



TECHNOLOGY INTEGRATION IN PRE-SERVICE TEACHER EDUCATION: PROCESS AND REFLECTION

BY

Annalene Grace E. Co¹, Rosalyn L. Delizo²

¹College of Teacher Education, Quirino State University Maddela Campus, Dipintin, Maddela, Quirino 3404 Region 02, Philippines

²College of Teacher Education, Quirino State University Diffun Campus, Andres Bonifacio, Diffun Quirino 3401 Region 02, Philippines



Article History

Received: 04/12/2022

Accepted: 12/12/2022

Published: 14/12/2022

Vol – 1 Issue – 9

PP: - 06-10

Abstract

The paper focused on pre-service teachers' experiences with technology integration, which included writing lesson plans, developing technology-based instructional materials, and implementing the lesson plans in actual classes. Twenty-seven elementary and secondary education pre-service teachers enrolled in technology courses were included. The data, which primarily came from the electronic portfolios of pre-service teachers, were analyzed using a qualitative method. The cognitive and emotional dimensions of the pre-service teachers' experience in the preparation and implementation of technology-enhanced lessons appeared to be influenced by a dynamic interaction of factors such as the pre-service teachers' skills in using technology tools and planning instruction, the presence of affective support, and the response and engagement of the children, according to the analysis of the reflections. All of these

Keywords: Technology integration process, Technology in Technology and Livelihood Education, Pre-service Teacher Education Program. Technology-enhanced Lessons, Electronic Portfolios

I. Introduction

The use of technology in technology and vocational education has always been a source of contention. Excessive media consumption has been linked to negative outcomes such as attention deficits and academic difficulties, according to research (American Academy of Pediatrics, AAP). According to the AAP, children under the age of two should not be exposed to television or other forms of entertainment media. While there are some negative effects, others have pointed out the benefits of technology in education. Technology has aided in promoting a more constructivist approach in the classroom. It has aided in promoting a more constructivist approach in the classroom. It has created more open-ended environments for children to explore (Mantusevich, 2015).

The latest position statement on technology and young children issued by the National Association for the Education of Young Children (NAEYC) addressed specific issues concerning a child's interaction with technology. The position statement emphasized that technology and interactive media become effective tools to support learning and development when used intentionally and appropriately, and that intentional use necessitates educators and administrators being aware of the implications (NAEYC, 2014).

According to a survey of teachers and administrators from developed countries, the trends in technology use in classroom settings are as follows: it is used regularly but not excessively; it is used because children enjoy it and it helps meet program goals; it is used more for support than direct instruction, and what is used follows availability; and that there were differences between beliefs and practices for the amount of time with technology (Mc Manis, Nemeth, Simon, 2012).

The benefits of the use of technology can be maximized in the education of young children if the teachers have the knowledge and skills necessary for evaluation, choice, and utilization of appropriate technology. These knowledge and skills are ideally an integral part of the goals of teacher education programs. Due to limited exposure to the use of technology by university teachers as well as the fast-paced changes (De Santis, 2016), pre-service teachers often are not prepared for integrating and using technology in the classroom (Koch, 2015).

Context

The National Competency-Based Teacher Standards developed by the Department of Education include strands pertaining to teachers' ability to use technology for instruction (DepEd, 2006). In response, the Commission on Higher Education recognizes the importance of developing TLE

teachers' technical skills. It specified technology-related courses in its set of policies, standards, and guidelines for teacher education. Information and Communication Technology (ICT) and Computer-Aided Design are two educational technology (EdTech) courses (CAD).

In the Philippines, a study of four teacher education institutions in the National Capital Region discovered that TLE majors had significantly lower perceptions of their ability to integrate technology into a learning environment than other teacher education majors at the same institutions (Del Rosario, 2017).

The program of Teacher Education is mandated by Commission on Higher Education Memorandum Order No. 30 (CHED 2017). Students must complete 6 units of Educational Technology Courses. Pre-service teachers can use their knowledge from these courses to implement technology-enhanced lesson plans. They create the lesson plan as well as technology-based instructional materials like electronic lectures/PowerPoint presentations, interactive activities, and online assessments.

Fourth-year education students at Quirino State University, where this study is taking place, focus on the application of what they have learned in strategy courses. Following field study experiences and strategy courses in their lower years of the teacher education program, the fourth year exposes pre-service teachers not only to observe but also to have teaching experiences. They are provided with the opportunity to integrate technology into teaching.

Technology Integration Process

The technology integration process included the following four phases shown in Figure 1:

- 1) Observation of target learners. During their Observation and Assessment courses, the pre-service teachers were provided opportunities to observe classes in their cooperating school. They learned about the students' interests and characteristics. They also learned about the routines and classroom management practices of the resource teachers.
- 2) Planning and Preparation
 - a. Consultation with the resource teachers. Each pre-service teacher met with the resource teacher several times to discuss the theme, topic, and instructional objectives that the pre-service teacher will focus on when he/she prepares the technology-enhanced activity plans and materials.

- b. Preparation of the technology-based activity plan. The activity plan is a literature-based plan. The take-off point of the activity plan is a story that has elements that relate to the theme and topic assigned. Title, focus/essential questions, unit summary, subject area, learning outcomes, pre-requisite skills, technology integration outcomes, instructional strategies, grouping options, scaffolds, time allotments, options for differentiated instruction, assessment strategies, follow-up activity, materials, and resources, including technology hard and softwares.

The pre-service teacher consulted both the resource teacher and the instructor while preparing the activity plan. The plan is approved by the instructor for implementation.

- c. Preparation of Technology-Based Instructional Materials. Based on the approved activity plans, the pre-service teachers prepare the following:
 - c. 1. electronic lecture or PowerPoint presentation of the lesson. It addresses the theme, topic, and skills of the activity plan.
 - c. 2. E-flashcards. It is a PowerPoint presentation used in the lesson as a way to unlock the meaning of important terms in the topic. It was also used to provide exercises about the concepts learned.
 - c. 3. Individual interactive activity. Each pre-service teacher designed a one-on-one interactive activity for each student to work on the computer. This activity targets the skills just learned. It provided an opportunity for the students to practice their skills.
 - d. Critiquing of technology-based materials. The pre-service teachers present drafts of the e-book, one-on-one activity, and activity sheets to the instructor for critique. Revisions are made until it is approved for demonstration.

3). Implementation. Each pre-service teacher conducted two lesson demonstrations in the same class. During these two separate days, they utilized all the technology-based materials they created. They also had a choice to use existing materials like videos from Youtube.

4). Reflection. The pre-service teachers wrote narratives and reflection papers about the experience. All technology-based materials and documentation of the lesson demonstrations and students' outputs were incorporated into their individual e-portfolio which were capped by their narratives and reflections.

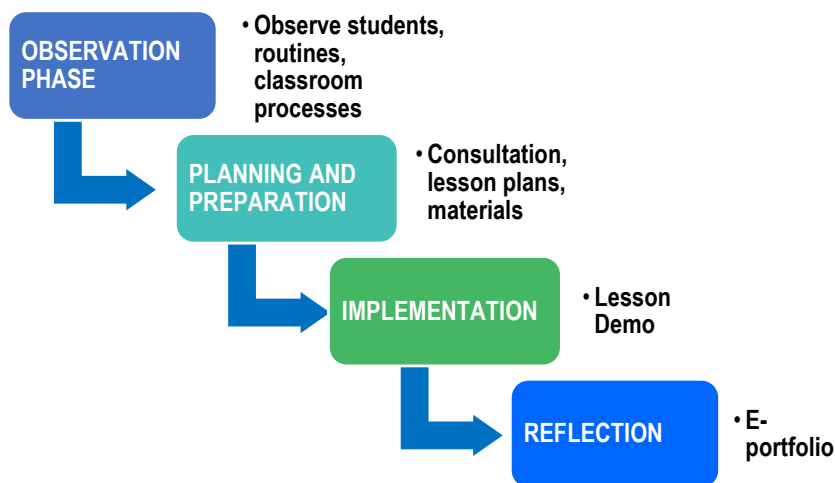


Figure 1
Technology Integration Process in the Classrooms

Theoretical Framework

Kurt Lewin's Field Theory was centered on the concept of living space, which referred to all of the internal and external forces that act on a person (Friedman and Schustack, 2009). It contains all of the possible facts that influence an individual's behavior. The living environment then influences behavior (Hall, Lindzey, and Campbell, 2013). Lewin's definition of personality focused on the individual's current state - the concept of contemporaneous causation.

Lewin's orientation can be seen as cognitive because he was so close to what was going on in a person's mind at any given time. However, he also focused his attention on the situation, making it an interactionist position. The current study investigated the cognitive and socio-emotional dimensions of pre-service teachers' technology integration process.

Kurt Lewin (1951) developed a "force field analysis" model in which any current level of performance or being is described as a state of equilibrium between the driving forces that encourage upward movement and the restraining forces that discourage it. Positive factors that push or enable one to move toward a goal are referred to as driving forces. The restraining forces are negative, often emotional, illogical, unconscious, and social/psychological factors that impede progress toward the goal. Both sets of forces are very real and must be considered when analyzing a person's experience in completing a complex task, such as technology integration in teaching. The current study examined pre-service teachers' narratives and reflections in order to identify both driving and restraining forces.

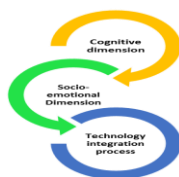


Figure 2

Kurt Lewin's Theory and Technological Integration

Research Questions

For this study, the researcher was interested in the experiences of pre-service teachers in technology-based instruction. Specifically, the researcher investigated the dimensions of the experience, the intervening variables (both driving and restraining), and the insights gained as the pre-service teachers integrated technology into instruction.

The following questions were specifically investigated:

1. What is the cognitive dimension of pre-service teachers' technology experience?
2. How can the pre-service teachers' technology integration experience be described in terms of its socio-emotional dimensions?
3. What were the motivating and discouraging factors that influenced pre-service teachers' technology integration experiences?
4. What observations did the students make about their experiences?

II. Methods

The qualitative research method was used. Each pre-service teacher created and submitted a portfolio of electronic technology integration. The data for this qualitative study came from portfolio narratives and reflections. Statements were coded and analyzed to identify emerging patterns and themes. The exposed cognitive and socio-emotional dimensions of the experiences, as well as the intervening variables and both driving and restraining forces that acted upon as they embarked on the technology integration process.

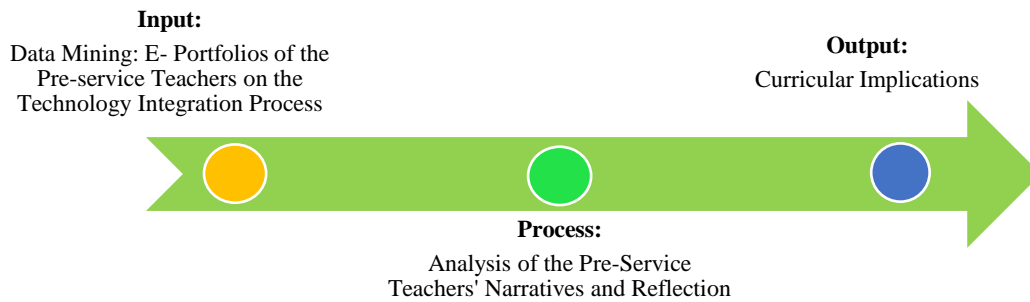


Figure 3
Research Paradigm

Participants of the Study

This study included 27 fourth-year students pursuing a Bachelor of Secondary Education Major in Technology and Livelihood Education and a Bachelor of Elementary Education who enrolled during the first semester of the 2019-2020 school year. They were between the ages of 18 and 22. There were nine males and eighteen females.

III. Results and Discussion

Throughout the four steps of the integration process, the coded statements in the narratives and reflections reflected the cognitive dimension of pre-service teachers' experiences. During the observation phase, students' developmental characteristics, interests, and abilities are assessed, and they are challenged to develop developmentally appropriate technology-enhanced materials and activities. During the preparation phase, the pre-service teachers faced challenges in their executive functions, particularly in planning, deciding, and prioritizing tasks; creating original lectures that integrate the themes and identified skills for the lessons assigned to them; and applying technical skills that they already possessed as well as learning more technical skills to meet the course's demands. Problem-solving, flexibility, and alertness in dealing with multi-tasks in the classroom were evident during the implementation phase. During the reflection phase, they used metacognitive skills to assess their own performance and gain insights.

The coded statements in the narratives and reflections likewise reflected the socio-emotional dimensions of pre-service teachers' experience throughout the four steps of the integration process. In the observation phase, pre-service teachers expressed enjoyment of watching the students in different parts of the day. In the planning and preparation phase, they went through doubt and anxiety while thinking of how they will go about the technology integration tasks. They also felt frustrated with several revisions they had to make. During the implementation phase, the pre-service teachers described the experience as involving a "roller coaster" of emotions. Most of them felt nervous about beginning the lesson demonstration. While most were nervous, they also felt excited about sharing their work with the students. Most enjoyed interacting with the children. The reflection phase revealed feelings of satisfaction for others and dissatisfaction

for some. Most of them felt happy expressing a stronger resolve to be in the teaching profession.

Factors that intervene. Further examination of the coded statements revealed intervening variables or factors that influenced the dynamics of their cognitive and emotional experiences. Both restraining and driving forces were among the intervening factors.

In a classroom, demonstrating a lesson. Pre-service teachers have little classroom teaching experience. This made them nervous, as the majority of them had no prior teaching experience. Initially, it appeared that this was a constraint because it raised many concerns, particularly about whether the children would like and respond to them. However, the excitement of presenting their work to students in a real class eventually motivated them to do their best.

Receiving feedback and support from their instructor. Respondents initially felt discouraged when corrections and revisions were given. Later on, however, they appreciated how the critiquing process help them improve their work and make them more confident during the demo. The guidance and scaffolding provided by the instructor made them think of better ways to present their work. Reflections showed that the critiquing process was a driving force that led them to be more confident in what they will share with the children. Scaffolding authentic learning experiences were seen as very important as revealed in a synthesis of research on technology integration (Tondeur, 2015).

Student's response and level of engagement. The student's responses were a driving force that reinforced the pre-service teachers' confidence in teaching. Their anxiety and worry about whether the children will like them and what they prepared dissipated as soon as the students showed excitement, listened intently, and participated actively in the pre-service teachers' lectures and activities.

Having a supportive environment. Most of the respondents mentioned the role that family and friends played in helping them perform well in the technology integration tasks. Families and friends provided encouragement. Classmates and friends were also sources of ideas and suggestions for the technology-enhanced materials that they were doing.

The teachers and personnel of the school where they conducted the demos also provided encouragement and support which further boosted the pre-service teachers' confidence in what they were doing.

Faith in God. Most of the participants mentioned praying and relying on God's grace to do well in the lesson demonstration. This helped them overcome anxiety and to be inspired. During setbacks and feelings of being overwhelmed by the technology integration tasks as well as other school requirements and other personal problems, students shared how their faith in God has helped them. God is a strong driving force in their lives.

Pre-service Teachers' Insights. The narratives and reflections that highlighted the pre-service teachers' insights were divided into two categories: self and teaching skills.

Concerning themselves, pre-service teachers (1) recognized their potential to be good teachers, (2) validated their skills in dealing with children, (3) identified areas for improvement in themselves, and (4) recognized the importance of enthusiasm in teaching.

Concerning teaching abilities, the pre-service teachers (1) emphasized the importance of being an intentional teacher as manifested in planning and deciding what to do and how to do it, (2) recognized the importance of establishing rapport with younger students prior to any teaching-learning, and (3) believed that they should be organized and prompt in preparing their lessons.

IV. Conclusion

Students study technology education for four years. This has given these pre-service teachers the opportunity to practice using technology in the classroom with students. The experience has helped them validate their own teaching potential and actual skills. It has confirmed their decision to work in education.

The cognitive and emotional dimensions of pre-service teachers' experience in the preparation and implementation of technology-enhanced lessons appeared to be influenced by an interaction of factors such as the pre-service teachers' technology and planning skills, the presence of environmental support, and even the students' response and engagement. All of these factors should be taken into account in the future for a more deliberate implementation of the technology-integration process for Teacher Education programs.

The following implications are drawn for the teacher education curriculum:

1. Alignment of learning activities and requirements in technology courses with actual basic education curricula in use in schools;
2. More technology integration in other courses in the teacher education curriculum to allow university

professors/instructors to model and pre-service teachers to practice; and

3. Prior to the student internship, the intent is to focus on technology integration in field study courses.

BIBLIOGRAPHY

1. American Academy of Pediatrics Media and Children; retrieved from: <http://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/pages/media-and-children.aspx#sthash.ZCYfMu9X.dpuf> on June 24, 2020.
2. CHED (2004) Commission on Higher Education Memorandum Order No. 30 Policies, Standards and Guidelines for Teacher Education, Philippines: CHED.
3. DeSantis, J.D., Rotigel, J.V. (2016) Evolving a technology integration ethos: technology habits of pre-service and in-service teachers. *Journal of Instructional Pedagogies*.
4. Del Rosario, M.T. (2017) Technology integration in teacher education programs in the Philippines: an international development perspective. Proquest Information and Learning Company. UMI no. 3269057.
5. Friedman, H.S. and Schustack, M.W. (2013) *Personality: classic theories and modern research*. USA: Pearson International Edition.
6. Koch, A.S. (2015) *Teacher education and technology integration: how do pre-service teachers perceive their readiness to infuse technology into the learning environment*. UMI Dissertation Publishing. UMI Number: 3379183.
7. Hall, C.S., Lindzey, G and Campbell, J.B. (2013) *Theories of Personality*, 6th Ed. USA; John Wiley and Sons.
8. Mantusevich, Melissa (2015) *School reform: what role can technology play in a constructivist setting?* Retrieved from: <http://pixel.cs.vt.edu/fis/techcons.html> on June 20, 2020.
9. NAEYC (2015) *Position statement on media and technology for young children*. Washington DC: NAEYC.
10. Tondeur, J., van Braak, J., Sang, G., Voog, J., Fisser, P., Leftwich, Ann (2015) *Preparing pre-service teachers to integrate technology in education: a synthesis of qualitative evidence*. Elsevier: *Computers & Education xxx I-II*
11. Vrasidas, C., McIsaac, M. (2015) *Integrating technology in teaching and teacher education: Implications for policy and curricular reform*. Educational Media International, (38).