



Reflective Experiences as Basis for Assessment of Science Preservice Teachers

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Assessment of the different reflective experiences plays a significant role in science preservice teachers' professional development. It includes the difficulties, coping mechanisms, and implications of ten science preservice teachers in one University in Leyte purposely selected as participants. It employed a descriptive single case study patterned with the Reflective Practice Model of Gibbs 1988 and the Coping Mechanism Theory of Lazarus and Folkman (1987). The study utilized questionnaires in Google form, in-depth interviews, focus group discussions, and observation notes to gather data. The researcher used the thematic analysis of Braun and Clarke (2006) in the data analysis. The study's findings revealed the difficulties of science preservice teachers, such as unstable internet connectivity, classroom management, lack of knowledge on technological integration in teaching, and inability to submit given tasks on time. Coping mechanisms include positive disposition, interactive lessons, technology integration in teaching, and time management. Implications identified as learning while teaching, experience is the best teacher, and assessment of one's strengths and weaknesses. Results of the study point out to school administrators to review the practice teaching manual, enhance the feedback mechanism on the part of supervising teacher educators and expose preservice teachers to more reflective activities that will help them reflect, analyze and assess their strengths, weaknesses, what to improve and the impact of their whole teaching practicum.

Keywords: Reflective experiences, portfolio, assessment, preservice teachers, single case study,

Introduction

Preservice education prepares teacher interns to teach the necessary knowledge and skills through their practicum experiences (Wilke, 2004). One basis for assessing science practice teachers' performance in the new normal is their reflective experiences in the portfolio. Reflective practices and activities written in their portfolio enable teachers to reflect on their teaching experiences and to question their experiences with a critical approach (Amobi, 2005; Murray, 2010). It is through reflecting on one's experiences that a person can understand and transform his experiences into knowledge (Baker et al., 2002). Written reflections on their experiences in their portfolio serve as a basis for assessing their performance. (Granello, 2022). However, experience alone does not produce knowledge; it is through thinking about the experience that one gains knowledge (Dewey, 1910/1986).

Few studies provided comprehensive data on the difficulties, coping, and implication of reflective experiences of preservice science teachers written on their portfolios as the basis for assessment. Specifically, during the COVID-19 pandemic, teacher interns depend most on the Supervising Teacher Educators (STEs) for the feedback and assessment of their performance during their practicum. However, the narratives they have written in the portfolio allow them to self-reflect and analyze their strength and weaknesses. Most significantly, their learning comes from their reflections on the actual classroom experiences and other practicum-related tasks, either teaching or non-teaching.

Statement of the Problem

In this sense, the study is conducted to examine how classroom teaching, learning process, and practices improve when preservice science teachers are provided with the opportunity to reflect on their science teaching-learning experiences. It is also one way to know how experiences during the practicum have produced the necessary knowledge and skills.

Specifically, this study seeks to answer the following questions:

1. What difficulties do science preservice teachers encounter regarding their reflective experiences as the basis for assessment?
2. How do science preservice teachers cope with these difficulties?
3. What is the implication on the science preservice teachers of their reflective experiences as the basis for assessment?

Review of Literature

Teaching Difficulties Encountered During the New Normal

Teaching during the pandemic is different and an unprecedented experience for all teachers and students (Al Abiky, 2021). This eventually led to stress and uncertainty regarding teaching and learning for teachers and students. (Kafka, 2020; Zhai & Du, 2020). Commonly identified difficulties focus on the internet connection, which could be more stable and available to all teachers and students. As Agung et al., 2020 emphasized, teachers' teaching performance was affected by limited internet connection. Supported in the report of Cullinan et al. (2021), internet connectivity issues are faced not only by preservice teachers but almost all students and teachers in various higher education institutions. It also highlights the impact of geographic location on internet connectivity. This boils down to preservice teachers' inadequate technological tools used in online classes and their technicalities. Al Abiky (2021) mentioned, many preservice teachers in different schools, districts, and colleges should understand the nature and requirements of online teaching and remote learning. As a response, different ways of observation tools came up. In the study of Kilic (2022), Reformed Teaching Observation Protocol (RTOP) and Technology Integration Observation Instrument (TIOI) were used. The observation form serves as the protocol in the conduct of research to explore preservice teachers' classroom practice levels (Park et al., 2011). Thus, technology literacy would change the learning process at all levels (Jung & Latchem, 2011). In addition, assessment and evaluation types and procedures used during online teaching were considered a big challenge (Al Abiky, 2021). For instance, Barnes et al. (2020) found that Saudi Arabian schools and universities encountered difficulties in proctoring tests. This can be considered an underdevelopment in assessment and evaluation (Timmis et al., 2015).

Coping Strategies in the Teaching-Learning Process

In light of these difficulties, science pre-service teachers employed various strategies to cope with the difficulties experienced. Shoffner (2009) identified three coping mechanisms using multimedia: electronic mail (email), discussion boards, and weblogs. He explained that the interaction facilitated by emails could increase discussion and questioning among pre-service teachers as new ideas are introduced, and old ones are extended. He further discussed that weblogs bring differences in use, application, and intention to the reflective process when contrasted with more traditional paper reflective journals. Moreover, Mayer (2002) created online discussion boards to support pre-service teachers' interaction with students, which helps student participation in terms of flexibility of time and place as they could not be physically present in a classroom. Bull, Bull, and Kajder (2003) used weblogs as reflective journals for pre-service teachers in a technology course that is more structured than emails and focused than discussion boards. Their study found that pre-service teachers could extend their reflective thinking with multimedia links and embedded objects in the study. Aside from multimedia, Baloran & Hernan (2020) also emphasized the need to train preservice teachers on classroom and time management skills and resiliency to face unexpected school challenges effectively.

Implications of Reflective Experiences

Experience with reflection during teacher preparation also supports preservice teachers as they construct the personal knowledge needed to guide their teaching and learning decisions. Teacher educators seek to provide preservice teachers with a range of reflective experiences, drawing on their understanding of reflection's potential benefits for preservice and practicing teachers' development. (Shoffner, 2009). Self-assessment will do to reflect on the difficulties encountered and needed interventions. This can be done by employing varied techniques to improve their teaching and ability to effectively identify and react to students' problems (Mathew et al., 2017). Preservice teachers who learned to develop and refine knowledge through reflection were more likely to benefit as practicing teachers from reflective thinking: maintaining an awareness of personal beliefs and actions, recognizing the many influences on student learning, and drawing links between theoretical issues and everyday practice (Liston & Zeichner, 1990; Loughran, 2002; Ward & McCotter, 2004). As support for such growth and development, teacher educators must work with preservice teachers "to reflect on their practice in meaningful ways, to consider the effect their teaching has on student learning, and develop habits that will stay with them" (Ward & McCotter, 2004) as they emerge from teacher preparation and move into their classrooms. Consequently, teacher preparation provides opportunities for preservice teachers' development, offering various education-based experiences while challenging personal views on teaching and learning, often through engagement with reflective practice (Kadir & Aziz, 2021). Thus, given the difficulties experienced and the coping mechanisms utilized by preservice teachers, reflective thinking allows them to examine their beliefs, practices, and the implication of self-reflection toward their personal growth and development.

Theoretical Framework

The experiential Education theory of Dewey (1910/1986) explained that experience alone does not produce knowledge. It is through the process of thinking about the experience and reflection that learning takes place. (Grant, 2006).

Experiential Learning Cycle Theory of Kolb (1984). This involves four steps: doing, reflecting, generalizing, and transferring. Here, following the steps of the cycle, practice teachers were able to get the implications of the process on how they learn by reflecting on their experiences in their portfolios.

The Cognitive Motivational Relation Theory of Lazarus and Folkman (1993) describes how science teachers cope through reflection on the different experiences during their practicum.

Methodology

Research Design

This descriptive single-case study determines a particular case in real life. It is a thorough and contextualized empirical investigation of a current occurrence, such as difficulties, coping, and implications (Yin, 2009). Specifically, it gives a detailed description of the different reflective experiences of science preservice teachers in the different phases of their practicum. As Creswell (2014) explains, case studies are studies in which a researcher tries to provide an in-depth examination of the investigated case.

Research Participants

The study participants were ten BSED-Science Preservice Teachers deployed for the First Semester of SY 2022-2023 in the laboratory school of one of the Universities in Leyte, Philippines. The consent form and availability of the participants were considered before the conduct of the Focus Group Discussion. Pseudonyms were used in the transcript. The utmost confidentiality of information and audio recordings was observed.

Sampling Procedure

Purposive sampling was used to determine the participants of the study. This includes selecting a group of teacher interns from the same course, group, and class assignment. Participants were selected according to their common field of interest and experiences since they were all science majors assigned to the Junior High School.

Research Instrument

The study utilized a researcher-made interview questionnaire in the in-depth interview and focus group discussion to gather data. It is composed of open-ended questions to extract the responses of the participants relative to the difficulties, coping mechanisms, and implications of their experiences on their practicum performance. The interview guide was validated first before it was fielded to the participants. The instrument is divided into two parts- Part 1 aims to gather information on the participants' basic information such as names, ages, courses, and grade level. Part 11 was about the difficulties, coping, and its implication on the performance of preservice teachers.

Data Collection Procedure

The researcher submitted the instrument for evaluation by experts and had it pilot-tested for validity. Purpose of the study was explained together with the consent form. The researcher set the agreed place, date, and time of face-to-face interviews according to the participant's availability. The said process allows the researcher to elicit more in-depth responses and clarification when the participant does not understand the question (Olson & Muise, 2009). Audio-recorded interviews were transcribed and shown to participants for review (Yamagata-Lynch, 2010), then proceeded to qualitative data analysis based on the emerging themes.

Data Analysis

Data gathered were analyzed using the thematic analysis of Braun and Clarke (2006) with the following steps: (1) familiarization of the data, wherein transcribed responses during the interview, create familiarization with the data by reading and rereading the transcription; (2) generating initial code for each transcript; (3) searching for themes through examining the initial code and critical points that form potential themes; (4) reviewing themes, to ensure the alignment of the theme with the significant codes in the data; (5) defining and naming themes, this is to confirm the selected themes and its code; (6) producing the report with precise alignment of the theme to the research questions and existing literature.

Results and Discussion

Difficulties Encountered on Reflective Experiences

Theme 1: Unstable Internet Connectivity

An unstable internet connection is one factor that poses a challenge to online teaching (Tsitsiani et al., 2020). This is the daily struggle of preservice teachers who must search for teaching materials and aim to deliver their lessons online effectively. As Smyth et al. (2012) mentioned, delayed feedback from teachers and poor internet connectivity were viewed as the two most significant drawbacks causing delayed submission of tasks and access to online resources.

Significant Response 1: "The internet connection is unstable, so I cannot access the online resources I needed for my demo teaching on protein synthesis."

Significant Response 2: "We are in the middle of a discussion, and my students need my feedback on their activity and there is a sudden loss of internet connection".

Theme 2. Classroom Management

Preservice teachers need help with online teaching during the pandemic focusing on handling the class to listen, participate and hold their attention since there is no live interaction. One of the challenges of online teaching practicum was the need for 'live' communication between preservice teachers and students (Sepulveda-Escobar et al., 2020). Lack of interaction is a massive disadvantage of online lessons (Özkanal et al., 2020).

Significant Statement 1: "The students are not responding to my questions, as if I am the only one in the google meet."

Significant Statement 2: "I am unsure if all my students are listening to my lecture since their camera is off."

Theme 3. Lack of knowledge of Technology Integration in Teaching

Preservice teachers also need help with technological integration and material preparation as they need more experience and expertise in utilizing technology and digital materials (Ersin et al., 2020). Materials play a significant role in the success of online education (Özkanal et al., 2020). Due to a lack of knowledge, some preservice teachers could not engage their audience with the materials they prepared, wherein the activities were not transformed in such a way that they would be suitable for online teaching and learning (Evagorou & Nisiforou, 2020).

Significant Statement 1: "It is tough to teach online since I have no laptop. I have to go to an internet shop to prepare my online teaching."

Significant Statement 2: "I want to make my lessons interesting, but I do not know how to integrate the new technology into my lesson."

Theme 4 : Inability to submit tasks on time

Submitting tasks on or before a set deadline is an essential trait of a preservice teacher. Participants of the study expressed that time management is one of their concerns, especially if they are bombarded with many tasks and workloads. Liao & Vavrina (2020) identified workload as a significant issue among preservice teachers. This is the scenario during practicum, wherein the Supervising Teacher Educator (STE) is also a class adviser and handles other organizations. As part of practicum training, the preservice teacher will assist with the tasks and responsibilities of the STE.

Significant Statement 1: "I failed to submit my lesson plan on the given deadline since I was attending the meeting as an officer of the Senior Class Organization."

Significant Statement 2: "I do not know what to prioritize, preparing my demo teaching or helping my STE in the school activity."

Coping Mechanism

Theme 1. Positive Disposition

Positive disposition give good effect to every individual. The importance of events or situations to an individual significantly impacts creating a positive outcome and behavior (Fuochi & Voci, 2020). Students with a positive personal outlook, including an optimistic view of life, are more likely to deal with school obstacles successfully. (Kato, 2015). Teaching in the new normal, preservice teachers must deal with uncontrollable situations in which self-adjustment will bring resourcefulness (Davis, 2018).

Significant Statement 1. "Instead of worrying about the internet connection, I make use of my time organizing the concepts of my demo teaching."

Significant Statement 2. "I borrowed a laptop from my classmate when she was done with her work."

Theme 2. Interactive Lessons

Preservice science teachers found out that teaching science online has less student participation. The pandemic made them explore online interactive activities to engage students more in the lesson. This enables the preservice teachers to be flexible and deliver lessons online with less difficulty (Dziuban et al., 2018).

Significant Statement 1: "I used inter-active games in my lesson. My students actively participate, and the class is lively".

Significant Statement 2: "I let them do science blog and tiktok applying the science concepts of the lesson. My students volunteered to be part of the activity".

Theme 3. Technology-integration

Despite the pandemic, preservice teachers demonstrated initiative and resilience. It also describes the adjustment to the shortage of digital technology resources and uses what is doable (Rwodzi, 2018). Technologies (slide/presentation, video, etc.) used by pre-service teachers in pre-classroom practices were partially compatible with the lesson's learning outcomes. In addition, video recordings of the lessons were kept to be able to watch and examine them repeatedly. (Kilic, 2022)

Significant Statement 1. " I tried the video on the process of protein synthesis, and students were amazed; they could understand the concept well."

Significant Statement 2: "We did a simulation in one of the science activities, and students enjoyed and actively participated."

Implication

Teaching and learning experiences as reflected in the portfolio plays a great role in the assessment of pre-service teachers performance throughout their practicum. It sharpened their ability to reflect while they are working on the different shifts of their practicum. As stressed by Barrends,et.al(2023),students reflections of their experiences through portfolio enhance the process of critical thinking and learning. Mind-shift is needed on the alternative use of portfolio in teaching education program for sustainable assessment. This is further explained by Nagro et.al.,(2020),that the main goal of reflective practice is to revise instruction that can better cater students needs and promote growth in the teaching profession.

Theme1. Learning while Working

Significant Statement 1: "We were able to learn while writing our reflections and narratives of our experiences during our practicum."

Significant Statement 2: "Working on our portfolio is time-consuming, but through the documentation in it, I was able to self-reflect on what should be done and not and the learning gain,retain in my heart and mind."

Theme 2. Experience is the Best Teacher

Significant Statement 1." The teaching experiences contained in our portfolio made us understand how to develop and improve our teaching practices."

Significant Statement 2: "Working on our portfolio made us recall the different phases of our practicum and the application of the theories to actual teaching."

Theme 3. Assessment of where we are

Significant Statement 1: "The seven domains in our portfolio help us assess our strengths and weaknesses as practice teachers."

Significant Statement 2: The narratives containing our reflection in the portfolio help us think about how to improve our teaching strategies and deal with students.

CONCLUSION

Reflection of practicum experiences and challenges offer opportunity to pre-service teachers to learn and how to cope with those challenges. It open a new perspective of the need for preservice teachers to adapt instructional approaches that will prepare them for pandemic similar situation in the future (Hill,2021).

Based on the findings, this study pointed out the role of day-to-day experiences in the wholesome development of pre-service teachers. These reflective experiences of science pre-service teachers written in their portfolio consist of their experiences, difficulties, how they overcome those difficulties, achievements, and implications.

As a basis for assessing their performance, these reflective tools help them reflect on their strengths and weaknesses, analyze and assess where they are, and how to improve their performance to become effective and efficient preservice teachers.

RECOMMENDATIONS

It is recommended that practicum coordinators should emphasize to the preservice teachers the role of reflective experiences in their professional development. School heads will revisit the curriculum and consider offering experiential education, which will advocate using experiences and reflection to promote learning to preservice teachers and all students.

Moreover, professional and trained peer counselors may assist the practice teachers in analyzing their reflective activities. Further studies maybe conducted to see other possible indicators of the self reflective experiences in the portfolio as tool to assess pre-service teachers performance.

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