RESEARCH ARTICLE

Beginning science teachers' online classes: A narrative inquiry

Jleian Mard M. Loseñara [a,1,*], Catherine P. Loseñara [b,2]

[a] College of Arts and Sciences, Cebu Technological University, M.J. Cuenco Avenue corner R. Palma Street, Cebu City, Cebu, Philippines

[b] College of Technology, Cebu Technological University, M.J. Cuenco Avenue corner R. Palma Street, Cebu City, Cebu, Philippines

[1] jleianmard.losenara@ctu.edu.ph*; [2] catherine.losenara@ctu.edu.ph

Abstract: With the unprecedented shift to online or flexible learning modes, both teachers and students adapt to the new normal of education. A qualitative study aimed to draw out the voices of three beginning science teachers, the study utilized the narrative inquiry approach through in-depth interviews. It was found that beginning science teachers are faced with challenges: transitioning to the actual teaching practice and adjusting to the new normal in education. Beginning science teachers voiced out their challenges, including adapting to the culture of the new generation of students, access to a stable internet connection, problems with technology use, and teaching-learning process adjustments. Coping strategies include creative and responsive adjustments to teaching-learning, assessment of learning, learning mode, and internet connection problems and online platforms. Their stories serve as a springboard for interventions that guide and assist beginning teachers.

Keywords: narrative inquiry; online classes; science teachers; science education

For correspondence:
jleianmard.losenara@ctu.edu.ph

Article history:
Received: 17 January 2024
Revised: 26 January 2024
Accepted: 3 February 2024
Published: 6 February 2024

10.22219/jpbi.v10i1.31800

p-ISSN: 2442-3750
e-ISSN: 2537-6204

How to cite:
Loseñara, J. M. M. & Loseñara, C. P. (2024). Beginning science teachers' online class: A narrative inquiry. *JPBI (Jurnal Pendidikan Biologi Indonesia), 10*(1), 47-57. https://doi.org/10.22219/jpbi.v10i1.31800

Introduction

The pandemic has caused an imbalance, especially in opinions regarding education (Hart, 2020) and differences in the education system have widened. When the COVID-19 pandemic threatened most countries, which has disrupted essential activities resulting to challenges in learning (Khoirudin et al., 2021), academic institutions have resorted to online classes. The pandemic necessitated a swift transition from face-to-face to online learning modes (Camargo et al., 2020). Teaching and learning have adopted a new platform, the online world. Online education is growing rapidly and has increased the last two decades (Martin et al., 2020). Online learning has been the successful mode to carry out instructional activities and avoid the potential loss of learning (Paudel, 2020). Online or flexible learning is the new normal in education. It is therefore essential for all the individuals in the educational field to be able adjust to changes (Singh, 2019). Because the learning mode is new, students and teachers are inevitably learning to manipulate, navigate and adapt to the new normal (Commission on Higher Education, 2020). As teachers who are already in the academe are working to adapt to the new normal in education, the beginning teachers or first-time teachers, or those new to actual teaching, are faced with two new environments: to adapt to teaching and online teaching.

Several studies show that beginning teachers face challenges in the early stage of the profession. During the early phase of their teaching, beginning teachers perceive the need to develop their effectiveness (Mok et al., 2023). Transitions between roles that entail learning new tasks, assuming new responsibilities, and meeting new accountability expectations are difficult times for those involved. This is the case when teachers first go into the profession and make the challenging shift from pre-service

novice teachers to fully responsible teachers in schools (B. Johnson et al., 2014). Teachers must master the concepts to effectively deliver instruction (Maryuningsih et al., 2022). However, they must also face the challenge of adopting to online teaching as this may influence teachers' perceived teaching effectiveness, an essential component of effective teaching-learning (Ahmed et al., 2022). Beginning teachers may see online teaching as preferable because limiting factors in physical face-to-face teaching, such as daily financial expenses for transportation, food, and learning materials that must be purchased will no longer compete for students' attention and will not demotivate them. However, students, parents, and teachers are not equipped with gadgets not considered necessary for daily subsistence. While the appropriate use of online tools is beneficial to students' learning experiences, access to stable internet connection may impede learning (Peimani & Kamalipour, 2021).

The Philippines has one of the lowest internet connectivity in Southeast Asia (Department of Information and Communications Technology, 2020). Not all parts of the country have been reached by cellular networks, especially far-flung or mountainous areas. In schools in the provinces, students and teachers live in areas distant from the town centers where they have limited access to the internet, in addition to financial constraints to afford such. A barrier to online learning is access to stable internet connection (Fabito et al., 2021). This pose a challenge not just to students but teachers as well (Asio et al., 2021) especially beginning teachers who are still in the adjustment phase of the teaching profession. Old and new teachers see the availability of Information Communication Technology (ICT) resources as a challenge to online teaching-learning. Many teachers are not adept at using online platforms including beginning teachers who have yet to adapt to actual and online teaching.

Knowledge of the problems faced by beginning teachers in their first years of teaching may provide important information for the improvement and redesigning of preservice and in-service programmes (Cerkez, 2020). According to a study by Tondeur et al (2017), research also indicates that beginning teachers make little or no use of technology in their instructional practice. Online education programs can be better implemented if leaders of the academe are able to understand faculty, perceptions and challenges in delivering education online (Wingo et al., 2017). There is therefore a need to look into how beginning science teachers perceive online teaching.

The Philippine Professional Standards for Teachers (PPST) guides beginning teachers with standards expected of transitioning novice teachers. The PPST expresses standards that guide teacher quality, especially in response to reforms brought about by the K to 12 transition. This set of standards explicitly defines and enumerates what teachers should know, nurture competence, improve student learning, and thus quality education (Department of Education - Teacher Education Council, 2017). The professional standards identify the attributes that a teacher must possess to competently adopt in 21st-century education (Jorilla & Bual, 2021). The PPST domains included a comprehensive competency that ensured the use of globally-best teaching methods (Malunes & Dioso, 2020). Of the seven domains in the PPST that guide teachers in the various developmental professional stages, domain 4 addresses teachers' knowledge of and interaction with curriculum requirements. Strand 5 of this domain, tagged as Teaching and learning resources including ICT, makes it explicit that beginning teachers are expected to show skills in selecting, developing, and using various teaching and learning resources, including ICT, to address learning goals (Department of Education - Teacher Education Council, 2017).

Proposed by Jack Mezirow, the Transformative Learning Theory (TLT) provides that teachers are learners too, adult learners (Wolff, 2022) and learn from the situation and transform such by finding creative strategies to enable learning. TLT is a learning process of constructing and appropriating new and revised interpretations of the meaning of an experience in the world (Schnepfleitner & Ferreira, 2021). Further, Van Schalkwyk et al (2019) referred to TLT as 'learning that transforms problematic frames of reference—sets of fixed assumptions and expectations to make them more inclusive, discriminating, open, reflective, and emotionally able to change. From the discoveries grounded on the participants' responses, challenges of beginning science teachers, coping strategies, and creative responses in response to the new normal of education are sought.

This study aimed to draw out the voices of beginning teachers' coping strategies in teaching science in the new normal. Specifically, it aimed to identify the challenges of beginning teachers in addressing Domain 4, Strand 5 (Curriculum and Planning: Teaching and learning resources including ICT) of the PPST. Also, it intended to draw out stories of how beginning teachers cope with the challenges encountered in addressing Domain 4, Strand 5 of the PPST.

The central purpose of this study is to amplify the voices of beginning science teachers so that the

challenges they encounter and battle with could provide essential information and ideas to other beginning teachers. The challenges encountered by the beginning science teachers could enlighten science teachers and other science teachers. Additionally, the creative and adaptive responses of the beginning science teachers could inspire other new teachers and provide ideas that could guide other new teachers.

Method

This study was realized utilizing a qualitative research design, specifically the narrative inquiry approach. Interviews with beginning science teachers were conducted to draw out the voices of the beginning science teachers. As described in Clandinin (2008), narrative inquiry is first and foremost a way of understanding experience allowing for a view of the phenomena of people's experiences. It is a method for inquiring narratively into an experience that provides for the intimate study of individuals' experiences in context and over time. Narrative inquiry is a well-suited methodology with the possibility of gathering rich data of personal experiences (Haydon et al., 2018). Human beings both live and tell stories about their living which are ways we create meaning in our lives and ways we enjoin each other's help in developing our lives and communities (Clandinin, 2008).

The essential step that enabled the researcher to build an inquiring relationship with the study participants was by establishing rapport. The researcher made initial visits and conversations with the beginning science teachers. Common methods used are interviews and conversations or interviews as conversations. Narrative inquiry and its relational properties allow both researcher and participant to engage and thus establish connections; therefore, a deeper understanding of the phenomena under investigation is created (Haydon et al., 2018).

After permission from the campus director was sought, initial interviews were done to identify study participants and establish rapport. Informed consent was secured from every study participant to ascertain that they agreed to participate voluntarily. Participants were asked their preferred online platforms where the interviews would be conducted. The study participants' username or user ID in their preferred social media platform were asked to allow the researcher to reach out and establish communication. The researcher and participants then set schedules for the interview. A series of interviews and follow-up interviews were conducted.

Because of the restrictions enforced in response to the current pandemic, face-to-face encounters are strictly prohibited. Therefore, interviews were conducted virtually. Interviews were conducted through Facebook Messenger based on the availability of the participants and primarily upon their preference to allow a conducive atmosphere for the participants to tell their stories. Through the interviews, the beginning science teachers were allowed to identify and talk about the challenges they encountered as they transitioned to the actual teaching practice and adapted to the new normal in education. Follow-up interviews were conducted. The responses of the study participants were then reviewed, consolidated, and thematized through axial coding.

The study participants were beginning science teachers affiliated with a state university in Cebu. There were three beginning science teachers during the study. Specifically, one new Biology teacher was from the College of Arts and Sciences and two from the College of Agriculture teaching life sciences. All three teachers were females and were in their early to mid-twenties age.

In interviews, open-ended questions were utilized in consonance with the study objectives. Interview questions revolved around the challenges faced by the beginning science teachers and their coping strategies. The questions included but were not limited to how the beginning science teachers transitioned to the actual teaching practice and how they adapted and adjusted to the new normal in education. There was a free flow of question-and-answer where the researcher probed further into the challenges and coping strategies of the beginning science teachers based on the responses provided. Follow-up questions were asked for clarification and the provision of additional information to build a clearer picture.

As necessary data were gathered through the interviews, the narrative inquiry process began with the researcher inquiring into his own experience and continually reflecting on his own stories. Hence, the reflexive process is ongoing in the conduct of narrative inquiry. The participants are considered the most influential voice in this narrative inquiry undertaking, and therefore ethical considerations were valued. The study's data are composed of participants' responses from conversations, interviews, and answers.

The participants' responses were transcribed from the preferred social media platform where the interviews were conducted. In Facebook Messenger, the researcher went through the responses a couple of times, searching for frequently recurring or common words that represent themes essential in achieving the purpose of the study. In forming research texts, the researcher looked into the participants' responses while actively reflecting on his own stories of experience.

After repeatedly reading and reflecting on the research texts negotiated between researcher and participants, the researcher coded the data. Raw data from interviews were broken down to identify and label ideas and answers that set the stage for axial coding that allowed the researcher to identify relationships. Through axial coding, the researcher established concepts and common categories that were further refined through a three-phased axial coding with the researcher's ongoing reflection. The researcher thematized and coded the responses for analysis and interpretation. Before interpretation, the axial coding and thematization processes results were returned and presented to the study participants to validate the generated findings. In addition, this step allowed for participants to provide additional ideas and concepts.

Results and Discussion

The Challenges of Beginning Science Teachers

Based on the responses provided from the interviews with beginning Science teachers, the significant and repeated word "lisod", which translates to difficult, is commonly and frequently used by the interviewees to refer to the situations that present to be challenging for them in the conduct of their teaching. The beginning teachers considered four situations that are 'lisod' for them and are thus considered challenges. The challenges encountered by beginning science teachers in the new normal of education include difficulty adjusting to the culture of the new generation of students, internet connection, technology use, and teaching-learning.

Kabatan-onang Kultura (culture of the new generation of students)

As teachers adapt to the new normal in education, beginning science teachers are prompted to adjust to the new normal and the teaching practice. According to R. O. Johnson (2013), shifting and adapting to the world of teaching from being a pre-service teacher is challenging. In addition, Zukas (2011) discussed that transitions between professional roles involving learning new tasks, assuming new responsibilities, and meeting new accountability standards and expectations are challenging times.

As evident in the responses of the beginning science teachers, one of the challenges they have encountered in their transition to the actual teaching practice is their adjustment to the culture in the new generation of students seen in the following responses:

> *"I have observed that sometimes students tend to be disrespectful to me because they know that I am a new, powerless instructor." (Teacher 3)*
> *"What is most challenging for me is really dealing with the culture of the students." (Teacher 1)*

Internet Connection

Now more than ever, the internet plays a crucial role in the pursuit of education. Internet use to improve educational achievement has rapidly increased (Harahap, 2019). Nowadays, internet usage unavoidably must be integrated into the higher education system. As cited by the Philippine Department of Information (Yustina et al., 2020), around 1 to 4 Mbps, while standard definition and high-definition video streaming are around 3 to 4 Mbps and 5 to 8 Mbps, respectively, based on online tech reviews (Department of Information and Communications Technology, 2020). Further, the DICT stated that although data statistics claim that the Philippine internet has improved, the DICT said it could do better. Areas that are far from city or town center still struggle for stable and fast internet connection.

From the interviews, another challenge faced by beginning science teachers is the availability of access to internet connection, not to mention the connection speed. The participants struggle to access their virtual classrooms or platforms, especially in uploading and retrieving materials. In addition, they worry if the students can access the online/virtual classroom due to constraints in the internet connection. The

following responses show how the participants struggle with internet connection:

> *"Buying load so that we can have data (internet connection) is very expensive." (Teacher 1)*
> *"Even viewing a video, the internet connection is (very) loading (slow)." (Teacher 1)*
> *"We always spend money to buy load for internet connection. (Teacher 2)*

The following responses are evidence that teachers also find it challenging to think if students have access to an internet connection:

> *"Our students struggle because they don't have the right devices nor internet connection." (Teacher 3)*
> *"(Gadget) is another problem: there is one student who always chats (messages me in Facebook messenger) in the wee hours of the morning because that's the only time he/she could borrow his/her father's cellphone." (Teacher 1)*

"Gamit" Sa Technology (Use of Technology)

The conditions that require the learning process to be carried out remotely or online, of course, technology's role is vital (Yustina et al., 2020). Unfortunately, not everyone is computer or internet-literate. Thus, based on the interviews, beginning science teachers find it challenging to deal with students who appear to have difficulty manipulating or navigating the internet or online platforms. In addition to such deficiency in ICT skills, many students do not own computers or even cellular phones, which are the vessel of online learning. Thus, these are considered challenges for both teachers and students. Seen in the following responses, it is evident that teachers find it challenging to reach out to all students, especially if students are struggling with technology use:

> *"Teachers shouldn't demand (for students to buy gadgets/devices) because we are in a pandemic, for all we know, they (students) struggle for food or subsistence for the family, except for those who can afford to buy gadgets." (Teacher 2)*
> *"The video should not be lengthy (duration is short) so that they (students) can easily download it because there are cellphones who have low memory storage." (Teacher 1)*
> *"Not all students know how to use the computer or any other software application. (Teacher 2)*
> *"Some students struggle in using social media, even in the use of the google classroom." (Teacher 3)*

Teaching-Learning

The shift of education from face-to-face is not just a technical challenge but also an instructional and pedagogical issue (Yustina et al., 2020). In addition to delivering instruction, teaching in the new normal demands to be creative that learning is encouraged despite the current circumstance. Harahap (2019) stated that one of the teacher's responsibilities is to create a learning environment that concerns the students' science process skills.

Beginning science teachers are challenged with adapting to the new normal in education while hurdling the transitioning process into the world of teaching as exemplified by their responses:

> "*I haven't earned education units that's why I am not confident with the (references and pedagogical content knowledge) resources." (Teacher 3)*
> *"Teaching (science) is difficult because there are laboratory activities which should not be performed by the students at home." (Teacher 1)*
> *"There is a question of the right way to evaluate students learning, if they have truly understood the topic presented." (Teacher 2)*

Creative Responses to the New Normal: Resiliency

Teacher resiliency, considered an essential factor in classroom success, is the ability to adapt to various

situations while enhancing one's competence to cope with unpleasant happenings. Utilizing their resources in informing their perspective and decision-making, adjusting to adverse or negative situations must be learned for an individual to be resilient. Teaching-learning must continue in the new normal of education, prompting teachers to be resilient in providing quality education while being constrained by the pandemic by being resourceful and creative in coping with challenges. Based on the data gathered, beginning science teachers adjust five identified aspects of their teaching: teaching-learning, evaluation and assessment of learning, learning mode, internet, and online platforms. An essential element in resiliency is resourcefulness which is the capability of moving beyond the previous status quo to recognize new problems, set priorities, and marshal resources (Donnelly, 2020).

Teaching-Learning

The pandemic has undeniably presented reforms in the delivery of teaching-learning in response to restrictions. Aside from delivering instruction, teaching in the new normal demands to be creative so that learning is encouraged despite the current circumstance. Anchored on the responses of beginning science teachers, it was revealed that the typical teaching-learning resort is the use of videos to alternatively present the lessons in a manner accessible to learners at their capability. A whole class hour may be recorded as previews, short presentations about a specific topic, or information (Kay, 2012). Beginning science teachers incorporated the videos to supplement discussions and thus enhance learning, especially because some aspects of teaching science, such as terminologies or procedures, are better understood when visually presented or demonstrated. The following responses show how the participants respond to this challenge:

> *"I will just be straightforward (in dealing with students who tend to be disrespectful)." (Teacher 3)*
> *"I provide additional information on a certain topic by including them in my video discussion, I incorporate Youtube videos in my video discussion (as additional online resources)." (Teacher 1)*
> *"I will be the one to conduct other laboratory exercises. For laboratory exercises that are to be performed by the students, I give them a procedure guide." (Teacher 2)*
> *"(I will perform the laboratory activity) and I will take a video while I conduct the laboratory exercise. After which, I share the recorded with the students." (Teacher 1)*

In response to the rapid increase in access to the internet and internet-based communications, videos are used as educational tools (Tan & Towndrow, 2009). According to Pekdağ (2010), using videos in teaching-learning environments is effective in three aspects: providing cognitive benefits, psychological benefits, and visualization of knowledge. In a review of studies on the educational use of videos by Kosterelioglu (2016), it was shown that using video or other multimedia materials in the teaching-learning process increases learning.

Assessment of Learning

Assessment provides a measure of the achievement of course learning outcomes of the learners and is thus inarguably an essential part of teaching and learning (Khan & Jawaid, 2020). Because of the pandemic, issues of validity, reliability, and dishonesty might be of concern. Responses from the interviews imply that the teachers tend to adjust to the current circumstance, primarily based on student access to the internet and gadgets limitations. The interview revealed that teachers do not provide simple recall or objective assessments because of constraints on the internet. Teachers resort to oral exams requiring students to utilize higher-order thinking skills encapsulating their insights. However, when such assessment is not possible, teachers opt to provide timed yet scheduled assessments to allow access to all students by providing them ample time to prepare and secure stable internet connections and gadgets. Assessment of learning in the online mode is undeniably challenging compared to the face-to-face setting. As seen in the responses below, the teachers resort to ways of assessment:

> *"For the assessment, I give them questions and I let the students answer asynchronously so they can access my class anytime. However, I set a deadline." (Teacher 1)*
> *"Activities are adjusted because some students only have cellphones used in doing the*

activities. So, deadlines are also adjusted because its very costly to buy load for data (internet connection)." (Teacher 3)

"(Students inform me that) that they have submitted their ouptuts, but when I check, there are no attachments. Some have difficulty in sending through gmai, (so) I give them a consideration. I allow them to hand-write and take a picture of it. Then, I guide them in how to send the picture of their document." (Teacher 2)

"In one of my subjects, specifically Practice in Crop Production, because students don't ask question, I let the students perform all the practices I've discussed. Aside from performing, they also need to submit a written report." (Teacher 1)

Learning Mode

Learning must be designed with multiliteracy pedagogical planning and have various competencies including mastering ICT for access to information, communication, delivering information (Holloway & Gouthro, 2020). According to the data provided by the beginning science teachers, to reach and accommodate students, considering that all have no easy access to internet and gadgets, they employ asynchronous modes of learning in alternate with the synchronous meetings, known as the hybrid method (Danjou, 2020). The asynchronous part is achieved by the teacher uploading videos and other learning materials on online platforms.

Based on the responses, the participants used different modes of learning to enhance learning. The following responses reflect the strategies of the participants:

"I prepare PowerPoint presentations which I send to student's in advance, (before the synchronous meeting". (Teacher 1)

"I plot my classes weekly (so I can schedule at least one synchronous class." (Teacher 3)

"(Most of my discussions) are asynchronous so that they can access my class anytime." (Teacher 2)

"I schedule synchronous class beforehand so that students could allocate time and mobile data for it." (Teacher 3)

Internet

Now more than ever, the internet plays a crucial role in the pursuit of education. Internet usage unavoidably must be integrated into higher education system. The DICT stated that although data statistics claim that Philippine internet has improved, the DICT said it could do better. As students battle for internet connection to access learning materials, beginning science teachers also struggle for the internet to deliver instruction, based on the interviews. It was found that the beginning science teachers addressed internet challenges by looking for and going to areas within the campus that have stable internet connections, sacrificing their convenience and comfort. Yustina et al (2020) stated that some individuals have to go to great lengths to look for signals on the mountain, summit, and some even climb. In response to the challenge of having internet access, beginning science teachers identified how they coped with the situation as illustrated by the following responses:

"During school hours, we go down near the College of Education building (to connect to the free wifi). We have gotten used to this." (Teacher 2)

"We go to the school in the evening for us to connect to the school's free wifi." (Teacher 1)

Online Platforms

Despite the university having an official online platform intended for flexible education, teachers and students state that the platform is still not fully developed. Because some students do not have adequate ICT skills, some teachers prefer not to use the official platform to accommodate all students. Based on their responses, it is evident that the teachers consider preferred platforms that are accessible to majority of their students, as evident below:

"I let them use google forms since it is mobile friendly compared to Microsoft word, powerpoint etc. (Teacher 3)"

"Since the university's online platform is not fully developed and since some students do have their school email accounts yet, what I did was to look for a way to have a formal class, I used Google classroom so that everything is organized. Students can reach the topic there. It's also

where I upload my video discussions, assignments, quizzes and also attendance. In addition to Google classroom, I also made a private Facebook page and a group chat in Facebook Messenger." (Teacher 2)
"I prefer to use messenger room or google so that lesser data would be consumed compared to Zoom. I don't let them do assignments using microsoft programs." (Teacher 3)

Among teachers in different stages of the teaching career, a study by Keller-Schneider et al (2020) revealed that beginning teachers had the lowest competence in four essential areas of teaching. Based on results of the study, it is found that beginning science teachers have difficulty adapting to the new normal and transitioning to the actual teaching practice. Beginning science teachers struggle with some difficulties, including adapting to the culture of the new generation of students, access to a stable internet connection, problems with technology use, and adjustments in the teaching-learning process. Beginning science teachers, considering they come from different schools and thus a different culture, are faced with the differences in the culture of the students. A study by du Plessis et al (2020) revealed that regardless of their age, gender, teaching experience, qualifications, or initial teacher education, beginning teachers identified that their teacher education training was different from the reality of the field.

In the Philippines, especially in areas far from town centers, both teachers and students are challenged to access a stable internet connection because some areas have no network signal. Purchasing mobile load for internet data is an additional expense. The study revealed that though beginning science teachers possess ICT skills on technology use, the challenge is on the students' part. It was revealed that not all students have gadgets, whereas some students cannot use technology such as online platforms correctly. It was also revealed that a challenge encountered by the beginning science teachers is the major adjustments demanded by online/ flexible learning. This includes limited access to a stable internet connection, lack of gadgets/ devices for online learning, and deficient skills to use online platforms or applications.

During the global crisis, beginning teachers faced unanticipated challenges prompting them to find creative opportunities (Dvir & Schatz-Oppenheimer, 2020). The findings revealed creative and resilient coping strategies of beginning science teachers in response to the challenges including creative and responsive adjustments to teaching-learning, assessment of learning, learning mode, and internet connection problems and online platforms.

Because students struggle with access to internet connection, beginning science teachers resort to a video recording of their discussion, which allows the students to access the material any time they are capable. Also, it was revealed that teachers incorporate YouTube videos in their instructional materials as supplementary especially when there are scientific terms that are better understood with visual explanation.

In terms of assessment of learning, teachers inform students ahead of time when there is an assessment. However, a deadline is provided. In the case of laboratory activities, it was found that some teachers did not allow students to perform the activities, but rather, the teacher performed and recorded the laboratory activities. To assess students learning, the teacher lets the students describe and explain the results of the activity. When the teacher lets the students perform the activity, the students must video record it. The teacher only allows students to perform the activity after a thorough discussion of the activity. It was also revealed that teachers resort to responsive coping for students who have problems with technology use. It was revealed that teachers do not let use Microsoft programs but rather any mobile programs since these are mobile-friendly and because most students have mobile phones than laptops.

Teachers allow students to hand-write their outputs and take a picture for submission. This is in response to students who have no access to laptops or have difficulty using technology, such as attaching files. It was also revealed that beginning science teachers use common online/ social media sites such as Facebook, Facebook Messenger, and Google Classroom as their communication platform. Despite these creative responses, that there is still a need lessen transitional challenges of beginning teachers (Mena & Clarke, 2021). One such way is through mentor teachers placed to support beginning teachers (Orland-Barak & Wang, 2021).

Conclusion

The study envisioned that as beginning science teachers voice out the challenges and their coping strategies, their stories could spark interventions to guide and support science teachers and other beginning teachers. Further, this study would also be significant to new and old teachers alike because of the sudden shift to online/ flexible learning mode. Through the voices and the stories of the beginning science teachers, this study sought baseline data that could be used so that academic institutions may provide assistance and support to beginning science teachers.

The study drew out the voices of beginning science teachers and their stories of challenges, which include some difficulties, namely adapting to the culture of the new generation of students, access to a stable internet connection, problems with technology use, and adjustments in the teaching-learning process. The study also probed the relative and resilient coping strategies of beginning science teachers in response to the challenges, including creative and responsive adjustments to teaching-learning, learning assessment, learning mode, internet connection problems, and online platforms. The study concludes that beginning science teachers are faced with challenges brought about by two factors: transitioning to the actual teaching practice and adjusting to the new normal in education.

Considering the findings and conclusion of this study, several implications were utilized to generate recommendations. The following recommendations include, but are not limited to: (1) Immediate supervisors such as chairpersons must frequently check on beginning science teachers so that necessary assistance and guidance may be provided through consultation; (2) Although done virtually, such as meetings, Professional Learning Communities (PLC) are beneficial to beginning science teachers since these not only provide for pedagogical content knowledge but essentially provide for moral support to teachers; (3) Academic institutions must assess and then strengthen teachers' educational tools such as access to stable internet connection, and provide for devices such as laptops which are vital in the delivery of online education; (4) Identify and provide (when possible) an online learning platform that is mobile-friendly since not all students possess laptops; (5) Strengthen students' ICT skills because it is not only an essential skill in online education but a fundamental skill to be possessed to become globally competent; (6) Beginning science teachers should plot their synchronous meetings at least monthly and inform students of the schedule of synchronous meetings beforehand; (7) Activities should be planned, especially deadlines or submissions, at least per month and inform the schedule to students beforehand; (8) Video discussions that are not too lengthy and are contextualized be provided; and (9) Laboratory activities should be safe and require materials and equipment available at home.

The study was able to draw the voices of three beginning science teachers. However, because there were only a few beginning science teachers during the study, in-depth interviews were necessitated. In addition, the pandemic has placed restrictions on in-person interviews. A bigger-scale study is suggested to include beginning science teachers from different universities.

Acknowledgement

The authors wish to acknowledge the University of San Carlos, the Department of Science and Technology and Cebu Technological University whose support have made contributed in the completion of this study.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

Author Contributions

J. M. M. Loseñara: is the principal author of the study, conceptualizing the study, grounding the theoretical foundations, ensuring the research gap, designing the research methodology and interpreted and analyzed data. **C. P. Loseñara:** created the conceptual framework, wrote initial draft, sought permissions by sending letter requests and reached out to the participants. Both authors together coded data; wrote initial drafts and collaboratively polished the paper.

References

Ahmed, M. A., Lawal, A. A., & Ahmed, R. A. (2022). Influence of teachers' self-efficacy on secondary school students' self-efficacy in biology in Ogbomoso, Nigeria. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, *8*(1), 58–64. https://doi.org/10.22219/jpbi.v8i1.17231

Asio, J. M. R., Gadia, E., Abarintos, E., Paguio, D., & Balce, M. (2021). Internet connection and learning device availability of college students: Basis for institutionalizing flexible learning in the new normal. *Studies in Humanities and Education*, *2*(1), 56–69. https://doi.org/10.48185/she.v2i1.224

Camargo, C. P., Tempski, P. Z., Busnardo, F. F., de Arruda Martins, M., & Gemperli, R. (2020). Online learning and COVID-19: A meta-synthesis analysis. *Clinics*, *75*, e2286. https://doi.org/10.6061/clinics/2020/e2286

Cerkez, E.-B. (2020). *Beginning teachers experiences*. *INTED,* 6253–6258. https://doi.org/10.21125/inted.2020.1691

Clandinin, D. C. (2008). Narrative inquiry. In *The SAGE Encyclopedia of Qualitative Research Methods* (pp. 541–544).

Commission on Higher Education. (2020). *Guidelines on the implementation of flexible learning*. https://ched.gov.ph/wp-content/uploads/CMO-No.-4-s.-2020-Guidelines-on-the-Implementation-of-Flexible-Learning.pdf

Danjou, P.-E. (2020). Distance teaching of organic chemistry tutorials during the covid-19 pandemic: Focus on the use of videos and social media. *Journal of Chemical Education*, *97*(9), 3168–3171. https://doi.org/10.1021/acs.jchemed.0c00485

Department of Education - Teacher Education Council. (2017). *Philippine Professional Standards for Teachers (PPST)*.

Department of Information and Communications Technology. (2020). *Data says PH internet improved; DICT says it could do better*. Retrieved from Dict.Gov.Ph: Https://Dict.Gov.Ph/Data-Says

Donnelly, J. M. (2020). Resilience in the face of crisis: Organizational response to developing faculty elearning literacy in a global pandemic. *The Journal of Literacy and Technology*.

du Plessis, A. E., Cullinan, M., Gramotnev, G., Gramotnev, D. K., Hoang, N. T. H., Mertens, L., Roy, K., & Schmidt, A. (2020). The multilayered effects of initial teacher education programs on the beginning teacher workforce and workplace: Perceptions of beginning teachers and their school leaders. *International Journal of Educational Research*, *99*, 101488. https://doi.org/10.1016/j.ijer.2019.09.010

Dvir, N., & Schatz-Oppenheimer, O. (2020). Novice teachers in a changing reality. *European Journal of Teacher Education*, *43*(4), 639–656. https://doi.org/10.1080/02619768.2020.1821360

Fabito, B., Trillanes, A., & Sarmiento, J. (2021). Barriers and challenges of computing students in an online learning environment: Insights from one private university in the Philippines. *International Journal of Computing Sciences Research*, *5*(1), 441–458. https://doi.org/10.25147/ijcsr.2017.001.1.51

Harahap, F. N. (2019). The effect of blended learning on student's learning achievement and science process skills in plant tissue culture course. *International Journal of Instruction*.

Hart, C. (2020). *Educators are learners, too.* https://www.ednc.org/perspective-educators-are-learners-too/

Haydon, G., Browne, G., & van der Riet, P. (2018). Narrative inquiry as a research methodology exploring person centred care in nursing. *Collegian*, *25*(1), 125–129. https://doi.org/10.1016/j.colegn.2017.03.001

Holloway, S. M., & Gouthro, P. A. (2020). Using a multiliteracies approach to foster critical and creative pedagogies for adult learners. *Journal of Adult and Continuing Education*, *26*(2), 203–220. https://doi.org/10.1177/1477971420913912

Johnson, B., Down, B., Le Cornu, R., Peters, J., Sullivan, A., Pearce, J., & Hunter, J. (2014). Promoting early career teacher resilience: a framework for understanding and acting. *Teachers and Teaching*, *20*(5), 530–546. https://doi.org/10.1080/13540602.2014.937957

Johnson, R. O. (2013). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*.

Jorilla, C. D., & Bual, J. M. (2021). Assessing the teachers' competence in diocesan Catholic schools relative to the Philippine professional standards for teachers. *Philippine Social Science Journal*, *4*(2), 71–79. https://doi.org/10.52006/main.v4i2.343

Kay, R. H. (2012). Exploring the use of video podcasts in education: A comprehensive review of the literature. *Computers in Human Behavior*, *28*(3), 820–831. https://doi.org/10.1016/j.chb.2012.01.011

Keller-Schneider, M., Zhong, H. F., & Yeung, A. S. (2020). Competence and challenge in professional development: teacher perceptions at different stages of career. *Journal of Education for*

Teaching, *46*(1), 36–54. https://doi.org/10.1080/02607476.2019.1708626
Khan, R. A., & Jawaid, M. (2020). Technology Enhanced Assessment (TEA) in COVID 19 Pandemic. *Pakistan Journal of Medical Sciences*, *36*(COVID19-S4). https://doi.org/10.12669/pjms.36.COVID19-S4.2795
Khoirudin, R., Ashadi, A., & Masykuri, M. (2021). Smart Apps Creator 3 to improve student learning outcomes during the pandemic of COVID-19. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, *7*(1), 25–34. https://doi.org/10.22219/jpbi.v7i1.13993
Kosterelioglu, I. (2016). Student views on learning environments enriched by video clips. *Universal Journal of Educational Research*, *4*(2), 359–369. https://doi.org/10.13189/ujer.2016.040207
Malunes, R. E., & Dioso, D. P. D. (2020). Teaching competence of public school teachers in the light of the Philippine Professional Standards for Teachers. *Philippine Social Science Journal*, *3*(2), 43–44. https://doi.org/10.52006/main.v3i2.179
Martin, F., Sun, T., & Westine, C. D. (2020). A systematic review of research on online teaching and learning from 2009 to 2018. *Computers & Education*, *159*, 104009. https://doi.org/10.1016/j.compedu.2020.104009
Maryuningsih, Y., Hidayat, T., Riandi, R., & Rustaman, N. Y. (2022). Application of genetic problem base online discussion to improve genetic literacy of prospective teachers. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, *8*(1), 65–76. https://doi.org/10.22219/jpbi.v8i1.19035
Mena, J., & Clarke, A. (Eds.). (2021). *Teacher Induction and Mentoring*. Springer International Publishing. https://doi.org/10.1007/978-3-030-79833-8
Mok, S. Y., Rupp, D., & Holzberger, D. (2023). What kind of individual support activities in interventions foster pre-service and beginning teachers' self-efficacy? A meta-analysis. *Educational Research Review*, *40*, 100552. https://doi.org/10.1016/j.edurev.2023.100552
Orland-Barak, L., & Wang, J. (2021). Teacher mentoring in service of preservice teachers' learning to teach: Conceptual bases, characteristics, and challenges for teacher education reform. *Journal of Teacher Education*, *72*(1), 86–99. https://doi.org/10.1177/0022487119894230
Paudel, P. (2020). Online education: Benefits, challenges and strategies during and after covid-19 in higher education. *International Journal on Studies in Education*, *3*(2), 70–85. https://doi.org/10.46328/ijonse.32
Peimani, N., & Kamalipour, H. (2021). Online education and the COVID-19 outbreak: A case study of online teaching during lockdown. *Education Sciences*, *11*(2), 72. https://doi.org/10.3390/educsci11020072
Pekdağ, B. (2010). Alternative methods in teaching chemistry: Leaning with animation, simulation, video and multimedia. *Journal of Turkish Science Education.*
Schnepfleitner, F. M., & Ferreira, M. P. (2021). Transformative learning theory – Is it time to add a fourth core element? *Journal of Educational Studies and Multidisciplinary Approaches*, *1*(1), 40–49. https://doi.org/10.51383/jesma.2021.9
Singh, L. K. , T. R. K. , N. M. T. V. (2019). online learning platforms for flexible learning in educational framework. *Think India Journal.*, *22*(14).
Tan, A. L., & Towndrow, P. A. (2009). Catalyzing student–teacher interactions and teacher learning in science practical formative assessment with digital video technology. *Teaching and Teacher Education*, *25*(1), 61–67. https://doi.org/10.1016/j.tate.2008.07.007
Tondeur, J., Pareja Roblin, N., van Braak, J., Voogt, J., & Prestridge, S. (2017). Preparing beginning teachers for technology integration in education: ready for take-off? *Technology, Pedagogy and Education*, *26*(2), 157–177. https://doi.org/10.1080/1475939X.2016.1193556
Van Schalkwyk, S. C., Hafler, J., Brewer, T. F., Maley, M. A., Margolis, C., McNamee, L., Meyer, I., Peluso, M. J., Schmutz, A. M., Spak, J. M., & Davies, D. (2019). Transformative learning as pedagogy for the health professions: a scoping review. *Medical Education*, *53*(6), 547–558. https://doi.org/10.1111/medu.13804
Wingo, N. P., Ivankova, N. V., & Moss, J. A. (2017). Faculty perceptions about teaching online: Exploring the literature using the technology acceptance model as an organizing framework. *Online Learning*, *21*(1). https://doi.org/10.24059/olj.v21i1.761
Wolff, L.-A. (2022). Transformative learning. In *Encyclopedia of Sustainable Management* (pp. 1–10). Springer International Publishing. https://doi.org/10.1007/978-3-030-02006-4_1135-1
Yustina, Y., Syafii, W., & Vebrianto, R. (2020). The effects of blended learning and project-based learning on pre-service biology teachers' creative thinking skills through online learning in the Covid-19 pandemic. *Jurnal Pendidikan IPA Indonesia*, *9*(3), 408–420. https://doi.org/10.15294/jpii.v9i3.24706
Zukas, M. (2011). Making a mess of boundaries: A tale of doctors. *Key Note Presentation at the Australian Association for Research in Education Conference.*