The Normal Lights
Volume 15, No. 2 (2021)

Technology in Language Education Course: Operationalizing TPCK in Preservice Language Teacher Education

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Abstract This study examines the experiences and attitude of the first cohort of students who took a discipline-focused educational technology course in a teacher education institution. This course, *Technology in Language Education*, utilize Technological, Pedagogical, Content Knowledge (TPCK) framework to train 107 preservice teachers to utilize and innovate with technological tools. The results of the post-evaluation questionnaires answered by 58 of these preservice teachers suggest the achievement of both the program and course learning outcomes. In the follow-up surveys conducted after practicum and during their first year of teaching, evidence of knowledge and skill transfer were expressed. Furthermore, lesson plans evaluated using Harris, Grandgenett, and Hofer's (2010) TPACK-Based Technology Integration Rubric imply the students' fulfillment of the learning outcomes of the course.

Keywords: *Language Teaching; preservice training; technology in teaching; TPCK*

Zara, N. (2021). Technology in language education course: Operationalizing TPCK in preservice language teacher education. *The Normal Lights*, *15*(2), 137 – 163.
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Introduction

To adapt to the changing technological landscape, the Department of Education in 2008, issued the ICT4E Strategic Plan, which details concrete plans on bringing "21st century education for all Filipinos anytime, anywhere" through an "ICT-enabled education system that transforms students into dynamic life-long learners, values-centered, productive, and responsible citizens" (ICT4E Strategic Plan, 2008, p. 6). To achieve this, alignment with both pre-service and in-service training in educational technology is necessary.

In 2008, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) published the *ICT Competency Standards for Teachers* that enumerates concrete expectations and requirements for teachers as regards skills and knowledge needed so they can provide technologically enriched teaching and learning experiences and opportunities for students. UNESCO claims that teachers' preparedness and knowledge in the use of technology to enhance learning experience have become essential in this age. The *Philippine Professional Standards for Teachers* (PPST), a document that articulates performance expectations for all Filipino teachers in different career stages implemented through DepEd Order No. 42 s. 2017, requires "positive use of ICT" (Strand 1.3). Both UNESCO's document and the PPST emphasize how teaching performance requirements have changed and expanded to include the technological literacy of teachers.

This requirement of technological literacy in the new curriculum as part of the pedagogical skill set for teachers begs these questions: How can teacher education institutions (TEI) prepare preservice teachers for this new teaching performance requirement? What essential knowledge and skills are necessary to develop this new skill set—teaching technology and teaching with technology?

Educational Technology Training for Teachers

With the acknowledgment of the need for educational technology training for teachers, the education sector conducted mass and local in-service trainings for technology integration in the classroom. The Department of Education in-service trainings (INSETS) have provided opportunities for teachers to develop these skills (Arcellaz, 2019; Pobre, 2019). Developing teachers' technological literacy has also become a popular discourse in academic research and discussions (Admiraal, Lockhorst, Smit, & Weijers, 2013; Bang & Luft, 2013; Chai, Koh, & Tsai, 2010; Finger et al., 2013; Howard & Scott, 2017; Tsai & Tsai, 2019). These studies, however, reveal several issues that compound technology training for teachers.

Perhaps the most important among these issues is what to teach educators about technology (Reinders, 2009; Mishra & Koehler, 2006). It is unclear what set of skills and knowledge teachers need to maximize the use of technology for teaching. Is technical knowledge enough? The popular assumption that teachers are more likely to apply in teaching technology skills and knowledge that they acquired has led to training efforts that focus on enhancing technical skills on certain tools. This practice, however, brings about another issue—what specific technological tools are necessary to study and use? Is there a reliable set of basic tools and skills that may be applied to a wide range of teaching and learning needs? If there is such a survival toolkit for educational technology, what would comprise this? Considering the pace at which technology advances, even the most basic tools get upgraded rapidly, and it is often difficult to keep up. Furthermore, Reinders (2009) argues that knowing how to use technology is different from knowing how to create teaching materials and activities with it.

Mishra and Koehler (2006) claim that technology integration in teaching is "complex, multi-faceted and situated" (p.1017) in nature. It is multi-faceted since technological knowledge means knowing how it works, using it purposefully, innovating with it, and troubleshooting when technology breaks down. How can technology training address all these needs?

Situating technology is one factor that may shed light on the issue of what to teach educators. Levy (2006 in Reinders 2009) claims that "different contexts may call for different types and levels of knowledge" (p. 231). According to him, it is the teacher's expected roles that may determine what kind of training he/she needs. There is no "one-size-fits-all" training in educational technology.

Another issue is the problem of what method to utilize for technology training. Research shows that technology education has very limited influence on teachers' utilization of technology for teaching (Egbert & Borysenko, 2018). Hence, it is important to think of the most effective method for training that will optimize results. Reinders (2006) discussed several popular methods for technology training. First, **separated or integrated**, where institutions offer a separate program or course for technological literacy while others integrate technology topics in teaching of specific disciplines. Second, **formal or informal** in which some teachers learn technology through the formal environment of training institutions, while others learn it on their own, as part of their personal explorations and experiences of use. Third, **generic or specific** where training programs either offer basic skills that are applicable to a wide range of teaching-learning contexts, or teach a particular skill.

All these methods have benefits and limitations. A separate course tends to isolate skills and limit practical applications, while integrated courses may lack diversity

and depth. While learning in a formal environment provides confidence, it may also limit the scope due to the limited timeframe. Informal learning is more situated and contextualized but it leaves learning to personal motivation and interest. Generic courses may seem ideal, but it brings us back to the question of what basic skills to teach. Specific courses may be too limiting since not all technologies apply to all teaching situations.

Egbert and Borysenko (2018) suggest that for any technology training to be sustainable, teachers should learn technologies that they need and can use in their own context. They claim that "formal preparation based on the perceived needs of teachers might be more successful than broad instruction about specific technologies" (p.2). The course should also provide time for contextual practice. Kay (2006) as cited in Reinders (2009) further suggests providing authentic tasks during training. The kind of practice allows teachers to explore, experiment, and reflect on the technology they are learning in the context of their own practice. Reinders (2009) also suggests that it is important to provide as much hands-on training as possible so that the teachers can experience first-hand and understand what it feels like and what difficulties the students may encounter with the technology. Since it is impossible to learn every technology available, what is also suggested is learning the basic theories and principles of technology integration as a framework for evaluating what technology to use and how to use it in their own classrooms.

Aside from the methodology, another issue is resources. There may be a mismatch between the technology the teachers are learning and the resources that are available in the classroom. That is why teachers may learn new skills, but they may not use it in their own teaching.

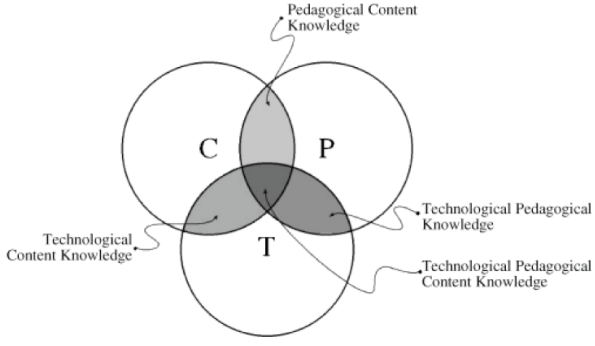
Technological Pedagogical Content Knowledge (TPCK)

Mishra and Koehler (2006) offer TPCK as a framework for understanding the role of technology in the teaching-learning process. It was derived from Shulman's (1986) idea of Pedagogical Content Knowledge. Traditionally, teaching is viewed as composed of two sets of knowledge and skills: (1) pedagogical knowledge and skills; and (2) discipline content knowledge and skills. Teacher training institutions traditionally offer these two sets as separate courses. Shulman argues that pedagogy is not supposed to be isolated and taught independent from the subject of study. There are aspects of both sets of knowledge that should be integrated, knowledge that relates classroom practices in relation to the kind of content taught. This is the realm of pedagogical content knowledge.

In the same way, Mishra and Koehler (2006) see technology as another knowledge domain that has its own set of knowledge and skill requirements. Teaching technology to teachers separately has the effect of isolating it from pedagogy and content. There are domains with content, with pedagogy, and with both. It is best understood in the Venn diagram below.

Figure 1.

Technological Content Knowledge (Mishra & Koehler, 2006).



Knowing how to use computers, for instance, is a technological knowledge. Knowing how to use it to present information to students is a technological pedagogical knowledge. Knowing how to maximize computers to teach writing is technological pedagogical content knowledge.

TPCK framework provides a vantage point for understanding how technology may be used more effectively, purposefully, and appropriately in the teaching of any discipline. This understanding is essential in knowing what kind of training teachers need as regards technology. Using this framework, we see that a more efficient technology training for teachers is the kind that will teach them specifically, in a more situated way, the technological skills they need to teach their disciplines. The framework helps identify more concretely what these knowledge and skills are.

Using TPCK in technology training for preservice teachers is not new. In fact, Chai, Koh, and Tsai (2010) used TPCK to teach 889 preservice teachers preparing to teach secondary school students and investigated the effectiveness thereafter. They quantitatively analyzed pre-course and post-course survey questionnaires data revealed significant gains. In 2011, the Australian government initiated the Teaching Teachers for the Future (TTF) Project in which preservice teachers from 39 teacher education institutions all over Australia were trained to use information and communication technology for teaching using the TPCK framework. In 2012, the TTF TPACK Survey was conducted to all participating institutions to evaluate the program. The survey revealed that the program was able to develop confidence in using ICT for teaching (Finger, et al., 2013). Tsai and Tsai (2013) also used TPCK as a framework to understand the different conceptions of preservice teachers' use of mobile devices and how this impacts the way they designed lessons. Using the TPACK-based Technology

Integration Assessment Rubric by Harris, Grandgenett, and Hofer (2010), they discovered that lesson plans of preservice teachers with more constructivist conceptions of technology use proved more effective. What these studies tell us is that training teachers to use technology should not be divorced from content and pedagogical knowledge, hence TPCK, especially for preservice teachers who need to make sense of the use of technology in the bigger context of teaching-learning processes.

TPCK in Pre-service Training of Language Teachers

From a teacher training perspective, the challenge is what to teach preservice language teachers about technology for their classroom and how to teach them technological skills specifically for language teaching.

In response to the need to develop subject-focused technological literacy, the TEI research locale of this study operationalizes TPCK specifically in language teaching by offering a specialization course that bridges technology and language education—*Technology in Language Education*. It is a specialized course that explores affordances of technology that may be used to facilitate a technologically supported language classroom. The course is an eclectic blend of approaches, offering a formal (but has built-in provisions for informal learning), integrated, and generic approach to learning educational technology specific to actual practices and challenges of language learning. It is formal because it is a required course in the program; however, the course content allows personal explorations of different alternative technological resources that will achieve the specific objectives. For instance, on the topic of digital narratives, the students are encouraged to research and explore different applications that will allow them to tell visually captivating

stories. It is integrated because the technological skills they previously learned from their general education technology course is applied to language teaching. It is generic because it focuses on basic language teaching skills (e.g. presentation tools, teaching writing, teaching speaking, and other skills) rather than specific technologies. It is specific because it also trains preservice teachers to assess resources available and work within the boundaries of accessibility and feasibility. This course is the first attempt of the TEI to integrate a contextualized educational technology training. Thus, it is important to investigate the effectiveness of the course in achieving its intended objectives.

The study aimed to determine if a contextualized educational technology course, *Technology in Language Education*, will lead to positive experiences for learners. The main objective of the study was to assess the effectiveness of the first implementation of the course in developing among its students, preservice language teachers, the skills to utilize appropriate technology optimally and purposefully in their teaching. The study aimed to achieve this objective by evaluating the course in three phases--through a post-course evaluation survey, a post-practicum survey, and an in-service survey.

The study sought to answer the following questions:

- How do the students perceive their experiences in the course?
- What skills, values, and attitudes toward the use of technology in language teaching gained in the course were applied in their practicum and their first year of teaching?

Methodology

Research Design

This is a mixed-method study that followed students of the course from its implementation during the first semester of the school year 2016 – 2017, their practicum, and a year after graduation in their respective schools of practice. To answer the first research question, the course was evaluated at the end of the school year using validated questionnaires for students. The post-course evaluation intended to gather relevant insights regarding their experiences in the course. Not only is this important in understanding the students' attitudes towards their learning experiences but it also draws relevant information about the strengths and weaknesses of the course for further improvement.

The second question was essential in investigating if transfer of knowledge and skills indeed occurred. It was a way to investigate the achievement of learning outcomes. The participants were given the same set of open-ended questions online twice at a one-year interval: after their practicum teaching and during their first year of teaching. Sixteen students participated in this post-practicum survey. Fifteen students participated after a year during their first year of teaching. They were also asked to share sample lesson plans that utilized technology to further verify the fulfillment of the objectives of the course in designing lesson plans.

Instruments

There are two researcher-made instruments. The first instrument, a content-validated questionnaire that aims to solicit feedback regarding the course, is composed of three parts. The first part evaluates the students' perception of achievement of both program and course learning outcomes

using a four-point Likert scale. The second part, also a four-point Likert scale, asks the students to rate their level of satisfaction regarding different activities and experiences in the course. The last part is composed of open-ended questions that solicit more insights from the students regarding their difficulties and other suggestions for the improvement of the course. The second instrument is a set of questions sent to the participants online. There are three major questions: (1) What concepts, tools, and skills do you still remember from your *Technology in Language Education* course? (2) What concepts, tools, and skills are useful during your practicum/ in practice? (3) What concepts, tools, and skills do you suggest the course should improve on? This set of questions was used twice—during practicum and one year after as practicing teachers.

Participants and Ethical Considerations

Purposive sampling was done in the three phases of the research. Criteria for selecting participants are the following: attendance in the course and willingness to participate in the survey. The post-evaluation survey was also conducted at the end of school year one semester after the course, to ensure credibility of responses. During the second phase, the following criteria were used to select participants: students of the course, completion of the practicum, and willingness to answer the questions. During the third phase, after one year, the following criteria were used to select participants: students of the course, currently teaching English, and willingness to participate. In all phases, participants were informed of the nature and purpose of the research. The post-evaluation questionnaire includes clear statements of the intent of data gathering and the general purpose it serves. Consent was also secured during the post-practicum and in-service data gathering through online means.

Data Collection and Analysis

The responses from the Likert items were summarized using descriptive statistics (weighted mean) and the rest of the qualitative responses were summarized using thematic coding technique.

Table 1.

Phases of the Research

Research Question	Phase	Data	Analysis	Year
What is the attitude of the preservice teachers to the course?	Phase I: Post-course evaluation survey	Evaluation responses to Likert Questionnaire	Descriptive Statistics	2017
		Qualitative Responses to open-ended questions	Thematic coding	2017
What course learning outcomes of Technology in Language Education course were achieved by students?	Phase II: Post-practicum	Responses to open-ended questions	Thematic coding	2018
	Phase III: During first year of teaching	Responses to Open-ended questions	Thematic coding	2019
		Lesson Plan Samples	Document analysis using Harris, Grandgenett, and Hofer (2010) TPACK-Based Technology Integration Rubric	2019

The rubric used, Harris, Grandgenett, and Hofer (2010) TPACK-Based Technology Integration Rubric

identified the evidence of knowledge and skill transfer based on the course learning outcomes. This rubric is a four-point scale which evaluates four dimensions of the lesson: curriculum goals and technologies, instructional strategies and technologies, technology selection, and "fit" (content, pedagogy, and technology together).

Results and Discussion

How do the students perceive their experiences in the course?

Fifty-eight (58) respondents positively perceived achievement of both program and course learning outcomes. Table 2 shows weighted mean of the responses Part I of the survey questionnaire on achievement of outcomes. In this part, respondents were made to choose among the following: 4-Completely Achieved, 3-Mostly achieved, 2-Partially achieved, 1-Not achieved, and 0-Not evident.

Table 2.

Achievement of Outcomes

Outcomes	Weighted Mean of Responses
Program Outcomes	3.58
Course Learning Outcomes	3.61

Table 2 shows that the respondents positively believe that both program and course learning outcomes have been highly achieved by the students in the course (weighted mean of 3.58 and 3.61 respectively). Particularly high are the outcomes that directly pertain to teaching using technology. There is also a strong claim of achieving proficiency in selecting, designing, and utilizing appropriate technology for

language teaching. Dealing with challenges and issues and adopting the right attitude and values in using technology also received very favorable ratings.

Table 3 summarizes responses on their evaluation of the different experiences in the course. This table also provides the weighted mean scores of Likert responses to the following options: 4-highly satisfactory; 3-satisfactory; 2- unsatisfactory, 1-very unsatisfactory.

Table 3.

Learning Experiences

Indicators	Weighted Mean of Responses
Class participation	3.42
Optimizing limited resources	3.64
Use of technology inventory	3.31
Use of technology for teaching	3.48
Evaluating technology	3.51
Materials production using technology	3.58
Awareness of critical issues of using technology	3.44
Other practical applications (other courses and personal uses)	3.61

Table 3 shows that responses are also favorable in all aspects of the learning experiences.

Table 4 summarizes highlights of qualitative responses. The following are the highlights of the comments: (1) They claimed to have gained valuable insights about teaching the different language macro skills using technology. (2) They have enhanced certain values such as creativity, innovation, and resourcefulness. (3) Responses may not be very high in the aspect of problem solving, troubleshooting, and dealing with critical issues about technology, but

they expressed significant insights in these aspects. These responses show that students learn to take a more critical and cautious attitude towards technology use.

Table 4.

Qualitative Responses

Themes	Highlights
Gained insights about teaching different macroskills	*The technology has made language teaching easier, more interactive and creative.*
	I learned that there is a variety of resources that a teacher can use language teaching.
Enhancing certain values such as creativity, innovation, and resourcefulness	*With the help of different situations, I was able to assess the appropriateness and relevance of the technology used.*
	Some technologies require certain skills to be able to operate them and maximize their potentials as tools, so I tried to familiarize myself with these technologies and I also tried to search for reviews and tutorials.
	Complexity of using technologies new to my experience as a learner. I slowly tried to cope with the complexity by learning the things I am not good at.
Developed problem solving, troubleshooting, and dealing with critical issues about technology	*Use technology creatively and wisely.*
	Technology can be used in both aspects (good and bad).
	Not all websites can be used in teaching because website have their limitation. As teachers, we should ensure that the purpose of using a certain technology in teaching should be the first thing to consider.

The survey results support the findings of Chai, Koh, and Tsai (2010) that experiences in learning technology

is more positive if it is purposefully contextualized in the specific pedagogical demands of the content. It can be noted that students appreciated most how digital tools help in developing appropriate content. The qualitative responses below support this claim.

While the experiences were generally positive, they also experienced difficulties and challenges. Table 5 summarizes the responses.

Table 5.

Challenges, Problems, and Solutions

Challenges/Problems	Responses/Solutions
Slow internet connection	• Utilized school and community resources (Computer Shops, Library, and Computer Laboratory)
Availability of resources	• BYOD (Bring-your-own-device) • Utilized school and community resources (Computer shops, Library, and Computer Laboratory) • Maximizing available resources
Lack of Technical Skills	• Learning on their own using online tutorials and practicing on their own time • Asking help from mentors
Lack of Time	• Teamwork • Extending working period after class hours

While the course encouraged flexibility in resources, the university's limited resources still posed a challenge. This confirms Coffman's (2013) claims that making technology training for teachers successful would require not only training but also the availability of technology. Nevertheless, the course allowed them to demonstrate innovation and creativity in responding to the issues and problems of limited resources. The responses in Table 5 provide further evidence

of problem-solving skills, flexibility, and resourcefulness in using technology.

To improve the course further, their suggestions are summarized as follows: (1) more time; (2) increase access to resources especially computers and Internet; (3) focus on certain areas of language teaching such as listening and research; (4) more hands-on activities; and (5) troubleshooting techniques.

What skills, values, and attitudes toward use of technology in language teaching gained in the course were applied during their practicum and in their first year of teaching?

To answer this question, a set of questions was sent online twice at a one-year interval—after practicum (16 students participated) and during the first year of teaching (15 students participated). Sample lesson plans were also evaluated to check for realization of course outcomes. Table 6 below shows the concepts, tools, skills, and values they remembered from the course.

Table 6.

Remembered Concepts, Tools, Skills, and Values

Dimensions	Practicum (A year after)	In practice (Two years after)
Concepts	Gamification, blended learning, TPCK, low-tech efficiency, digital literacy, new literacies	Digital content creation, trends, Online learning, blended learning, Online games, Online forums, web-enhanced learning, TPCK
Tools	Presentation tools, collaboration tools, learning management tools	Edmodo, Schoology, PowerPoint, Powtoons, Prezi, Canva, Adobe Spark, Screencast-o-matic

Skills	Improvisation, technology evaluation, exploring alternatives, critical thinking	Identifying and selecting appropriate technology; preparing technology for use, technology integration, video editing,
Values/ attitudes	Collaboration, flexibility, efficiency	Resourcefulness, flexibility, creativity

Concepts such as blended learning, TPCK, digital, and online learning are topics that were recalled. The online tools that were explored in the course were also strongly remembered. They also claim to remember the importance of selecting appropriate resources, flexibility, and resourcefulness.

These are the same concepts, tools, skills, and values that they found useful in practice. Table 7 summarizes the results of concepts, tools, skills, and values taught in the course that proved useful in practice.

Table 7.

Important Concepts, Tools, Skills, and Values in Practice

Dimensions	**Useful in practice**		**Should be strengthened in the course**	
	Practicum (A year after)	**In practice (Two years after)**	**Practicum (A year after)**	**In practice (Two years after)**
Concepts	Flipped classroom, Gamification	Gamification, flipped classroom, online applications, using web-based applications	Balancing between modern and traditional technology; practice in situating technology, game-based learning	Media literacy, hypertext and intertext, positive use of social media, maximizing LMS, more emphasis on gamification,

Tools	Applications, SNS, presentation tools	PowerPoint, videos, online games, Edmodo, Schoology, Kahoot, Menti, Quizz, Powtoons, Prezi, Screencast-o-matic, Plicker	Upgrade tools	More offline resources, more collaboration tools, low technology options, basic apps
Skills	Improvisation, using available resources, innovating with available technology, evaluating technology	Selecting appropriate tools, dealing with limitations of resources, exploring available resources	Troubleshooting, more emphasis on adaptation and improvisation, focus on basic technology	Manipulating common everyday teaching equipment (e.g. projectors, laptop, etc.), Designing lessons using technology
Values/ attitudes	Being responsible with the use of technology, resourcefulness, creativity, flexibility, and efficiency	Creativity, resourcefulness, maximizing available technology		

It is quite interesting to note that the participants seemed to remember more of the concepts when they are already in practice. It is possible that the requirements of practice, as they plan and execute their lessons every day, triggered the recall to address and respond to the needs of the classroom. The demands of actual teaching prompted them for further explorations. This further supports the effectiveness of the program through encouragement of informal learning in developing confidence in exploring the vast array of tools available for teaching. This affirms Bandura's (1977) claim that self-efficacy is developed through "mastery experiences." The demands of everyday teaching provide opportunities for in-service teachers to practice and hone their skills further in using and adapting appropriate technology to their needs.

The enumeration of the concepts, tools, and skills that they feel the course needs to improve in the last two columns of Table 7 reveals more situated and pragmatic concerns. They started to see the course from the perspective of real-world practice. What is striking in these responses is their request for more emphasis on more traditional technology and how to blend them into more advanced tools. As they encounter limitations in resources in actual practice, they realize even more that using technology is limited by availability and access. What is often available and accessible are the more traditional tools. Despite this, there is also an emphasis on teacher agency in matters of improvising and resourcefulness in utilizing available tools.

Eight (8) lesson plans were submitted for analysis and evaluation using Harris, Grandgenett, and Hofer (2010) TPACK-Based Technology Integration Rubric. Table 8 presents the mean score and the standard deviation of the results of the evaluation. It should be noted that each dimension is graded using a four-point scale.

Table 8.

Technology Integration Assessment

Dimensions	Mean Score	Standard Deviation
Curriculum Goals and Technologies	2.63	.52
Instructional Strategies & Technologies	2.88	.83
Technology Selection	2.63	.52
Fit	2.63	.92

*n=8

It can be noted from the results that technology use in these sample lessons is just within the satisfactory range. In fact, among the technology used in the lesson plans are

presentation tools such as PowerPoint, instructional videos, and video clips. While technology use is mostly for knowledge transmission, there are some attempts to use technology to extend learning experiences outside of classroom time using online collaboration resources that facilitate online discussions and enable collaborative activities. These results, however, are from a limited sample of lesson plans so the findings can barely be conclusive. The results could change if more samples become available.

Despite the small number of lesson plans analyzed, these results seem to echo previously conducted studies regarding practicing teachers' use of technology. Teachers in practice have the proclivity to use technology conventionally, which is mostly for presentation rather than in more advanced ways (Admiraal, Lockhorst, Smit, & Weijers, 2013; Bang & Luft, 2013). It seems that other factors affect the actual use of technology in practice more than their acquired training during preservice such as efficiency, ease of use, and perceived norm. A literature review on factors affecting primary teachers' use of digital technology conducted by Spiteri and Rundgren (2020) reveal that school culture is one important factor. There are school cultures that empower use and there are also those that are not encouraging towards use of technology. Kara and Cagiltay's (2017) research among in-service preschool teachers also concur that school support in terms of facilitative curriculum and programs along with access to technological resources result in a more positive attitude towards technology use. This somehow suggests that skills development requires a conducive environment for the application of the said skill.

Conclusions and Recommendations

The study was conducted to investigate whether the contextualized educational technology course for language

teaching will be effective in developing the practical skills of pre-service teachers. At the time of the study, it was the first course that attempted to apply TPCK in the design of a pre-service course for teachers. Thus, the evaluation of the course is essential not only in improving it for its succeeding iterations, but also in informing other teacher institutions about the viability of such course.

Thus, this study followed the first cohort of students who took the course in a teacher-training institution in Manila, the Philippines, through their practicum and until their first year of teaching. A post-evaluation survey was conducted after course, followed by a set of questionnaires sent online on two different occasions: after their practicum and during their first year of teaching.

The results of the post-course evaluation were positive. There seems to be a high degree of satisfaction with the course. Furthermore, respondents felt that both the program and course outcomes were successfully achieved; however, some language teaching areas, such as listening and research, were insufficiently addressed. The limitation in terms of time is a contributing factor in the scope of topics and skills covered by the course.

Limited access to technology, which are essential for practice, was also an issue. Such is very evident in the way the respondents handled problems and issues in their projects. The same is true with issues and problems in practice during practicum and their first year of teaching. They had to navigate within the limits of accessible and available technology in their own contexts. During actual teaching, the participants realized that this limitation in resources is also prevalent in actual teaching contexts. Therefore, the improvisation, flexibility, and creativity they learned in the course became useful in their teaching.

Selecting and utilizing appropriate technology is one course outcome that seems to be consistently expressed in their responses in the post-course evaluation and in the follow-up surveys, although it was barely evident in the surveyed lesson plans. As regards, designing and utilizing materials for language teaching, this was somewhat achieved since they prepared presentation materials and online assessment materials for their classes. Availability of resources and the school support are important factors that affected their use of technology. Teachers may have the skills, but the lack of access and the lack of facilitative environment might have affected applications of skills learned.

While there is an indication of success, the course may be improved in the following areas: (1) A stronger emphasis on flexibility and resourcefulness is necessary. (2) More deliberate strategies and techniques in developing independence and confidence in exploring technology should be taught. (3) The course should also contextualize the use of technology in actual lesson plans so the skills they learn become integral in the lessons. (4) The course also can emphasize optimization of basic technological resources in teaching. They realized that in practice, these are still the tools and resources available for teachers.

While the research revealed important insights about outcomes of the course, other sources of data may be collected to verify the results: (1) follow up observations in the students' off-campus teaching and eventually in their beginning practice to validate the impact of the course in their practice; and (2) collection of more actual teaching artefacts such as lesson plans and teaching materials can be done for further validation.

Due to the time gap between the different phases of collection of data, there was a very high degree of attrition of participants. Hence, the data collected in the second and

their phases were only 26% (from 58 students to 15 students in the last phase). The number of lesson plans analyzed was also limited. To address these limitations, there should be clear and systematic provisions for gathering contact details of participants to make monitoring more efficient. The data were also largely drawn from self-reports. It would be good to gather and analyze other artefacts of teaching such as class observation reports and students' outputs.

Despite the limitations of the study, the results support that *Technology in Language Education* course can be a model for the application of the TPCK framework in other subject areas. The experiences of this first cohort of learners are important in understanding how other contextualized educational technology courses can also be developed not only in language teacher education but in other disciplines. Therefore, the refinement of this course is in the best interest of furthering teaching practice in general.

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