

FACILITATION TECHNIQUES AND TOOLS FOR ONLINE PROJECT-BASED LEARNING WITH PRIMARY SCHOOL STUDENTS

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Abstract

Current trends indicate that more schooling will take place online, including project-based learning (PBL). This shift opens new possibilities for interactions and collaborations among students, allowing for glocalization of learning and connectivism across international classrooms. The last two years have shown that many well-established techniques/tools for facilitating PBL in physical classrooms are not simply transferable to the online space. Thus, techniques/tools for online facilitation need to be explored, adapted, and newly developed, whilst considering existing pedagogical principles. We conducted three case studies lasting approximately 3 months each, in which primary school students (Grade 5-7) from Namibia, Malaysia, and Finland collaborated in online sessions. Throughout these studies we focused extensively on the facilitation process, exploring different techniques/tools with a trial-and-error approach. We were guided by our own experiences in facilitating and teaching within physical classrooms, and continuously reflected on the adaptation to online settings, whilst consulting theoretically-proposed and empirically-supported suggestions from various fields. For each case study, we video recorded the planning of the sessions, the sessions themselves, and the reflection afterwards. In addition to analyzing these videos, we also drew upon focus group interviews that were conducted with students at the end of the studies. Based on this data, we present facilitation techniques/tools, including the structuring of sessions (e.g., the importance of icebreakers, variety in activities, and navigation of digital tools), as well as aspects relevant to the climate (e.g., student-student interactions, facilitator-student interactions, autonomy, role distributions, and language). With the presentation we offer researchers and educators practical techniques/tools, as well as important aspects to consider when facilitating primary school students in online project-based endeavors.

Keywords: *Facilitation, project-based learning, online, primary school.*

1. Introduction

With more schooling taking place online, including project-based learning (PBL) which has a unique ability to increase students' motivation (Hira et al., 2021), effort should be invested into establishing appropriate facilitation techniques and tools. This includes exploring which can simply be transferred or adapted from those used in physical classrooms, but also identifying which no longer work and developing new techniques and tools. Although a few scholars have started looking at online facilitation strategies in higher education (Martin et al., 2018; Thomas & Thorpe, 2019), they differ from approaches in primary education, which is the focus of our research. Furthermore, we maintain that facilitation techniques and tools for online PBL should in part be driven by established pedagogical practices that are embedded in educational theories and empirical studies.

2. Method

Starting in 2020 we embarked on a larger research project, with the aim to explore how students from around the globe may work together in collaborative online learning environments. We focused on numerous aspects, including the required technology, transcultural perspectives, pedagogical approaches, and facilitation techniques within the ongoing case studies. These are embedded within an overall shift to

transform schools into connected knowledge hubs, whereby student-centered learning is central, with students collaboratively constructing new knowledge. The project team now consists of a group of multi-disciplinary researchers from Namibia, Finland, Malaysia, and Germany. We conducted three case studies in which primary school students (Grade 5-7) collaborated on projects lasting approximately 3 months. The students in Finland and Namibia were chosen from schools which had long-term partnerships with the local universities, and in Malaysia a new school was contacted about starting a collaboration; teachers selected which students would take part in the case studies. The students from each country knew each other (being from the same class or extra-curricular activity), but did not yet know the students from the other countries. Within each case study, we iteratively held planning meetings, conducted the sessions, and held a reflection meeting, which were all video recorded. For the current paper we focus extensively on the facilitation process, reporting on different techniques/tools that we applied in the case studies with a trial-and-error approach. We were guided by our own experiences in facilitating and teaching within physical classrooms; we continuously reflected on the adaptation to online settings, whilst consulting theoretically-proposed and empirically-supported suggestions from various fields. In addition to analyzing video recordings, we also drew upon focus group interviews conducted at the end of each case study, and reflection diaries that were completed after some sessions.

2.1. Case study 1

The aim of the first case study was to facilitate the online co-creation of an interactive map between ten primary school students situated in Namibia and Finland (Rötkönen et al., 2021). Over nine sessions, the students (with the help of a developer) created a prototype that allows students to learn and exchange information about their countries within the context of a team-based game. For the sessions we utilized Skype, Microsoft Whiteboard, and an online VR environment. The sessions were facilitated by members of the research team, which included one online facilitator situated in Germany, two facilitators situated in Namibia, and one facilitator situated in Finland. The students in Namibia and Finland knew the facilitators present in their country.

2.2. Case study 2

The aim of the second case study was to facilitate the co-creation of an online platform that allows students to share local perspectives on global challenges (e.g., climate change, cyberbullying; Winschiers-Theophilus et al. 2022). Much focus went into exploring preferred modes of communication, as well as identifying challenges and solutions, in order to design an integrative platform. Six primary school students from Namibia, Finland, and Malaysia collaborated in the six online sessions. Furthermore, they were involved in four separate sessions with their schoolmates ($n_{\text{Namibia}} = 24$, $n_{\text{Finland}} = 16$, and $n_{\text{Malaysia}} = 23$); in Namibia and Finland these took place in a physical classroom, and in Malaysia these were held online. We also held an online closing session, to which all the students were invited. For the sessions we used Skype, Jamboard, and Miro. The facilitators were the same as in case study 1, with two new facilitators situated in Malaysia joining. The students in Malaysia did not know the facilitators joining from their country, and because they joined online (from home) the facilitators were not physically present with them in a room.

2.3. Case study 3

The aim of the third case study was to facilitate the co-creation of an online space in which students from different countries can interact and work together (e.g., on projects). Working with a group of developers, an individualized and multi-functional online space station was created (Zaman et al., 2022). Six primary school students from Namibia, Finland, and Malaysia collaborated online in five sessions, and were also involved in four separate sessions with their schoolmates ($n_{\text{Namibia}} = 24$, $n_{\text{Finland}} = 14$, and $n_{\text{Malaysia}} = 23$). For the sessions we used Ohay and Miro. The facilitators were the same as in case study 2. The students in Namibia and Finland again joined from school, whilst those in Malaysia joined from home.

3. Results and discussion

3.1. Icebreakers

Throughout the case studies, we began to realize the importance of beginning each session with an icebreaker that is specifically tailored to the technology and activities entailed therein. Successful icebreakers included (1) playing *Pictionary* to get acquainted with Microsoft Whiteboard, Jamboard, and Miro, (2) playing *Simon Says* to get acquainted with communication cards (i.e., pictorial cards that include short messages, e.g., I want to say something, I can't hear you), (3) playing *Charades* to reflect on body language, (4) playing *Musical Chairs* to reflect on virtual space, and (5) completing the *Alternative*

Uses Task to encourage creative thinking. The icebreakers thus served as an alternative to providing students with a training of the technology and the methods before the sessions. Furthermore, we believe they contributed towards a positive climate, as they fostered communication between the students and were perceived by the students as being fun. In the interviews and reflection diaries, students often noted that the icebreakers were what they liked most about the sessions (e.g., “the warm up was fun”, study 2).

3.2. Online Navigation

Having a plethora of applications in which we had to “switch” within sessions was quite cumbersome. Even in the later studies in which only one platform was utilized, students opted to communicate via video and microphone, using the chat function, sending fleeting emojis, or drawing and writing on a shared board. The online facilitator thus had to stay on high alert to all forms of communication, ensuring that no students suggestions went under; this also meant reading out loud the written communications, to keep the other students who may not have noticed the chat message informed about their fellow students' responses. Although this requires effort, we believe that keeping all forms of communication open is important, as previous studies have indicated that the use of text chat and social media within online learning environments allows more quiet students to be heard (Nowell, 2014), and that offering students multiple ways to contact instructors is an important facilitation technique in online courses (Martin et al., 2018). Furthermore, the students joining the sessions from home often had their videos/microphones off; to ensure that they remained involved and offered contributions, these students were continuously prompted to respond on the chat. Difficulties related to technical failures were addressed amongst the facilitators, but also with the students themselves. For instance, we observed that when students did not audibly hear what was being said, they did not indicate this to the talking student or the facilitator. We thus dedicated sessions to exploring options to overcome this challenge. The students suggested writing messages in chat, using expressive emojis, as well as showing visual communication cards. Making notes during the sessions in Study 3, the facilitators were able to ask the technical developers to create new functionalities and items that would ease the facilitation; for example a virtual microphone which could be passed on (similar to a talking stick), and a laser pointer that students could use to draw attention to something on the screen (as their cursors were not visible).

3.3. Student-Student Interactions

In the first study we had ten students in total, with each set joining the sessions with a single video camera and microphone. Throughout the study we realized that the size did not allow each student to contribute equally, and that the students did not thoroughly get to know each other (e.g., not knowing each other's names halfway through the study). In the second and third study we opted for six students. In the third study each joined the sessions with their own camera (even when being located at the same place), which eased the facilitation process immensely. In the closing session the Namibian and Finnish students joined as a group from one camera, with the Malaysian students noting that they would have also preferred this. All our case studies included getting to know each other activities, in which students shared information about hobbies, favorite foods, etc. At the start of case study 2, we planned to have the students who were in the online sessions facilitate the sessions with their schoolmates; their tasks were to report back what had happened, to repeat some of the activities with their schoolmates, and to gather new ideas and information. However, we soon realized that the students struggled with this peer facilitation, and moved to a format of co-facilitating. Guided by principles of classroom climate (Wang & Degol, 2016), we continuously aimed to create a safe and respectful environment by encouraging positive interactions amongst the students. Although this occurred somewhat naturally, it was good to hear the students confirm in the interviews that they were able to have quality interactions, e.g., “They were really nice people and it was really really nice to get to know new people and work with them” (study 2), “I think they have interesting ideas” (study 3). The only critical experience was during the closing session of study 3, in which individual students laughed and made unfiltered comments during the presentations. We are unsure whether this was due to these students not knowing the etiquette of the online sessions, or because they did not have a physical facilitator present (which we strongly recommend).

3.4. Autonomy

The students and their ideas and opinions were central in all three studies; hence, we provided students with ample choices and opportunities to provide suggestions in order to enhance their feelings of autonomy and ownership (Ames, 1992). Despite this we also came to realize that most activities required the presence and guidance of a facilitator; in an attempt to minimize the role/contribution of the facilitator, we included one activity per study for the students to complete by themselves. From the view of the facilitators, we thought that this did not work well; for instance, students did not begin spontaneous communication and in most cases one student took the lead, and without major input from the others

made decisions. The students reported in the interviews the need for a facilitator, but at the same time maintained that unfacilitated activities were needed and would work; “It would have gone all mixed if there was no facilitator...so giving us the instructions and we do it ourselves”, “If needed you should take the control yourself and start the conversation if there is no one else to do it and it will go on when the conversation starts ... the other will come along...You have to start it”. Hence, it seems that the students did not perceive the unfacilitated activities as uneasy as the facilitators did. Especially in study 3 we spent much time exploring students’ autonomy, by exploring their suggestions for facilitating and structuring the online space. Similar to the setting of classroom rules, students were tasked with creating their own guidelines for online interactions (e.g., give everyone a chance to talk, no spamming, and don’t erase other people’s work). Furthermore, we spent one entire session enquiring about students’ preferences for the spatial setup and facilitation techniques, such as where the facilitator and student video frames should be placed, method for choosing order of presentation, and structuring Q & A. Directly asking the students (receiving feedback) and utilizing feasible suggestions was also useful for the facilitator.

3.5. Role distributions

Throughout the studies we also noticed that students differentially contributed during the sessions; with some being more open and proactive, whilst others were more quiet and reserved. Although the power imbalance between facilitators and students is often noted, the naturally occurring power imbalances between students is not addressed enough (Van Mechelen et al., 2015). In order to address these in our studies, we opted for unofficial role distributions based on observed talents and mode of communication. For instance, one student who was talented in drawing (i.e., named drawing as one of her hobbies, and did a meticulous job early in the first sessions) was tasked with drawing the oral suggestions provided by the more outspoken students. In the third study, one student showed great promise in technical skills; he thus received a private lesson on developing in the online platform Ohay, and in one of the sessions was tasked with immediate implementation of students’ suggestions (e.g., size and location of video frames).

3.6. Facilitator-student relationships

Similar to how student-teacher relationships are vital in physical classrooms, so is the relationship between students and facilitators in online PBL. Although we acknowledge that the amount of time for each case study is not merely enough to truly establish a strong relationship, we continuously aimed for this. Exchanges between the facilitators were useful, as those who knew the students better could provide insights that could inform facilitation. For instance, knowing that one student requires more time to formulate answers, guided the facilitator to not pick this student first. Furthermore, the online facilitator also provided personal information (e.g., favorite animal); in later sessions the students would then also direct questions at the facilitator (e.g., what food is eaten in Germany?). The facilitator ended each session by informing the students that she valued their contributions.

3.7. Language

English is the language of instruction in both the Namibian and the Malaysian schools. In the second and third study, we specifically chose students in Finland who had a good grasp of English, which led to the online facilitator not always realizing that they were still challenged by the language aspect. The Finnish facilitator had to keep reminding the group about this. When asking the Finnish students in the interviews, they noted that they did not mind the sessions being in English and that they enjoyed having an opportunity to practice their English. Nonetheless, when asked about general challenges they mentioned their lack of vocabulary and issues with correct pronunciation, but noted how they managed well despite this, “It was really difficult because English had to be really good, to understand what they say, and you had to know what to say if you didn’t know what something means – what the word is in English so you get panic. But it went well...” (study 2), “If there were some words you didn’t understand then you asked or tried in a similar way or like use gestures to understand” (study 3). The Finnish facilitator continuously supported the students during the sessions, providing them with translations and answering their questions. Furthermore, they were given the option to complete the interviews and the diaries in their preferred language.

3.8. Structuring sessions

As the complexity of the projects increased, the students started noting in their diary that they were getting confused. This prompted us to begin each session with a verbal reminder of the overall aim of the project and a description of the activities that will be completed within the sessions including the reasoning or desired outcomes of these. Thus, simple strategies for effective lesson planning utilized in physical classroom settings, such as sharing learning objectives and explaining specific learning

activities, remain essential for online PBL. Within the sessions it was important for the facilitator to reiterate instructions and help students navigate through the different platforms or spaces; the students positively commented on this in the interview, “there was Naska giving advice like all the time, so like what the next activity is and next we go to another room in that app, and it was nice to together with all” (study 3). Another frequent facilitation technique involved summarizing students’ responses; we found this form of paraphrasing quite useful, as it offered clarity for the facilitator and the other students (i.e., repetition for understanding and clearing of misunderstandings), as well as providing the student with feedback that what they are communicating is being heard and taken into consideration. To provide a balance and encourage different interactions, group sizes were varied for different activities. When students were actively completing tasks but were not communicating with each other, the facilitator narrated their actions to encourage the students to consider what the others were doing. Due to the logistics of bringing children from three different countries together, we opted to have each session last 60 minutes, and although having short breaks some students noted that this was too long.

4. Conclusion

Similar to teaching in physical classrooms (Stahnke & Blömeke, 2021), the online facilitation of students partaking in PBL requires practice. We highlight that some strategies are directly transferable from physical classrooms whilst others require reimagining. With this summary we hope to offer researchers and educators practical ideas and solutions for the online facilitation of PBL.

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