teachers should include opportunities provided to help new teachers grow through mentoring, learning with peers, access to digital resources, teaching in the classroom, and being encouraged by policy level factors. The model provides a useful starting point for expanding or revising existing methods at Guangxi Polytechnic of Construction, as well as additional reference material that could help improve the overall quality of instruction in junior teachers and ultimately help those individuals become more independent and professional.

Future work could expand upon this research and include additional variables including but not limited to: motivation to teach, ability to regulate one's emotions, skills to design curricula, quality of mentoring, and support from the institution. The current model only accounted for 38% of the variance in teaching competency, indicating that these additional variables may be important in helping to describe a more complete picture.

Future research could also include testing the model in other vocational colleges that focus on science and engineering to see if the research can yield similar results across different institutions.

References

Ben-Amram, M., & Davidovitch, N. (2024). Novice teachers and mentor teachers: From a traditional model to a holistic mentoring model in the postmodern era. *Education Sciences, 14*(2), 143. https://doi.org/10.3390/educsci14020143

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Brookfield, S. D. (2012). *Teaching for critical thinking: Tools and techniques to help students question their assumptions*. Jossey-Bass.

Bruce, C. S. (1997). *The seven faces of information literacy*. Auslib Press.

Creswell, J. W., & Clark, V. L. P. (2018). *Designing and conducting mixed methods research* (3rd ed.). Sage Publications.

Danielson, C. (2011). *Enhancing professional practice: A framework for teaching* (2nd ed.). ASCD.

Darling-Hammond, L. (2006). *The right to learn: A blueprint for creating schools that work*. Jossey-Bass.

Davenport, T. H., & Prusak, L. (1997). I*nformation ecology: Mastering the information and knowledge environment*. Oxford University Press.

Diao, J., & Qu, Y. (2024). Teaching competence of TVET teachers in the digital age: Implementation and evaluation of a training program in China. *Evaluation and Program Planning, 103*, 102402. https://doi.org/10.1016/j.evalprogplan.2024.102402

Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research on Technology in Education*, *42*(3), 255-284. https://doi.org/10.1080/15391523.2010.10782551

Field, A. (2024). *Discovering statistics using IBM SPSS statistics*. Sage publications limited.

Guangxi Polytechnic of Construction. (2023). *Annual quality report of higher vocational education (2023)*. https://www.tech.net.cn/upfiles/zlbg2023_new/xx/guangxi/guangxi%20%2814%29.pdf

Hair, J., Black, W., Babin, B., & Anderson, R. (2009). *Multivariate data analysis*. Prentice Hall. *London*.

Ingersoll, R. M., & Strong, M. (2011). The impact of induction and mentoring programs for beginning teachers: A critical review of the research. *Review of Educational Research*, *81*(2), 201-233. https://doi.org/10.3102/0034654311403323

Ivankova, N. V., Creswell, J. W., & Stick, S. L. (2006). Using mixed-methods sequential explanatory design: From theory to practice. *Field Methods*, *18*(1), 3-20. https://doi.org/10.1177/1525822X05282260

Jonassen, D. H. (2011). *Learning to solve problems: A handbook for designing problem-solving*

learning environments. Routledge.

Kozlowski, S. W. J., & Ilgen, D. R. (2006). Enhancing the effectiveness of work groups and teams. *Psychological Science in the Public Interest*, *7*(3), 77-124. https://doi.org/10.1111/j.1529-1006.2006.00030.x

Marchionini, G. (1995). *Information seeking in electronic environments*. Cambridge University Press. https://doi.org/10.1017/CBO9780511626388

Organisation for Economic Co-operation and Development. (2023). *Building future-ready vocational education and training systems. OECD Publishing*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2023/07/building-future-ready-vocational-education-and-training-systems_3dd46aae/28551a79-en.pdf

Redecker, C. (2017). *European framework for the digital competence of educators: DigCompEdu.* Publications Office of the European Union. https://doi.org/10.2760/159770

Salas, E., Sims, D. E., & Burke, C. S. (2005). Is there a "Big Five" in teamwork?. *Small Group Research*, *36*(5), 555-599. https://doi.org/10.1177/1046496405277134

Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, *57*(1), 1-23. https://doi.org/10.17763/haer.57.1.j463w79r56455411

Spitzberg, B. H. (2013). (Re)Introducing communication competence to the health professions. *Journal of Public Health Research*, *2*(3), 23. https://doi.org/10.4081/jphr.2013.e23

Suto, I., Vitello, S., & Maekawa, Y. (2021). *What is competence? A shared interpretation of competence to support teaching, learning and assessment.* Cambridge University Press & Assessment.

The State Council of the People's Republic of China. (2019, January 24). *Notice on issuing the national vocational education reform implementation plan*. https://www.gov.cn/zhengce/content/2019-02/13/content_5365341.htm

Trikoili, A., Georgiou, D., & Pittich, D. (2024). VET leaders' collaborative problem-solving skills: Insights from a professionals' master's degree program. *Frontiers in Education, 9*, 1483034. https://doi.org/10.3389/feduc.2024.1483034