Emergency remote teaching in low-resource contexts: How did teachers adapt?

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Abstract: The COVID-19 pandemic forced students and teachers to engage in emergency remote learning. Remote learning is particularly challenging for students and teachers in low-resource contexts. We aim to analyze the adaptation process of teachers who engaged in remote emergency teaching in low-resource contexts. We conduct ten interviews with teachers who provided emergency online teaching in Lebanon. We show that there was a decrease in synchronous student-teacher, student-content, and student-student interactions due to the scarcity of resources. We also show how the teachers adapted their practice to cope with these challenges, and how their adaptation process increased asynchronous student-teacher and student-content interactions.

Keywords: emergency remote teaching, low-resource, COVID-19, adaptation

1. Introduction

The COVID-19 pandemic forced teachers and students into a sudden transition to emergency online learning without prior preparation or guidelines. Recent reports highlighted the challenges of this transition and exposed a significant gap in teachers' readiness to use technology for remote teaching (Trust & Whalen, 2020). This transition has been particularly challenging and frustrating for teachers in developing countries or rural areas that have access to limited resources. In fact, teachers and students in low-resource contexts suffer from low internet connectivity, low Technological Pedagogical Content Knowledge (TPACK) (Mishra & Koehler, 2006), limited tools and financial support–which hinder their use of technologies to engage in remote education (Dalal et al., 2017; Mnyanyi & Mbwette, 2009). To deepen the understanding of the transition to emergency remote teaching in low-resource contexts, we aim to analyze the adaptation process of teachers practicing in those contexts during the COVID-19 pandemic. Our study uses Moore (1989)'s framework as an analytical framework for categorizing the effects of low resources on the adaptation process. Moore's framework proposes three interaction categories that are essential to online learning: student–student, student–teacher, and student–content interactions.

The purpose of this study is to understand the challenges that teachers in low-resource contexts faced when transitioning to emergency remote teaching, how they adapted their practice to cope with these challenges, and how the adaptation process affected the transactional relationships among students, teachers, and content.

2. Methods

We conducted ten structured interviews with university teachers in Lebanon. The participants were purposively selected to obtain a maximum variation sample in terms of teachers' characteristics (gender, institution, courses handled, and location). The interviews explored three questions: (1) the challenges that teachers face, (2) the strategies they employ, and (3) their general perception of emergency remote teaching. The interviews were recorded and transcribed maintaining anonymity. A thematic analysis was carried out following the guide of Braun & Clarke (Braun & Clarke, 2006). After drafting the coding schemes, we identified the themes and divided them into 1) resource-related issues 2) the related challenges that teachers face, 3) which student-teacher-content interactions are affected, 4) the strategies employed to deal with the challenges, and 5) the effect of the adaptation process on student-teacher-content interactions.

3. Results

The adaptation process of the teachers is shown in Figure 1. Two main resource-related issues were identified: low internet connectivity and lack of TPACK. These limitations imposed a decrease in three synchronous student-teacher-content interactions. To counter this decrease, the teachers adapted strategies that increased the asynchronous student-teacher and student-content interactions. However, the decrease in student-student interaction was not addressed.
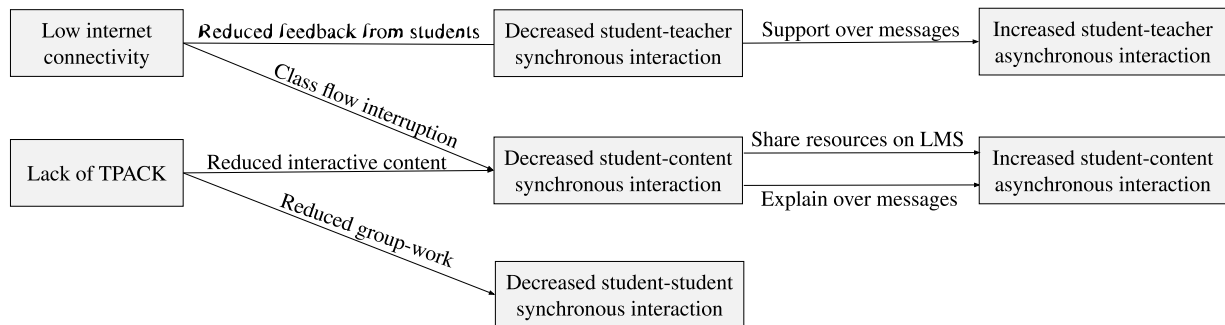
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┌──────────────┐  Reduced feedback from students  ┌──────────────────────┐  Support over messages  ┌──────────────────────┐
│ Low internet │─────────────────────────────────▶│ Decreased student-   │────────────────────────▶│ Increased student-    │
│ connectivity │       Class flow interruption     │ teacher synchronous  │                          │ teacher asynchronous  │
└──────────────┘                                    │ interaction          │                          │ interaction           │
                                                    └──────────────────────┘                          └──────────────────────┘

┌──────────────┐     Reduced interactive content   ┌──────────────────────┐  Share resources on LMS  ┌──────────────────────┐
│ Lack of      │─────────────────────────────────▶│ Decreased student-   │────────────────────────▶│ Increased student-    │
│ TPACK        │       Reduced group-work          │ content synchronous  │   Explain over messages  │ content asynchronous  │
└──────────────┘                                    │ interaction          │                          │ interaction           │
                                                    └──────────────────────┘                          └──────────────────────┘

                                                    ┌──────────────────────┐
                                                    │ Decreased student-   │
                                                    │ student synchronous  │
                                                    │ interaction          │
                                                    └──────────────────────┘
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Figure 1. How teachers adapted to emergency remote teaching in a low-resource context

Decrease of student-teacher synchronous interaction: Due to bandwidth limitations, the teachers encouraged the students to disable their video when using videoconferencing platforms. This led to a decrease in audio-visual feedback from the students and consequently to a decrease in student-teacher synchronous interactions. Teachers reported having the feeling that they are talking to themselves and that they could not assess the engagement and comprehension of the students while giving their lecture.

Increase of student-teacher asynchronous interaction: To compensate the decrease in student-teacher synchronous interaction, the teachers increased the asynchronous student-teacher interaction. Teachers reported sharing their personal contact information with the students to provide them with extra support. This required the teachers to extend their availability and provide support during non-working hours.

Decrease of student-content synchronous interaction: Frequent connection failures, digital lags, delays and echoes, reduced the content delivered through the lecture as teachers tended to speak slower and often had to repeat themselves. Due to lack of interactivity during the online class, we considered that the activity of watching the lectures online fall under the student-content interaction. Moreover, due to a lack of TPACK, teachers were unable to adapt all their usual classroom content and deliver it remotely. The contents that are usually provided during the class like group case solving, or readings were removed from the synchronous classes because teachers could not supervise the work.

Increase of student-content asynchronous interaction: To counter the decrease in synchronous student-content interaction, teachers shared additional resources on the Learning Management System.

Decrease of student-student synchronous interaction: Due to the lack of TPACK, the teachers had a limited knowledge of online tools and features that allow synchronous group work between students. Consequently, student-student synchronous interaction decreased during emergency remote learning.

4. Conclusions

Our study showed that the main challenges that teachers faced when providing remote emergency teaching in low-resource contexts resulted from low internet connectivity and lack of TPACK. These challenges translated into a decrease in synchronous student-teacher, student-content, and student-student interactions. The strategies that the teachers employed to cope with these challenges increased asynchronous student-content interactions and student-teacher interaction, which is the most important interaction for students' engagement (Martin & Bolliger, 2018). However, the student-student interaction could not be salvaged even though it can increase students' engagement and reduce the sense

of isolation (Abrami et al., 2011; Banna et al., 2015). Our findings align with recent work that showed that despite teachers' unpreparedness for emergency remote teaching, they somehow managed to make online learning work (Gudmundsdottir & Hathaway, 2020). The rapid adaptation may have been catalyzed by the previous experiences of the teachers who are used to continuous crisis marked by rapid change and uncertainties (Khalifé & de Montmorillon, 2018) and their resilience and ability to harness contextual resources to effectively navigate through emerging challenges (Beltman, 2015).

To accommodate teachers' transition to emergency online teaching in low-resource contexts, further research is needed to understand the situated needs of the teachers. These situated needs can be identified by looking at how teachers appropriated the existing technologies and used them in ways that were not intended by the original designers (Carroll, 2004; Helou et al., 2019). Moreover, past research showed that in low-resource communities, the socio-economic situation of the student majorly affects their access to ICT tools and to a positive learning environment at home (Abou-Khalil et al., 2019). To help teachers accommodate their students' transition to emergency online learning, equity and poverty education needs to be integrated into the teachers' professional development programs (Rowan et al., 2019). Finally, educational planning in emergencies needs to build a functional remote educational system that allows the teachers, independently of resource availability, to foster all types of transactional interaction between themselves, their students, and their content.

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