

Flipped Classroom Approach: Experiences from a Philippine State University

Roselyn R. Gonzales

roselyn.gonzales@ctu.edu.ph

Cebu Technological University-Danao Campus

Abstract The flipped classroom approach has gained popularity in the education system in recent years; thus, the present study explored the 49 second-year regular, pre-service teachers' lived experiences relevant to the employment of the aforesaid approach. In the Focus Group Discussion (FGD), themes emerged from participants' responses and selected outputs, with the aid of the NVivo software application. Descriptive phenomenology yielded five themes categorized into two parts: a) lived experiences of the student –participants and b) challenges encountered by the participants. The study revealed that flipped classroom approach could be used effectively in subjects like Child and Adolescent Development and Action Research in Mathematics. Challenges encountered by the participants pointed mainly to the approach and to the technological package. Experiences of the participants were varied, serving inputs for the improved implementation of such an approach.

Keywords: descriptive phenomenology, flipped classroom, lived experiences, thematic analysis

Introduction

The educational landscape today undergoes massive transformation in terms of content, methods, and spaces of learning (UNESCO, 2015). From teacher-centered to a more

learner-centered approach, this paradigm shift has caused changes in structuring classroom activities. The flipped classroom, also known as reverse instruction, is one of the new learner-centered approaches that intends to prepare students for the 21st century (Lane-Kelso, 2015).

21st Century Learning

One of the many pressing issues confronting educators nowadays is the manner of structuring a 21st-century classroom. Scott (2015) posits that new technologies, international competition, globalization, and others require students to succeed in the present era. Information, media, and technology are considered necessary components of the framework for 21st-century learning (King, Williams, & Warren, 2011). Consequently, educators need to reinvent their classrooms if they want to produce learners who are ready for the present era. The use of a learner-centered approach, like flipping, coupled with technological platform, could be an effective way of molding these learners.

The Flipped Classroom Approach

The flipped classroom approach is a technology-infused learning model that has been gaining popularity among educators recently (Jensen, Kummer, & Godoy, 2015). The effectiveness of such an approach is emphasized in some studies, thus promoting the narrative about the prevalent instrumentality leading to success in the academe. In fact Schmidt and Ralph (2016) found out that using a flipped classroom increases student engagement. Students believe that the teaching method can stimulate the memory, deepen understanding, and improve problem-solving ability (Li, Jiang, Li, & Liu, 2016).

Moreover, Lo, Hew, and Chen (2017) claimed that students found the approach more engaging than the traditional one. They liked watching instructional videos, as these improve their communication with peers. This implies that teachers play a significant role in identifying videos for the learners.

In another study, Mortensen and Nicholson (2015) found that students taught in a flipped format developed more critical thinking skills due to the challenges brought about by the various exercises provided by the teachers. The cognitive and non-cognitive gains observed among first-year students, in the study of Acelajado (2017) affirmed such findings. Cognitive benefits include improved achievement, better critical thinking, and significant learning gains. Non-cognitive benefits include higher cooperation skills and improvement of attitude toward mathematics.

The positive effects of the approach, when used in a mathematics class, was further supported by the study of Calamlam (2016), which revealed a significant impact of the method on the performance of students in a trigonometry class. The study revealed that such effectiveness is significantly larger to high performing students than to moderately performing ones. This finding may imply that in some aspects, the use of the approach may only be more useful for fast learners. `

The exposure to a flipped classroom resulted in a more significant improvement in understanding of concepts in a Biology class as observed by Malto, Dalida, and Lagunzad (2018). The same study claimed that the students developed positive attitude and improved their performance in the subject. Their finding even indicates that the approach is not just applicable for English and Math, but also for Science and Biology subjects.

If the 21st century demands for modernization of systems and practices of learning (Eye, Gilb, & Hicks, 2014) then flipped approach presents itself as a viable tool toward the attainment of such. The method lends well to the development of collaboration-one of the pedagogies that support deeper learning (Scott, 2015).

Reviewed literature suggests the manifestation of positive effects of the flipped approach when used in subjects like Science, Mathematics, and English; however, there is no indication of such in professional education subjects like Child and Adolescent

Development and research subjects like Action Research in Mathematics. Apart from the aforesaid gap, the present study considers the common scenario where students have to depend much on the teacher or whoever is assigned to discuss certain topics in class. The growing sense of procrastination among learners is indeed an area that is not given premium in literatures, hence the study on innovative teaching strategy—the flipped approach.

Purposes of the Research

The study determined the student-respondents' lived experiences of the flipped classroom approach. Specifically, the study sought answers to the following:

1. To explore the lived experiences of the student-respondents on the use of the flipped classroom approach.
2. To identify the challenges encountered by the students and teachers in the implementation of the flipped classroom.

Methodology

Research Design

This study took on the philosophical perspective of phenomenology that examines everyday experiences without pre-supposing them, showing openness to what is presented by a particular phenomenon (Converse, 2012). In this study, the researcher documented the experiences of the participants exposed to a new approach (flipped classroom) through FGD characterized by bracketing or allowing the participants to share their experiences, views, and ideas without pre-supposing knowledge.

Participants

The participants were the 49 second-year, pre-service teachers of a state university. There were 14 Bachelor of Secondary Education major in Technology and Livelihood Education (BSED-TLE) students of Child and Adolescent Development class, and 35 Bachelor of Secondary Education major in Mathematics students of Action Research in Mathematics.

All the 54 students comprise the second year of the College of Education level who participated in the implementation of the approach. However, only the 49 regular students were included in the study because the remaining irregular students cannot attend the scheduled FGD session because they have to attend their other classes.

Instrument

A researcher-made interview guide explored the lived experiences of the participants. The interview guide comprised of seven open-ended questions. These included (a) Do you have an idea about the flipped classroom approach? If yes, how? (b) Which thoughts come into mind when you first hear “flipped classroom”? (c) What equipment and facilities did you use in the implementation of the flipped approach? (d) Which method do you prefer, the traditional or the flipped? Why? (e) Based on your experiences, what do you think is the difference between conventional and flipped classroom approaches? (6) Was the flipped classroom approach practical? Why? Why not? (f) What issues and challenges did you encounter in the use of the flipped classroom? (g) Will you recommend the use of the flipped classroom in other subjects? Why? Why not?

The purpose of this research provided direction in the formulation of the interview questions. The researcher initially formulated the questions and discussed the content validity with the Action Research in Mathematics teacher who is at the same time the research chair. The criteria considered in the evaluation

of the questions include a) suitability of items, b) adequateness of the coverage, and c) presentation of items. The re-structuring of the interview questions followed, and the final version was presented to a panel of experts who evaluated the proposal in the university's In-house Research Congress.

Data Collection

The collection of data involved three phases: (a) preliminary phase, (b) actual implementation phase, and (c) evaluation phase.

Phase 1 (Preliminary Phase)

The first phase dealt with the preparation for the implementation of the approach. Both the researcher and subject teacher oriented the student-participants on the implementation of the approach. The teachers informed the participants about how the method works and the tasks that they needed to perform, including reminders on the additional "study time" on their part. The discussion further acquainted students with the use of a technological platform such as Smart TVs, laptops, and the internet. The researcher and the subject teacher then explained how the specific topics in *Child and Adolescent Development* and *Action Research in Mathematics* subjects would be carried out using the approach. The teachers provided the course outline and requirements during the first meeting to create awareness among the participants. The participants, in turn, gave their expectations.

Phase 2 (Actual Implementation)

The second phase was the actual implementation of the approach. The participants were given topics to read through a PowerPoint presentation accessible online or through their textbooks before they came to class. During the first eight weeks of implementation, the technological package was not yet available

in the educational laboratory. However, the participants utilized library facilities, and some/others used their computers at home to access the required homework. For the remaining eight weeks, the participants used their laptops. Table 1 shows the activities conducted.

Table 1. List of Activities Implemented in Action Research in Mathematics Class

Topic	Online material/ Reading List	Activity	Assessment	Utilized Flipped Approach?	No. of Hrs. Spent in class	No. of Hrs. Spent out of class
Brief Overview about Educational Researches	Textbook Reading	Group Discussion Online interaction	Oral Recitation	Yes	3	3
Research Design and Analysis	Textbook Reading	Lecture	Oral Recitation	No	6	0
Research Trends and Issues in Mathematics Education	Textbook Reading	Round Table Discussion	Group Report	No	3	
Basics in Research Paper Writing	Fundamentals of Research Paper Writing and Publishing (International Journal of Technology Enhanced Learning, 6(2), 105–123.) by Derntl (2014) Use www.searchproquest.com , www.sciencedirect.com for literature reading	Literature Reading Choosing the right topic for a research project	Topic defense	Yes	9	6

Technology Inclusion in Research Paper Development	www.search-proquest.com , www.science-direct.com , www.zotero.com , www.turnitin.com	Retrieving metadata Creating Parent Item Citing articles using APA 6 TH edition	Checking of Zotero account per group with the literature of the approved topic Online feedback	Yes	9	12
Preparation of Research Proposal	On-line reading of materials depending on the approved topic	Orientation to Turnitin Class	Manuscript	No	12	30
Presentation of Research Proposal	None	Actual writing/ Consultation Group Presentation	Quality of manuscript and the manner of presentation	No	9	0

Table 1 shows the topics in *Action Research in Mathematics* class that utilized the flipped classroom approach. Out of the seven topics covered in the syllabus, only three or 42.86% used the procedure on account of the subject’s nature, which necessitated either to invoke the expertise of the teacher or to cater to the learning styles of the students. Some students would like to be alone at times or learn individually. According to Mok (2014), converting part of a course is preferable to gunning for a “big bang” when using a new approach. Since it was a research class, the last lesson was focused on crafting the required proposal, so students often came to class for consultation. One topic utilized the lecture method, while the rest of the topics used other student-centered approaches.

Table 2 shows the list of activities implemented in the *Child and Adolescent Development* class.

Table 2. List of Activities Implemented in Child and Adolescent Development Class

Topic	Online material/ Reading List	Activity	Assessment	Utilized Flipped Approach?	No. of Hrs. Spent in class	No. of Hrs. Spent out of class
Human Development: Meaning, Concepts, and Approaches	The Life of Teddy Stoddard (http://www.teachnet.com/speakout/inspiration/)	Small-group discussion	Presentation of output through PowerPoint	yes	3	3
The Stages of Development and Developmental Tasks	Life before Birth: In the Womb (https://www.youtube.com/watch?v=0gAsdE-UNUJY)	Dyad	By-pair oral discussion	yes	6	3
Issues on Human Development	Textbook Reading	Debate	Performance-based (with the aid of a holistic rubric)	yes	3	3
Freud's Psychoanalytic Theory	https://www.slideshare.net/kinaa1/psychoanalytic-theory-sigmund-freud	Filling-up of a graphic organizer to highlight the stages of Freud's theory	Graphic organizer	yes	6	3
Piaget's Stages of Cognitive Development	https://www.slideshare.net/mcgrail19/jean-piagets-theory-of-cognitive-development Textbook Reading	Roleplaying Watching an episode of a "soap opera" that focuses on the interaction of the members of the family	Performance-based (role play) Oral discussion of the chosen "soap opera."	yes	6	3
Erikson's Psycho-Social Theory of Development	https://www.slideshare.net/sankolsm/eriksons-psychosocial-stages-of-developmetn Textbook Reading	Filling up of the Self-report questionnaire from Rhona Ochse and Cornelis Plug Group discussion	Group presentation through PowerPoint	yes	3	3
Kohlberg's Stages of Moral Development	The Heinz Dilemma (https://screbble.com/2017/02/thinking-exercise-heinz-dilemma/) https://www.slideshare.net/sgrinagle1/kohlbergs-theory-on-moral-development	Decision-making sessions	Oral recitation	yes	3	3

Vygotsky's Socio-Cultural Theory	Textbook Reading	Group Report	Recitation/ Quiz	yes	3	3
Bronfenbrenner's Ecological Theory	https://www.youtube.com/watch?v=5htR-hvm4iyI	Small-group discussion	Group presentation through PowerPoint	yes	3	3
Pre-Natal period	Textbook Reading	Group project (Production of a brochure) Writing an appeal letter to the mother who is about to commit abortion	Product (brochure) and performance-based (manner of presenting the brochure)	yes	6	3
Infancy and Toddlerhood	Textbook Reading	By-pair discussion	Presentation through PowerPoint	yes	3	3
Early Childhood, Middle Childhood, and Late Childhood	Lecture-discussion by the teacher	Reflection of student's development	Compilation of pictures	no	3	
Adolescence	Lecture-discussion by the teacher	Individual Project/ Reflection/ Sharing of experiences/ Finding their similarities and differences	Recitation	no	3	

Table 2 shows the topics that utilized the flipped classroom approach. In the actual practice, only 11 out of 13 or 84.62 % of the topics covered in the Child and Adolescent subject were carried out through the use of the approach. Seven out of 11 topics or 63.63% utilized online sources such as PowerPoint presentations or videos. Four out of 11 or 36.36% of the topics used pure textbook reading. Lastly, two out of three topics made use of a combination of textbook reading and online sources.

Phase 3 (Assessment)

To document the lived experiences of the participants, the researcher conducted the FGD. Each group had at least five members. To avoid partiality, the teacher for *Child and Adolescent*

Development subject conducted the FGD with the students of *Action Research in Mathematics* and vice-versa. The results of the interview were encoded in the NVivo software application. The participants then shared whether or not they were amenable to the transcriptions. The researcher observed the necessary protocols in the conduct of the interview. The student-respondents were informed about the voluntary nature of their participation. They were made to sign an Informed Consent Form, and the content of which was clearly explained to them. Analysis of data was also made to complement the interviews conducted. The study of the outputs of the participants in *Action Research in Mathematics* class was taken from the Turnitin class activities, while the PowerPoint presentations from Child and Adolescent class and other assessment tasks were used.

Data Analysis

Colaizzi's method aided in phenomenological data analysis. The process included: a) reading and re-reading the transcript; b) extracting the significant statements; c) recording statements on separate sheets with pages and line numbers and formulating meanings from comments; d) categorizing purposes and themes; e) integrating findings into an exhaustive description of the phenomenon; f) describing the fundamental structure of the event; and g) validating the results.

The transcripts were read twice so that that the researcher could get a grasp of its content. Highlighting of relevant statements was made for emphasis. The NVivo software application generated the word cloud, while themes were identified based on the salient features of the interview results. Nvivo software was used to identify the number of references and word frequency.

Findings

This section presents the results reflective of the (1) themes derived from the lived experiences of the research participants

and (2) the challenges encountered by both the students and teachers in the implementation of the flipped classroom approach.

Table 3. Themes Derived from the Analysis of the Interview Transcripts

Thematic Use	Non-verbatim Response with Frequency	Sample Transcripts	Generated Description of Themes
First Impression: Does it last?	The students were amused and excited (12); they found the new approach as great and unique (8) while thinking it is technology-driven (5).	I was excited and amused because we were the first class to use the flipped classroom approach (Student 4).	The first impression of students before the actual implementation of the approach
Working together makes learning better	The approach helped students share their ideas (15) in a group (10).	Students face one another in each group and work together as a team (Student 42).	The benefits of sharing ideas, and working together in groups make learning better
Embracing Technology	Technology (13) enabled students to access online sources (11) that would make learning easier or better (13).	The flipped classroom approach is different because it centered on the use of modern technology and sending assignments online. Technology helps us do our work better (Student 20).	The positive contribution of technology toward making the assigned tasks easier
Is the flipped approach preferred over the traditional?	Students preferred the approach because they became more alert or active (8), more involved (5) as they found the approach more convenient (5).	I preferred the flipped approach. I became alert, attentive, and more involved in the class; it is like that I am free to explore and get also involved with my fellow students and to my teacher (Student 1).	Students' preference of the flipped classroom over the traditional
Flipped effects are effective	The students gained self-confidence (5), improved on their skills (6), and became independent and competent learners (4).	It boosts my confidence, improved my speaking skills, and it is easy to understand the lesson. (Student 7).	The overall effect of the flipped-classroom approach to the skills, level of confidence, and competence among students

Lived Experiences of the Student-participants

This section presents the lived experiences of the student-participants. The researcher generated six thematic areas based on the interview transcripts.

First impression: Does it last?

The traditional method of teaching, where the teacher delivers the lecture, is the usual experience of the students. With the growing need to revolutionize teaching methodologies, constructivists strongly pave the way through the educational system. This approach calls for a more student-centered classroom.

Introducing the flipped classroom approach made the students excited, amused, and interested because the method is not so familiar to them, including the technological package.

“When I first hear the term flipped classroom, it sounds interesting” (Student 29), “it is unique and unusual” (Student 40), “it is something unique and hard to operate” (Student 31), and “it is a room that things in there could flip automatically” (Student 34).

Some students mistakenly thought of it as a room where everything will flip or turn upside down. Through the orientation conducted by the teachers, they were able to understand that a flipped classroom is an approach, not the physical room itself. Other participants thought that it was a room where they could access anything or a place packed with technology. On the other hand, one participant felt that it was a room distinct from the rest of the classrooms in the university (Student 28).

In the interview transcripts, the researcher noted the correct perceptions about the nature of the approach. However, it was also clear that there were misconceptions, which implied that the teachers needed to clear vague concepts so that the participants

would be clarified on the nature of the approach since it was unfamiliar to them.

Working together makes learning better.

The type of motivation used by the students in the use of the flipped classroom approach was intrinsic rather than extrinsic because they became responsible and involved in their learning (Hawks, 2014). Collaboration is, therefore, a requisite for students to learn. Collaboration is proven in the following transcript

“We are assigned different topics in groups” (Student 31), “we need to work hard so that we can share our learnings with others in an effective way” (Student 30), because of this, “students become more active in group activities” (Student 34).

According to Donovan and Lee (2015) one of the goals of the flipped classroom is to utilize in-classroom time to discuss, perform activities (including group work), and practice solving problems. In this study, Student 30 thought that he needed to exert effort to be able to share ideas with his groupmates or classmates. This hard work could mean extra time and effort spent on studying after school hours. Despite spending extra time to work on their assignments, it is interesting to note that students find this a way to help themselves contribute to the group tasks.

The 21st century calls for more collaboration among learners. With the teacher as the “guide on the side,” students are encouraged to work interdependently as a team. Based on observations, students were very eager to do their tasks, especially when they are in groups. The students submitted the required outputs on time.

Embracing technology

Based on interviews, student-respondents embraced the use of technology in the implementation of the flipped

classroom approach. According to them, it made learning more interactive and efficient.

“The approach helps students engage in higher technology like the use of smart TV and how to operate the laptops for presentations” (Student 16). Moreover, “we are bound to be educated more in online lectures” (Student 18), “the advanced technology make our work more comfortable and better” (Student 22), “easier and faster” (Student 22), thus making learning more interactive” (Student 23).

The interview transcripts suggest that the use of technology in the classroom creates a positive impact on the students. They thought that it could make their work lighter and more manageable. On the other hand, some also felt that technology made them more interactive in the learning process. In general, student’s capacity to use technology, especially in the production of PowerPoint presentations, was above average because of their training in *Computer Literacy* classes. The use of the approach allows them to apply and improve existing knowledge.

Is the flipped approach preferred over the traditional?

The flipped classroom reverses the traditional lecture to a “homework status” whereby interactive learning takes place through the use of technology, thus coined as “hybrid” learning (Missildine, Fountain, Summers & Gosselin, 2013). According to Gerstein (qtd. in Jin, 2016) the flipped classroom approach transformed the traditional role of teachers and increased the interaction between them and the students during class. The following transcripts corroborated with these studies:

“If I chose, I would choose the flipped because the approach helps students to work on their own, to gain knowledge on the specific subject” (Students 2, 8, 11),

we can explain further whatever thought and ideas we have in mind, and we can adequately express our understanding” (Student 3).

The interview transcripts suggest that the flipped approach is preferred over the traditional ones. The participants thought that they become more alert and involved in class, become independent learners by working on their own to gain knowledge. Other participants thought that the approach is interesting, not dull. According to some, the presentation of outputs is hassle-free; it is more convenient and effective, and storing and retrieving information is more comfortable.

“We can directly or easily present our reports using a computer instead of the conventional ways, which make our life more comfortable (Student 9), and “hassle-free” (Student 4). Furthermore, the participants preferred the flipped approach over the traditional because “it is exciting as to what activity the teacher will assign, to which group we are going to go, and the group activity that we do” (Student 12).

With a very positive view about the use of the flipped classroom, this indicates that learners also wanted to change their usual way of doing things. They could be the knowledge provider at times that make them become more involved in the learning process.

Flipped effects are effective.

According to Enfield (2013) the flipped classroom model may be considered appropriate in the preparation of the students in their 21st career, and this can improve their self-efficacy with regards to independent learning. Based on interviews, student-respondents feel that there are many benefits that they gain from the teacher’s use of the approach.

In a study conducted by Wen-Chi, Chen Hsieh, and Yang (2017) most students thought that flipped instruction efficiently and effectively improved their oral performance compared to conventional lecture-based education. The experiences shared by the respondents affirm this study.

“Through this approach, I was able to gain self-confidence to take a stand of my ideas and share it with my classmates” (Student 2, 11), “gives me the perseverance to do the subject’s requirements” (Student 15), “I can quickly and actively engage in searching for topics and problems” (Student 19), and “I was able to try new way of learning and discover things independently” (Student 23).

The flipped classroom approach help students gain self-confidence because they need to share and defend their ideas, thus improve their speaking skills. They become responsible because of the need to prepare the day’s lesson before coming to class. Student 23 believes that she/he became competent in the use of technology, while student 15 developed perseverance in doing the subject’s requirement. These were some of the effects of the flipped classroom to the student-participants. The positive impact shown in this study might suggest that there is now the need to enhance its implementation and encourage instructors to use the approach in their classes.

Notably, all the participants submitted their requirements for *Action Research in Mathematics* on time. The activities include uploading of (a) the introduction; (b) framework and problem; (c) full proposal; and (d) revised plan. The analysis of the submitted documents focus on their similarity index and quality. In general, the quality of the proposals is only average.

Challenges Encountered by the Participants

The flipped classroom at first glance is challenging for both teachers and students alike. This section presents the challenges or difficulties that they both encounter in the implementation of the flipped approach.

The challenges encountered by the students do not point to the methodology itself, but only to the technological package used. These include: a) slow internet connection, b) not all students can use the laptop since there is only one laptop for the group, and c) the noise of their classmates during group activities.

The teachers faced difficulties in complying with bureaucratic procedures of the government, and the stringent procurement of materials and equipment. This difficulty caused a delay in the purchase of equipment used in the educational laboratory. The use of the method started as early as July when the first semester of Academic Year 2017-2018 began. However, the technological platform was not employed yet. The formal beginning of the actual use of the facilities and equipment only commenced last September 2017.

While equipment are in place, slow internet connection, including the limited time of the students to visit the classroom for their “off-class” tasks, remained. This scenario makes it difficult for instructors to work on the required activities. The educational laboratory is utilized for other classes, which further deprives the students of their access to the resources for their “homework” during their free time. The approach itself does not demand the technological package as it is used in this study. However, the inclusion of technology supports its implementation.

Discussion

The study determined the student-respondents’ lived experiences of the flipped classroom approach and identified the challenges

encountered by both students and teachers in the course of its implementation.

The lived experiences of the student-participants indicate an optimistic view of the approach as a factor that may improve their performance in both *Child and Development* and *Action Research in Mathematics* classes. Their experiences also create a favorable impression from the students on the use of technology both for their off-class and in-class activities. The participants regard technology as a blessing because this makes their work better and more efficient. The need for technology-infused learning classrooms can assist students in sustaining this impression (Roehl, Reddy, & Shannon, 2013). Though challenging and something new, the students still prefer the flipped classroom, which calls for their active involvement during activities, either in pairs or in groups. This conforms to the study of Butt (2014) which focused on teachers having the duty to explore a more interactive way of presenting courses. Notably, the use of the approach creates interest and curiosity among the students. The students' attitude toward school is changed because they become more responsible in preparing for the day's lesson.

Despite the very positive effect of the approach, there are still challenges relative to the availability of the technological set-up. Efforts and resources are fundamental needs to consider when flipping the classroom (Graham, Mclean, Read, Suchet-Pearson, & Viner, 2017). Responding to these challenges, however, improved in the overall implementation of the approach, as students wanted more collaboration to connect with others while working on their academic tasks. As a gainful insight for educators, the result could serve as basis in rethinking classroom approaches, with particular attention to student-centeredness. A reinvention at the center of the education system inclined to coping with the demands of the Fourth Industrial Revolution, teachers at different levels might consider flipping their classrooms.

The study is limited to exploring the lived experiences of the second-year students in one college of a state university in

the Philippines. It does not deal with the perspectives of other stakeholders, such as the school administrators and parents. Furthermore, the results of the qualitative interview were not correlated with the quantitative achievement of students.

Future researches may involve utilizing the approach in different classrooms, across subjects and colleges, to confirm the results of this study. Furthermore, a mixed-method sequential analysis may be done by combining data derived from the lived experiences of the participants and their scores in the examination.

Lessons Learned

The study is focused only on the lived experiences of the student-respondents on the use of the flipped classroom approach and does not explore other contexts. The challenges encountered by both teachers and students need efficient solutions. Sufficient budget may be looked into for internet facilities and computer units solely intended for Educational Technology Laboratory use. To manage noise due to group discussions, better classroom management strategies may be considered. Furthermore, it is essential to revisit room or laboratory utilization practices to ensure its effective use.

Acknowledgment

The author would like to thank Cebu Technological University for funding the project. The author also extends here sincere gratitude to Dr. Gamaliel G. Gonzales, and the 49 second year pre service teachers.

...

References

- Acelajado, M. J. (2017). *Flipped teaching approach in college algebra: Cognitive and non-cognitive gains*. Proceedings of the 13th International Congress on Mathematical Education. DOI 10.1007/978-3-319-62597-3_111
- Calamlam, J. M. M. (2016). *Effectiveness of blended e-learning approach in a flipped classroom environment*. The Asian Conference on Society, Education & Technology-Official Conference Proceedings. www.iafor.org
- Converse, M. (2012). Philosophy of phenomenology: How understanding aids research. *Nurse Researcher*, 20(1), 28–32.
- Donovan, J. D., & Lee, S. (2015). How we flipped: Student and instructor reflections of a flipped-class model in a sensory evaluation laboratory course 1. *NACTA Journal*, 59(4), 335-342. Retrieved from <https://search.proquest.com/docview/1763786727?accountid=147155>
- Enfield, J. (2013). Looking at the impact of the flipped classroom model of instruction on undergraduate multimedia students at CSUN. *TechTrends*, 57(6), 14-27. doi:<http://dx.doi.org/10.1007/s11067-013-9210-1>
- Gilb, M. L., Eye, A. M., & Hicks, V. M. (2014). *A policy analysis addressing 21st-century learning* (Order No. 3631430). Available from ProQuest Dissertations & Theses Global. (1564780630). Retrieved from <https://search.proquest.com/docview/1618835261?accountid=147155>
- Graham, M., McLean, J., Read, A., Suchet-Pearson, S., & Viner, V. (2017). Flipping and still learning: experiences of a flipped classroom approach for a third-year undergraduate human geography course. *Journal of Geography in Higher Education*, 41(3), 403–417. <https://doi.org/10.1080/03098265.2017.1331423>

- Jensen, J. L., Kummer, T. A., & Godoy, P. D. d M. (2015). Improvements from a flipped classroom may simply be the fruits of active learning. *CBE—Life Sciences Education*, *14*(1), ar5.
- King, L. H., Williams, J. B., & Warren, S. H. (2011). *Preparing and Supporting Teachers for 21st Century Expectations through Universal Design for Learning*. Morality in Education. The Delta Kappa Gamma Bulletin.
- Lane-Kelso, M. (2015). The pedagogy of flipped instruction in Oman. *TOJET: The Turkish Online Journal of Educational Technology*, *14*(1) Retrieved from <https://search.proquest.com/docview/1676565336?accountid=147155>
- Lo, C. K., Hew, K. F., & Chen, G. (2017). Toward a set of design principles for mathematics flipped classrooms: A synthesis of research in mathematics education. *Educational Research Review*, *22*, 50–73. <https://doi.org/10.1016/j.edurev.2017.08.002>
- Malto, G. A. O., Dalida, C. S., & Lagunzad, C. G. B. (2018). Flipped classroom approach in teaching biology: assessing students' academic achievement and attitude towards Biology. *KnE Social Sciences*, *3*(6), 540. <https://doi.org/10.18502/kss.v3i6.2403>
- Missildine, K., Fountain, R., Summers, L., & Gosselin, K. (2013). Flipping the classroom to improve student performance and satisfaction. *Journal of Nursing Education*, *52*(10), 597–599. <https://doi.org/10.3928/01484834-20130919-03>
- Mok, H. N. (2014). Teaching tip: The flipped classroom. *Journal of Information Systems Education*, *25*(1), 7-11.
- Mortensen, C., & Nicholson, A. (2015). The flipped classroom stimulates greater learning and is a modern 21st-century approach to teaching today's undergraduates. *American*

Society of Animal Science, 93, 3722–3731. <https://doi.org/10.2527/jas2015-9087>.

- Roehl, A., Reddy, S. L., & Shannon, G. J. (2013). The flipped classroom: An opportunity to engage millennial students through active learning strategies. *Journal of Family & Consumer Sciences*, 105(2), 44–49.
- Schmidt, S. M., & Ralph, D. L. (2016). The flipped classroom: a twist on teaching. *Contemporary Issues in Education Research (Online)*, 9(1), 1.
- Scott, C. L., 2015. *The futures of learning 2: What kind of learning for the 21st century?* Education, research, and foresight: working papers. UNESCO Digital Library.
- UNESCO (Ed.). (2015). *Rethinking education: towards a global common good?* Paris: UNESCO Publishing.
- Wen-Chi, V., Chen Hsieh, J. S., & Yang, J. C. (2017). Creating an online learning community in a flipped classroom to enhance EFL learners' oral proficiency. *Journal of Educational Technology & Society*, 20(2), 142-157. Retrieved from <https://search.proquest.com/docview/1902838377?accountid=147155>.