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THE CHALLENGES OF TEACHING WITH TECHNOLOGY

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Abstract
This study extends previous research by examining how technology integration influences the types of knowledge teachers must consider in their practice. It aims to explore the implementation of technology-related professional knowledge in educational settings. The paper discusses three core components of language teaching with technology: content knowledge, pedagogical knowledge, and technological knowledge, as well as their interactions.

Keywords: challenges, language teaching, technologies, classroom context.

As educators are aware, teaching is a complex practice that requires the integration of multiple forms of specialized knowledge. Thus, teaching can be classified as an ill-structured discipline, requiring teachers to apply complex knowledge structures across different scenarios and contexts. Teachers work in dynamic classroom environments that necessitate constant adaptation and refinement of their understanding. Effective teaching, therefore, relies on flexible access to well-organized, integrated knowledge across various domains [4, p. 93-94; 7, p. 5; 9, p. 14], including student learning processes, subject matter expertise, and, increasingly, technological proficiency.

Teaching with technology is complicated further when the challenges newer technologies present to teachers are considered. In the article, the word *technology* applies equally to analogue and digital, as well as new and old, technologies.

Most traditional pedagogical technologies are characterized by specificity (a pencil is for writing, for instance); stability (pencils and chalkboards have not changed a great over time); and transparency of function (the inner workings of the pencil or a chalk are simple and directly related to their function) [8]. Over time, these technologies have become commonplace and, in most cases, are not even considered to be technologies. Digital technologies – such as computers, handheld devices, and software applications – by contrast, are protean (usable in many different ways [6], unstable and rapidly changing. On an academic level, it is easy to argue that a pencil and a software simulation are both technologies. The latter, however, is qualitatively different in its functioning to teachers and offers fundamentally less stable than more traditional technologies. By their very nature, newer digital technologies, present new challenges to teachers who are struggling to use more technology in their instruction.

Also complicating teaching with technology is an understanding that technologies are neither neutral nor unbiased. Thus, particular technologies have their own propensities, potentials, affordances, and constraints that make them more suitable for certain tasks than others [1; 2]. Using emails to communicate, for example, affords asynchronous communication and easy storage of exchanges. Email does not afford synchronous communication in the way that a phone call, a face-to-face conversation, or instant messaging does. Nor does email afford the conveyance of subtleties of tone, intent, or mood possible with face-to-face communication. Understanding how these affordances and constraints of specific technologies influence what teachers do in their classrooms is not straightforward and may require further teacher professional development.

Social and contextual factors also complicate the relationships between teaching and technology. Social and institutional contexts are often unsupportive of teachers' efforts to integrate technology use into their work. Teachers often have inadequate or inappropriate experience with using digital technologies for teaching and learning. Many teachers earned degrees at a time when educational technology was at a very different stage of development than it is today. Thus, it is not surprising that they do not consider themselves sufficiently prepared to use technology in the classroom and often do not appreciate its value or relevance to teaching and learning. Acquiring a new knowledge base and skill set can be challenging, particularly if it is a time-intensive activity that must fit into a busy schedule. Moreover, this knowledge is unlikely to be used unless teachers can conceive of technology uses that are consistent with their existing pedagogical beliefs [3]. Furthermore, teachers have often been provided with inadequate training for this task. Many approaches to teachers' professional development offer a one-size-fits-all approach to technology integration when, in fact, teachers operate in diverse contexts of teaching and learning.

Given these challenges, how can teachers effectively integrate technology into their teaching? A successful approach must acknowledge that teaching is a dynamic interaction between what teachers know and how they apply this knowledge within the unique circumstances of their classrooms [5]. There is no single

'best method' for incorporating technology into curricula; rather, integration strategies must be creatively tailored to specific subject matter and classroom settings.

Since teaching with technology is a complex and evolving task, educators must develop new frameworks for understanding and managing this complexity. In this regard, three core components play a crucial role in language teaching with technology: content knowledge, pedagogical knowledge, and technological knowledge. The interplay among these components, which varies across different educational contexts, accounts for the wide discrepancies in the effectiveness of technology integration.

Content knowledge refers to a teacher's expertise in the subject matter they teach. The curriculum for middle school language instruction, for instance, differs significantly from that of an undergraduate language course. As Shulman noted, this knowledge includes concepts, theories, ideas, organizational frameworks, evidence, and established methods for developing subject expertise [9].

In the context of language teaching, content knowledge encompasses essential aspects such as curriculum design, assessment strategies, learning conditions, and the interconnections between pedagogy and evaluation. Teachers must have a deep understanding of their subject matter and how best to convey it to students, ensuring that instructional methods align with the core principles of language acquisition.

Pedagogical knowledge involves an educator's expertise in teaching methodologies, instructional strategies, and classroom management techniques. This knowledge extends beyond subject-specific instruction to include general principles of learning, student engagement techniques, lesson planning, and assessment methods.

A teacher with strong pedagogical knowledge understands how students construct knowledge, acquire skills, and develop critical thinking abilities. Furthermore, they recognize the importance of fostering an inclusive, interactive, and adaptive learning environment. Effective teaching, therefore, requires an understanding of cognitive and social learning theories and their application in classroom settings.

Additionally, pedagogical knowledge includes an awareness of common student misconceptions, strategies for building connections between different content areas, and the importance of prior knowledge in shaping new learning experiences.

Unlike content and pedagogical knowledge, which remain relatively stable, *technological knowledge* is constantly evolving. Teachers must not only master their subject matter but also develop a deep understanding of how technology influences and reshapes teaching practices.

Technological knowledge involves selecting the most appropriate digital tools for a given subject area, understanding how these tools affect learning processes, and adapting to continuous advancements in educational technology. For example, the integration of artificial intelligence (AI), adaptive learning platforms, and gamification techniques has transformed language instruction by enabling personalized learning experiences.

Thus, teachers who possess strong technological knowledge are better equipped to leverage technology effectively, fostering engagement and improving learning outcomes.

To overcome the challenges of technology integration, educational institutions and policymakers must implement proactive measures that support teachers in developing technological competence. Some key strategies include:

1. Bridging the Access Gap: Ensuring that all educators have access to up-to-date technological resources and digital training programs.

2. Promoting Mindful Technology Use: Encouraging teachers to adopt technologies that enhance, rather than replace, pedagogical best practices.

3. Providing Professional Development: Offering tailored training sessions that address the specific needs of educators across different disciplines.

4. Investing in Robust Technological Infrastructure: Allocating resources to overcome the challenges of technology integration, educational institutions and policymakers must implement proactive measures that support teachers in developing technological competence. Some key strategies include:

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3. Providing Professional Development: Offering tailored training sessions that address the specific needs of educators across different disciplines.

4. Investing in Robust Technological Infrastructure: Allocating resources to maintain and upgrade classroom technology, ensuring its long-term sustainability.

By fostering a supportive environment for technology adoption, institutions can empower teachers to integrate digital tools in ways that enhance student engagement, creativity, and critical thinking skills.

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