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Teachers' competence in teaching technology and livelihood education: Implications for instructional management in elementary schools

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ABSTRACT

Technology and Livelihood Education (TLE) prepares elementary learners for practical tasks, problem-solving, and livelihood-related skills. Yet, more evidence is needed on how elementary TLE teachers' competence can guide instructional management. This study investigated teacher competence in ten (10) elementary schools in Quezon City using a descriptive-survey design involving 40 TLE teachers and 10 school heads. The overall competence mean was 3.42 (SD = 0.38). Subject-matter knowledge received the highest rating (M = 3.58, SD = 0.35), followed by pedagogical practices (M = 3.46, SD = 0.39), assessment practices (M = 3.37, SD = 0.42), and instructional resource management (M = 3.27, SD = 0.45). Resource management and performance-based assessment emerged as priority areas for professional development. School heads' instructional management support had a mean of 3.35 (SD = 0.41), with resource provision receiving the lowest rating. Schools should align teacher development, instructional supervision, and resource allocation with identified needs.

Keywords: Teacher competence, Technology and Livelihood Education, instructional management, professional development, elementary education.

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INTRODUCTION

Quality education depends on what schools teach and how well teachers turn curriculum requirements into meaningful learning experiences. This is especially relevant to Technology and Livelihood Education (TLE), where learners are expected to develop practical skills, solve problems, use technology, and understand the value of work. TLE teaching involves more than explaining concepts. Teachers must demonstrate procedures, organize hands-on activities, guide learners' practice, and assess performance. These tasks require subject knowledge and the ability to apply appropriate teaching methods.

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Teacher competence also concerns how schools organize instruction and support teachers' work. School heads influence teaching through instructional supervision, professional development, and decisions about learning resources. Antera (2021), in a review of vocational teachers' professional competence, explained that competence involves knowledge, skills, attitudes, and other attributes associated with professional practice. The review also emphasized the difficulty of defining competence without considering the context in which teachers work. This perspective is relevant to TLE because teachers must combine technical knowledge with the ability to guide practical learning.

International evidence supports the need for sustained teacher development. Darling-Hammond et al. (2017) reviewed 35 methodologically rigorous studies and identified features of effective professional development, including content focus, active learning, collaboration, coaching, feedback, and sustained engagement. Kraft et al. (2018) likewise found positive average effects of teacher coaching on instructional practice and student achievement across 60 causal studies. These findings suggest that professional development is more useful when teachers can apply new knowledge, receive feedback, and refine their teaching practices over time.

Instructional leadership is another relevant consideration. He et al. (2024) examined 304 secondary school teachers and 19 principals in Nigeria and found a significant association between principals' instructional leadership and teachers' professional development. Their findings support the role of school leaders in creating opportunities for professional growth. The OECD (2025), through the Teaching and Learning International Survey (TALIS) 2024, also documented the importance of teachers' working conditions and professional learning in understanding the realities of teaching across education systems.

In the Philippines, TLE forms part of the basic education curriculum and aims to help learners acquire useful knowledge and practical skills. The Department of Education's (DepEd, 2016) curriculum guide for Edukasyong Pantahanan at Pangkabuhayan and TLE for Grades 4–6 guides curriculum content and learning expectations. DepEd Order No. 42, s. 2017, which adopted the Philippine Professional Standards for Teachers (PPST), also established a framework for teacher development, professional growth, and performance support (DepEd, 2017). These policies place teacher competence and continuing professional development within the broader effort to improve the quality of instruction.

Local research has examined the competence of TLE teachers in different educational settings. Guiquing (2024) assessed 22 junior high school TLE teachers from six public schools in Cagayan and reported high teacher competence and teaching performance. Although the study provides useful evidence, its respondents were junior high school teachers. The results cannot automatically be applied to elementary teachers, whose curriculum responsibilities and teaching conditions may differ.

Gumban et al. (2024) investigated the ICT pedagogical competence of TLE teachers in a non-urban public school in the Division of Aklan. Their study examined differences in competence according to teachers' professional characteristics and reported improvements following an enhancement intervention. Dordas and Accad (2025) also examined the pedagogical and technical competence, problems, and competency needs of TLE teachers in Tacurong City. Their work identified the need for professional development that responds to teachers' technical and instructional demands. Galit (2025), in a study involving 170 TLE teachers in Northern Samar, examined the integration of 21st-century skills in teaching practices and considered teachers' profiles and competency needs. These studies provide relevant Philippine evidence, but they cover different locations, grade levels, and competence domains.

Esguerra (2026) further examined TLE teachers' content, practical, instructional, and technical competence in selected public schools in Dasmariñas City, Cavite. The study reinforces the relevance of assessing multiple dimensions of competence when planning professional development. However, the evidence remains tied to its own setting and should not be treated as a direct description of elementary teachers in Quezon City.

The studies reviewed here provide a basis for examining TLE teacher competence, but further local evidence is needed on teachers assigned to Grades 4–6 across several elementary schools and on how the findings can inform instructional management. School administrators need to know which competence areas require support and whether existing practices in supervision, training, and resource provision respond to teachers' needs. Differences in educational preparation, specialization, experience, and access to instructional materials may affect how teachers conduct practical lessons. Without information about these conditions, school-level decisions may not address the difficulties teachers face in the classroom.

The present study examined teachers' competence in teaching TLE in ten selected elementary schools in Quezon City. It focused on subject-matter knowledge, pedagogical practices, assessment practices, and management of instructional resources. It also considered school heads' perspectives on instructional supervision, professional development, and resource provision. Specifically, the study aimed to assess teachers' competence in the identified areas, determine their professional development needs, examine the instructional management support provided by school heads, and propose an instructional management enhancement plan based on the findings.

METHODOLOGY

The study employed a descriptive-survey research design to assess teachers' competence in teaching TLE in Grades 4–6 and determine its implications for instructional management. It was conducted in ten selected elementary schools in Quezon City, Philippines.

The respondent group consisted of 40 TLE teachers assigned to Grades 4–6 and ten (10) school heads, one from each participating school. Total enumeration was used for eligible TLE teachers, while purposive selection was applied to the school heads. The teachers provided information about their professional profiles, subject-matter knowledge, teaching strategies, assessment practices, and management of instructional resources. The school heads provided supplementary information on instructional supervision, teacher development, and resource management.

Data were collected using researcher-developed questionnaires covering teachers' professional profiles and competence in the identified areas. A separate instrument gathered information from school heads about instructional management practices. The instruments were reviewed by experts for content validity, and revisions were made based on their recommendations. The final instruments and reliability procedures were documented before data analysis.

Permission was obtained from the appropriate education authorities and school administrators before data collection. Participation was voluntary, and informed consent was obtained from the respondents. Confidentiality was maintained by limiting identifying information and presenting findings in aggregate form.

Frequency and percentage were used to summarize teachers' professional profiles. Means and standard deviations were used to describe competence ratings and responses concerning instructional management support. The interpretation of the ratings followed the scoring criteria established for the research instrument. Responses concerning professional

development needs were analyzed to identify areas requiring further training, mentoring, or instructional support. The findings from the teacher questionnaires and school-head responses were examined to develop an instructional management enhancement plan.

RESULTS AND DISCUSSION

Teachers' competence in teaching Technology and Livelihood Education

Teachers' competence in teaching TLE was assessed in four areas: subject-matter knowledge, pedagogical practices, assessment practices, and management of instructional resources. The overall mean was 3.42 (SD = 0.38), interpreted as highly competent under the four-point rating scale used. Subject-matter knowledge obtained the highest mean (M = 3.58, SD = 0.35), followed by pedagogical practices (M = 3.46, SD = 0.39), assessment practices (M = 3.37, SD = 0.42), and management of instructional resources (M = 3.27, SD = 0.45).

The higher rating for subject-matter knowledge suggests that teachers had a stronger foundation in the content they taught than in some practical aspects of instruction. Knowledge alone, however, does not ensure effective TLE teaching. Teachers must also demonstrate procedures, organize hands-on activities, assess practical performance, and manage the materials needed for learning. The lower rating for instructional resource management points to an area that may require further support. Schools could review the availability of materials and equipment and help teachers develop strategies for conducting practical activities under different classroom conditions.

Pedagogical practices received a mean of 3.46, while assessment practices received a mean of 3.37. This difference suggests that teachers may benefit from additional support in developing performance tasks, establishing clear assessment criteria, and providing feedback on practical activities. TLE assessment should measure both learners' understanding and their ability to apply skills. Professional development should therefore help teachers align learning outcomes, instructional activities, and assessment methods.

The standard deviations ranged from 0.35 to 0.45 across the four dimensions. Resource management had the highest standard deviation (SD = 0.45), indicating greater variation in responses than in the other areas. This may reflect differences in teachers' experiences, access to materials, or familiarity with resource-management practices. Further analysis would be needed to determine which factors account for these differences.

These findings can be considered alongside Antera's (2021) discussion of professional competence as a context-dependent concept. Teachers may have adequate knowledge but still need support in applying it to practical instruction. For this reason, competence assessment should examine specific teaching responsibilities rather than rely only on general ratings of professional ability.

Professional Development Needs and Instructional Management Practices

Instructional resource management was identified as the leading professional development need (M = 3.61), followed by performance-based assessment (M = 3.54), technology integration (M = 3.48), and innovative teaching strategies (M = 3.39). These ratings suggest that training should address practical classroom needs rather than rely exclusively on general professional development activities.

The findings also point to the need to distinguish between teachers' skill gaps and limitations in the resources available to them. Training may improve teachers' ability to design assessments or integrate technology, but it cannot fully address shortages of equipment and

materials. School administrators should therefore combine professional development with resource planning and instructional support.

The school heads' responses produced an overall mean of 3.35 (SD = 0.41) for instructional management support. Professional development support received a mean of 3.48, instructional supervision 3.42, and resource provision and management 3.15. Resource provision and management received the lowest rating among the three areas, suggesting that the availability and management of instructional resources may require greater administrative attention.

The difference between teachers' resource-management competence (M = 3.27) and school heads' resource-support rating (M = 3.15) was 0.12 points. This numerical difference provides a reason to examine resource management from both the teacher and administrative perspectives. It does not establish a statistically significant difference or prove that school support caused teachers' competence ratings.

The importance of school-level support is consistent with He et al. (2024), who found an association between principals' instructional leadership and teachers' professional development. Darling-Hammond et al. (2017) also emphasized the value of professional learning that includes active participation, coaching, collaboration, and feedback. These studies support the use of targeted development activities accompanied by follow-up assistance.

School heads may strengthen instructional supervision through classroom observation, coaching, and constructive feedback. They may also consult teachers about essential equipment, coordinate the use of available resources, and organize training based on identified competence needs. Such measures can help align school-level decisions with classroom requirements.

Proposed Instructional Management Enhancement Plan

The findings support an instructional management enhancement plan focused on resource management, performance-based assessment, technology integration, and instructional supervision. Proposed activities include workshops on assessment rubrics and performance tasks, demonstrations of resource-efficient teaching strategies, peer mentoring, and scheduled classroom observation with constructive feedback.

School heads may coordinate these activities with TLE teachers. Each activity should have a clear objective, a responsible person, an implementation schedule, and measurable indicators. Teachers' assessment materials may be reviewed to determine whether training improves the quality of performance tasks and rubrics. Classroom observations and follow-up assessments may also help determine whether instructional practices improve.

Resource-related interventions should begin with an inventory of available materials and an assessment of teachers' instructional requirements. Schools may prioritize essential equipment, improve the scheduling and sharing of resources, and identify appropriate alternatives when materials are limited. The plan should also be evaluated after implementation to determine whether it addresses the needs identified in the study.

The findings suggest that improving TLE instruction requires both teacher development and administrative support. Professional development can strengthen teachers' knowledge and skills, while effective instructional management can help create the conditions necessary to apply those skills. A coordinated approach may therefore provide a stronger basis for improving practical teaching and learning.

CONCLUSION

Teachers' competence in TLE involves more than knowledge of subject content. Effective instruction also requires appropriate teaching strategies, assessment practices, and the ability to manage instructional resources. Schools should use evidence from competence assessments to identify teachers' strengths and areas requiring improvement.

School administrators should work closely with teachers to identify professional development needs, provide constructive instructional supervision, and review the availability of materials and equipment. Training should focus on practical assessment, resource management, and teaching strategies that help learners apply what they learn.

An instructional management enhancement plan should be developed from verified findings and implemented with clear responsibilities and evaluation procedures. Follow-up observations and assessments can help determine whether the interventions improve teaching practices. Teachers and school heads must share responsibility for creating conditions that support effective instruction and meaningful practical learning.

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