Schoology and Learning in Emergency Remote Teaching of Math: A Learner-Centered Perspective

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Abstract: Using an in-depth interview design (n=2), the study identified the changes in teaching and learning due to emergency remote teaching (ERT) of Math. It also explored how the use of Schoology, as a learning management system (LMS) and tool for ERT, supported student learning and promoted learner-centered teaching. Results indicated the following: transitioning to ERT means maximizing available tools and resources; student disengagement is an emerging challenge in ERT; Schoology, as the LMS, provided teachers with tools for organizing content, designing learning and assessment, providing more learning options to students; and learner-centered practices reported were related to organizing meaningful learning, utilizing feedback for self-monitoring and self-regulation, and creating nurturing relationships with students through mentoring.

Key Words: Schoology, emergency remote teaching, learner-centered education

1. INTRODUCTION

The coronavirus disease (COVID-19), a severe acute respiratory syndrome, has immensely contaminated people from different countries and continues to spread at an alarming rate (WHO 2020a). The COVID-19 pandemic has claimed more than a million lives all over the world (WHO 2020b). It continues to pose global threat across sectors of society. It has disrupted human lives, particularly schooling. The impact on the education sector has been drastic, causing most schools to temporarily shut down. The pandemic has impacted 1.2 billion learners worldwice, with more than 28 million learners from the Philippines (UNESCO, 2020)

Due to community lockdowns, Philippine schools offered alternative delivery modes, including online classes (Briones, 2020). But the transition from traditional face-to-face classroom learning to alternative learning modes were plagued by numerous challenges such as financial constraints for buying gadgets, insufficient time for training teachers, connectivity issues, and parent's readiness and capability to support online learning of their children – compelling progressive sectors to call for an "academic freeze" (Tadalan, 2021). The position of the government and other education stakeholders is to maximize alternative delivery modalities in order to facilitate continued learning and mitigate the impact of the pandemic on existing learning gaps and educational problems (Briones, 2020; Tadalan, 2021)

Philippine schools largely adopted the emergency remote teaching (ERT) approach as a response to the pandemic. ERT, a temporary shift of instructional delivery, involves the use of fully remote teaching strategies useful for responding to current crisis situations, but can be readily reverted back to face-to-face or blended classroom teaching (Hodges, Moore, Lockee, Trust, & Bond, 2020). The delivery of lessons is still largely done remotely through modular and digital platforms (Montemayor, 2020), combining both synchronous and asynchronous teaching strategies. Synchronous is

centered on live online discussions through different video platforms while asynchronous happens when students work at their own pace.

Although most K-12 schools reopened virtually to serve more than 24 million learners (22 million in the public schools, and 2 million in the private schools) (Montemayor, 2020), the transition from face-to-face classroom teaching ERT posed additional problems – particularly teachers' lack of readiness and competencies for distance learning, online teaching (Tadalan, 2021). Online teaching requires a different approach to designing instruction, assessing learning, and engaging students – which most local teachers were not prepared to do (Tadalan, 2021)

Although there are a lot of drawbacks in online learning or e-learning in the Philippines, there are also benefits in using technology. The use of synchronous online approaches provides a more flexible environment where students can work on their tasks in the comfort of their homes (Marshall & Kostka, 2020). Teaching Math subject requires the practice of pedagogical approaches to further develop understanding. Using technology in teaching Math increases the level of challenge for teachers to ensure that learning is established. Thus, Learning Management Systems (LMS) are utilized to help teachers in planning, instruction, and assessment.

LMS are under web-based instructions which are made for the purpose of easing and supporting the teaching and learning process. The accommodation of LMS in schools must be done with proper preparation and practice as it may become unsuccessful when learning is incomplete (Schlager, 2016). Integration of a new technology into the school system is rather a tedious process and its mastery may only happen when stakeholders exert effort in understanding it. There are different providers of LMS like Moodle, Blackboard, Teams, Schoology, Canvas, Coursera, and Google Classroom but one of the tools most commonly used all over the world is Schoology (Rodriguez-Segura, Zamora-Antuñano, Rodriguez-Resendiz, Paredes-Garcia, Altamirano-Corro, & Cruz-Perez, 2020).

Schoology is a widely used LMS used in the Philippines. Teachers prefer Schoology because of its user-friendly design wherein discussions, assignments, assessments, feedback, attendance and data tracking can be made conveniently (Masyhudianti, Sutomo, & Suparno, 2018). Schoology also follows a student-centered framework of "*Plan, Engage, Monitor, Adjust*" which focuses on the structure of the tool to utilize pedagogy, content, and technology in the successful implementation of the teaching and learning process (Ady, 2019). Schoology media developed the Math literacy skills and higher order thinking skills of Grade 9 students when teachers used realistic e-schoology like solving everyday problems involving numeracy (Wardono & Mariani, 2020). The LMS platform has promoted guided learning and active engagement in a subject like Math even in this ERT situation. Schoology is a functional and valuable instrument in the continuous teaching-learning of Math subjects. The experiences of both teachers and students may have changed but the use of this technology has ensured support during this ERT.

The main objective of this research is to explore the use of Schoology as an LMS in promoting student learning from a learner-centered perspective. This research aims to answer the following research questions:

1. What changes in the teaching practices and learning processes in emergency remote learning environments (ERT)?
2. How do teachers use Schoology to promote and support student learning in ERT?
3. How are their teaching practices aligned with learner-centered teaching?

Conceptual Framework

The Learner-Centered Psychological Principles defined 14 fundamental principles related to cognitive and metacognitive, motivational and affective, developmental and social, and individual differences factors influencing learners and learning (APA, 1997) The purpose of these learner-centered psychological principles is to provide a framework to guide educational reform and school redesign efforts (APA Work Group of the Board of Educational Affairs, 1997). Being learner-centered means taking the perspective that focuses on individual learners, their experiences, views, backgrounds, interests, abilities, and needs. It focuses on the best available knowledge about learning and how it transpires. It emphasizes teaching practices that are most effective in supporting students' motivation, learning, and achievement. Learner-centered approach supports programs, practices, policies, and people that support learning for all (McCombs & Whisler, 1997, p. 9)

Learning Management Systems and Learner Centered Principles

An LMS or e-learning platform is a software including a range of services that assist teachers with the management of their courses. The rapid development of technology, including the development of learning management systems for students and teachers, can support learning even under our current circumstance. The framework adds a constant reminder that the human element cannot be disregarded even when utilizing the most advanced educational systems, including technology supported networked learning communities (McCombs & Vakili, 2004).

McCombs and Whisler (1997) describe specific strategies that educators can use to create a learner-centered classroom environment using educational technology:

1. Organizes learning activities around themes that are meaningful to students.
2. Provides complex and challenging learning activities that promote conceptual and analytic thinking.
3. Helps students develop and refine their understanding through critical higher order thinking skills. Provides opportunities for students to choose their own project and work at their own pace.
4. Provides opportunities for students to collaborate with peers and includes peer teaching as a part of instruction.
5. Uses a variety of instructional strategies and methods to match students' needs.
6. Learning activities are personally and culturally relevant to the students.
7. Encourages shared decision making and students' point of view.
8. Monitors student progress continually and provides feedback on individual growth and progress.
9. Uses standardized and alternative forms of assessment and allows competencies and achievement of educational standards to be demonstrated in a variety of ways.
10. Uses heterogeneous grouping practices that promote cooperation, shared responsibility, and a sense of belonging.

2. METHODOLOGY

Research Design

The study employed a qualitative interview design to investigate how Filipino Math teachers use Schoology as a tool for promoting learner-centered teaching in ERT situations. The study specifically utilized the standardized open-ended interviews (Turner, 2010).

Participants

The researchers conducted separate in-depth online interviews for the two participants who are grade school Math teachers, teaching at a private school in Metro Manila, using Schoology as the main LMS for the delivery of their classes. Interviewee 1 has 3 to 5 years of experience (Grade 4 and 5) while Interviewee 2 has 5 to 10 years of experience (Grade 6). Currently, they handle 3 classes (~30 students) each for 1 hour on weekdays. Interviewee 1 rated LMS satisfaction as 5/5 while Interviewee 2 rated it as 4/5. Lastly, when asked about how helpful their school has been in supporting online teaching, both rated their experience 5/5.

Data Collection

Data were collected using an interview protocol and online survey form. After transcription, the researchers will conduct a collaborative qualitative analysis. Interview transcripts were then content analyzed to generate descriptive themes following general steps for qualitative data analysis (Creswell, 2014).

3. RESULTS AND DISCUSSION

Results highlight descriptions on what changes in the teaching and learning process in ERT situations, how the use of LMS supports student learning, and what current teaching practices are aligned with learner-centered teaching.

Changes in Teaching and Learning in ERT Situations

Participants indicated a number of changes in the teaching and learning processes in the current ERT setup. Since classes are done virtually, the methods used by the teachers are in accordance with what they can use online like applications, learning management systems, and informative websites. Teachers had to maximize available tools and resources available to facilitate learning. They fully

utilized the different access sites and platforms provided by their school in order to create a technology-supported learning environment.

"We upload worksheets, links that they can access should they feel the need for more information. We upload links to Koobits which help them learn Math easier. I guess it helps facilitate learning much easier." (Interviewee 2)

The teachers also felt that the social interaction between teacher-student, student-student and teacher-parent is challenging to facilitate despite the flexibility of online communication. What the study participants reported reflects the common challenge teachers face related to promoting and sustaining student engagement and perseverance (Zweig & Stafford, 2016). To cope with student disengagement, the participants strive to build relationships and promote engagement by using different opportunities for interaction like the use of Zoom meetings, email, and chatbox.

"I would notice it immediately if they are just staring. If they recite it means that they are still with you sometimes I would look at the gallery to check them one by one if I see (stagnant) participation. The difficult part there is if the child can act, to test if they are listening I would call them out to recite and I would often give them reminders. There is a tendency for the boys to often go to other websites. I also utilize the chat box and flood them with messages to turn on their cameras, I wouldn't stop until they turn on their cameras" (Interviewee 1)

Learner-Centered Practices in Using Schoology

Students can deepen and refine their understanding through purposeful activities in Schoology. The LMS provides opportunities for students to choose their work at their own pace. Students can browse through the list of uploaded activities they are drawn to and decide how they wanted to engage with the content in dependently. Learner-centered teaching organizes complex and challenging learning activities around themes meaningful to students, while allowing learners to choose their learning tasks and work at their own pace (McCombs & Whisler, 1997). It also emphasizes that students take more responsibility for problem solving and inquiry, while the teacher acts as a facilitator formulating problems and guiding students as they figure out the solutions individually and collaboratively with peers (Stephan, 2014)

"There is a feature in Schoology wherein the students can do activities progressively from easy to difficult tasks in Math. In my case, what I do is that I turned off that option so that the students can choose which tasks they would like to accomplish. There is a label in each task from easy, average to difficult. Options such as watching a math-related video, challenge activity, and tests. I give my students the freedom, because what if I have students who want to challenge themselves then they can try the difficult leveled tasks." (Interviewee 1)

Feedback has a significant effect on student learning if it is given as a timely and detailed information about what needs to be improved and how. In Schoology, teachers can freely annotate their students' papers and guide them on what steps to improve on. Through Schoology, teachers can give grades or feedback to evaluate work that is still fresh in students' minds before moving on to subsequent tasks. The teachers' description of their assessment decision and action in using Schoology underscores the importance of designing online assessment as a system, comprising several components to accurately evaluate student performance and achievement (Gaytan, 2004).

"Students would submit their work and homework online. Teachers can set the time, we can also see the time stamp on the students' submission. Their asynchronous tasks are all uploaded on the schoology, even the assessments are submitted on schoology. There is also a feature to see the history of their submission. Once we check their papers we can give them feedback because we can directly annotate on their papers, even the students, once they submitted their works/ tests they can put a note for the teachers like "I had a hard time doing this activity". (Interviewee 1)

Schoology provided support to teachers in strategically organizing activities and lessons around meaningful themes for students, which is a good practice in learner-centered teaching (McCombs & Whisler, 1997). All materials that are uploaded are accessible and are intended to develop and guide the students for learning.

"We use Schoology to post materials for each lesson, announcements, reminders, answer key, study guides, templates, journals, something to read about the lesson, assignment." (Interviewee 1)

Teachers also reported promoting reflective learning by letting students submit their Math journal through Schoology. In doing Math journals, students learn to construct arguments and critique the reasoning of others, as well as engage in mathematical communication, and personal reflection. Math journals provide opportunities for students to complete their learning tasks without the threat of being wrong, while teachers can use the assessment data to identify student misconceptions (Camahalan & Young, 2015).

"I make them feel that it's fine to make mistakes. How I say it matters a lot, they don't worry, it's okay, try again, it's fine, there are always important tools for them. I always remind them to use chatbox as much as they can." (Interviewee 2)

Aside from efficient delivery of online learning, teachers indicated that they also mentor students, by providing student guidance beyond the academic subjects. Through mentoring, teachers provide support and advice to students to facilitate stronger bonds and holistic development as part of the school formation program. Mentoring can promote better learning if it provides opportunities for students to articulate their viewpoints and shared decision-making about learning (McCombs & Whisler, 1997). It also provides a more personalized math learning experience for students, which in turn, facilitates better student engagement (Zweig & Stafford, 2016).

"The school offers the mentoring program and being a mentor allows me to become much more closer to them than the other students. Those little things help out a lot when you consistently and routinely do them. They see me not as a teacher only." (Interviewee 1).

4. CONCLUSIONS

ERT proved to be challenging and brought about changes in teaching and learning. As teachers transitioned to ERT, they focused on maximizing the use of available online learning tools to quickly create a platform for delivering learning. As they engage in ERT, they have to address the emerging issues related to student disengagement in online learning activities, while learning how to fully utilize specific features of the LMS to meaningfully organize content, create engaging learning activities, and provide feedback on student performance. And in using the LMS, the teachers demonstrated learner-centered practices related to using meaningful themes to organize content, provide opportunities for students to choose work at their own pace, utilize feedback as strategies for monitoring student progress and achievement, use Math journals to promote self-monitoring and self-regulation, and to create a nurturing relationship through mentoring.

Limitations and Future Research

The researchers encountered challenges in accessing, scheduling, and conducting interviews for additional participants due to the pandemic. Although the sample size is limited, the study focused on exploring various dimensions of the research focus by incorporating probe questions. Participants provided detailed responses to support study results. But further research can consider triangulating interviews with online class observations and detailed review or description of the LMS modules used by the teachers. Future studies can also identify what constitutes effective online elementary math learning and how teacher support can be improved.

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