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Social Mobile Learning For Education For Sustainability (EfS)

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ABSTRACT

The purpose of this paper is to evaluate the potential use of videos for peer-to-peer learning for education for sustainability (EfS). Despite the need for more cognitive learning to solve complex sustainability issues, understanding of using social learning through modern communication methods such as social networks for knowledge co-creation in EfS is unclear. This pilot study conducted in a Thailand university used mobile videos to pitch sustainability solutions and facilitate peer engagement. Conducted on a private social network, Soqqle, students were encouraged to watch videos from each other and add comments. Post-course focus groups indicated a sense of collective efficacy as participants' sense of self-efficacy contributes to group effects that impact participations. Several observations were noted based on these focus groups which provided hints on what encouraged students to watch the content of their peers in a productive manner. Characteristics such as self-efficacy, or the lack of it, did cause students to disregard content and comments from others. Participants also discussed and explored potential opportunities to enhance the video activity to better scaffold the learning to build self-efficacy. Overall, results show the potential of incorporating a community of inquiry environment to encourage peer review and feedback. This study is significant due to its timeliness to leverage digital solutions to increase collective efficacy. Educators planning to introduce social learning in sustainability topics can incorporate findings from this study to facilitate effective learning outcomes for EfS.

KEYWORDS: social learning, peer to peer learning, education for sustainability, business pitching, community of inquiry

1 INTRODUCTION

According to OECD (2019), educational systems are shifting towards topics such as civic literacy, global awareness, cultural diversity, and environment awareness in light of the sustainable development goals (SDGs). Studies in education for sustainability (EfS) have called for authentic learning to bring in real-life experiences (Hermann & Bossle, 2020), and connected learning (Salovaara et al., 2021) to bring students closer to problems. According to Luna-Nemecio et al. (2020), solving age-old sustainability issues requires complex thinking and community-level solutions. Despite the recommendations, there is little understanding of how sustainability education can help contribute to the implementation of solutions that involve collective problem-solving or efficacy. Furthermore, to effect peer-to-peer engagement, students have demanded more use of modern technology methods like mobile videos in social networks (de Lima et al., 2019). This extant gap in knowledge has therefore motivated this study in which students in Thailand formed teams to create a sustainability-related product pitch using mobile videos on a private social network, Soqqle. Once the mobile videos were uploaded, students could watch the content of their peers to co-create solutions. The goal of this study was to investigate the use of social learning using mobile videos in a social network. The perceptions of students were examined, as well as their ability to extract affective and cognitive learning. In addition, potential cultural influences were also examined as part of the study.

2 LITERATURE REVIEW

Problems related to sustainability have been described as “wicked” with no clear solutions (Chen & Liu, 2020; Lotz-Sistka et al., 2015). As a result, simply depending on knowledge gained in lectures is not sufficient for students to develop the necessary skills to solve these problems (Fischer et al., 2012; Olsson, Gericke, Sass, & Boeve-de Pauw, 2020; Sass et al., 2020; Schrader & Lawless, 2004; Shephard et al., 2015a). According to OECD (2018), learning methods need to transform and adopt more cognitive and metacognitive skills. To do this, Salovaara et al. (2021) recommender that students learn through an interconnected approach of local, nature, social, individual, culture and global mindsets. The authors also provided empirical evidence that students who adopted this holistic style of learning had a broader sustainability study experience. In another study, Hermann & Bossle (2020) recommended active learning methods such as problem-solving using activities commonly seen in entrepreneurial education. The authors highlighted that students need more hands-on experience by being involved in real-world problems.

Having real world perspectives is a key part of authentic learning, and it has been recommended that authentic learning be embedded in teaching and learning to enhance higher order thinking in sustainable development (Istenic Starcic et al., 2018). The study of authentic learning often refers to providing students the opportunity to practice their classroom learned concepts to real-life scenarios (OECD, 2019). However, according to Farrell (2020), authentic learning can be assessed through factors such as creating varying experiences, collaborations, and opportunities to create a product or performance. Knowledge and evidence of the applications of these factors in learning methods are lesser known. In one example, Bendickson et al., (2020) found that students who took part in innovation pitches reported increased collaboration and problem solving as they looked at real life problems and came up with ideas for solutions. Despite these encouraging studies, cognitive and metacognitive learning often requires a form of authentic peer to peer learning (Sharma & Potey, 2018), for which the application in EfS is lesser known. The use of social learning theory may help as studies have indicated that experiential learning and social learning can

increase cognitive and affective skills (Gweon, 2021). The use of social learning is also timely with the popularity of social networks as students also prefer such tools in the classroom (de Lima et., 2019). However, low participant in social networks used in education contexts (Callaghan & Bower, 2012; Cavus, Sani, Haruna & Lawan, 2021) due to low purpose or utility has been reported, and its applicability in EfS requires further investigation. Thus, this study aims to examine student perception of a novel learning method that incorporates social learning into EfS to boost authentic cognitive and affective learning.

The use of inquiry-based learning has been shown to be effective in creating sustainability awareness in the classroom (Kalsoom & Khanam, 2017). Garrison & Akyol (2015) recommended the use of communities of inquiry (CoI) to influence metacognitive and co-regulation through social, cognitive and teaching factors. Within the communities of inquiry framework, students collaborate with one another using self-perceived and self-defined responsibilities. In this context, students and peers learn from both individual as well as group perspectives. To extend the literature, this study will incorporate the following CoI elements into a EfS context: i) social presence for participant engagement ii) cognitive presence for content engagement iii) teaching presence for goals engagement. According to Glassman et al. (2021), the implications of CoI extend to collective efficacy for which engagement and problem solving can occur. Thus, potential effects of collective efficacy will also be studied. This will be supported by game design elements by Mochizuki et al. (2021), authentic learning assessments (Farrell, 2020), as well as cognitive and emotional development (Plass & Kaplan, 2016; Ninaus et al., 2019). These elements are described further below.

2.1 Teaching presence for goals engagement

According to Kwee (2021), it is difficult to create student interest in sustainability topics due to sustainability being perceived as ‘irrelevant’ to the curriculum, as well as students feeling that they are unable to create an impact. The author further said that students are better motivated by incorporating real-life scenarios and encouraging discourse with peers. This is in line with recommendations by other research (Hermann & Bossle, 2020; Farrell, 2020) that designing problem-solving experiences for students in real world scenarios can make learning more authentic. In this context, the role of play, or gamification, has been suggested as an important element toward developing critical thinking, collective creativity, and problem solving (Tang et al., 2020). Games have also been described as a suitable way for students to better personalize their learning goals and pace (Toh & Kirschner, 2020), thereby creating a way for them to self-direct their learning process. Furthermore, the relationship between self-directed learning and problem solving has been studied (Loyens et al., 2008) and proven to be effective for sustainability education (Noordegraaf-Eelens et al., 2019).

One type of gamification of increasing interest (Hallinger & Wang, 2020) is the use of simulations, which can deliver real world and authentic experiences (Qian & Clark, 2016; Farashahi & Tajeddin, 2018), as well as asynchronous off-classroom engagements (Featherstone & Habgood, 2019; Robertson et al., 2021). Despite the benefits, a majority of simulations are usually done in vivid immersive environments that require high setup, user training, limited customization, and require significant planning to stimulate student participation (Delahunty, 2018). As students prefer more familiar methods like social networks to engage (Lima et al., 2019) and view content from peers, this study aims to create a simulation method on a social network to encourage self-directed learning for sustainability education.

2.2 Social Presence for Participant Engagement

One other challenge noted by Pennington (2016) is the successful integration of knowledge in interdisciplinary teams, and a key focus needs to be on creating connections between the knowledge held by people of different disciplines. The author also said that knowledge sharing must enable comprehension of complicated concepts and encourage reflection in addition to connection building (Pennington, 2016). Cincera et al. (2018) noted the importance of group dynamics, and social learning processes had to create supportive and trustful atmospheres among the participants. One recent sustainability-focused simulation used role-playing to allow participants to engage with peers with different goals to be able to learn diverse perspectives (Mochizuki et al., 2021). The authors reported evidence of complex thinking, collaboration, and that the participants were able to reflect on real world implications (Mochizuki et al., 2021).

These findings were quite similar to studies on team learning and shared mental models. Van den Bossche and colleagues (2018) defined shared mental models as shared representations of tasks, working relationships, and situations. According to previous research, all these types of knowledge need to be shared in effective teams for them to perform at a high level (Matheiu et al., 2005; Matheiu et al., 2000; Van Den Bossche et al., 2018). Empirical studies found a positive link between the sharedness of mental models and team performance (Mathieu et al., 2005). Similar to the findings of interdisciplinary team research (Cincera et al., 2018; Pennington, 2016), Van Den Bossche et al. (2018) stated that differences of opinion within a team need to be discussed constructively and viewed as opportunities as opposed to threats. The authors also stressed the importance of a shared mental model within a team, and teams with a shared mental model performed better, though the perceptions of the teamwork by the different members did not always match with the level of the shared mental model (Van Den Bossche et al., 2018).

A shared mental model can further be developed into collective efficacy which defines the groups' shared belief in its ability to achieve its goals (Bandura, 1963; Bandura, 2000). Glassman et al. (2021) postulated that the social influence, engagements and collaboration influence collective efficacy to create engaged, productive online communities, particularly in mass media such as social networks (Bandura, 2001). In the context of education, while collective efficacy has been previously shown to increase participation and motivation (Wang & Hwang, 2012; Remesal & Colomina, 2013; Goggins & Xing, 2016), investigations that use modern social network features like user-generated content and comments in relation to collective efficacy are lacking. Finally, while effects of collective efficacy have been proven to increase cohesion (Pabayo et al., 2020) and creativity (Zhang et al., 2011) in sustainable development concepts (Chen, 2015; Brunstein & King, 2018), its use in modern social networks requires more investigation.

Furthermore, opportunities to create a product as well as to collaborate with others are essential elements of authentic learning (Farrell, 2020). This is in line with a sustainability focused innovation contest (Greco et al., 2021) for which participants that took part in a design-thinking bootcamp that involved reported deep problem-solving and increased collaboration. This is also in line with entrepreneurship related recommendations (Hermann & Bossle, 2020) as students have direct exposure to their selected problem domains. With these aims in mind, one of the goals of this study was to examine the impact of introducing innovative product pitches in a collaborative and social learning supported learning environment.

2.5 Cognitive presence for content engagement

It has been argued that emotions affect all aspects of cognition, particularly in the case of memory attention and learning (Ninaus et al., 2019). There is increasing evidence that learners who do not feel emotionally engaged begin to disengage on the cognitive and behavioral level (Finch, Peacock, Lazdowski, & Hwang, 2015). Theories of learning with multimedia have increasingly considered emotions to be more crucial and emphasized that learning through multimedia should focus solely on cognitive aspects. Mobile videos, a common feature in social networks, have shown to provide realistic, cognitive-driven experiences and are able to affect emotions (Alemdag & Cagiltay, 2018; Sander & Nummenmaa, 2021), thus it might be a suitable method for allowing students to enhance their learning performance.

Plass & Kaplan (2016) argued there is an inseparable association between cognitive and emotional processes during learning. Despite the importance of emotional learning, a study by Cebrián & Junyent (2015) on student teacher perceptions on sustainability education indicated that students in their study disregard emotions, like a sense of belonging with the environment. The study suggested that student teachers did not focus on promoting reflection or awareness of emotional aspects. In fact, most of the teachers prioritized knowledge and practical skills for sustainability, to the detriment of other types of learning, such as management of emotions (Cebrián & Junyent, 2015).

On a related note, Plass & Kaplan (2016) noted that a number of different design elements can impact situational interest experienced by the learner. Ninaus et al. (2019) said however that the underlying mechanism by which games or game elements engage learners and promote learning is still unclear. They recommended that research focus on defining the zone of optimal emotional engagement to foster learning outcomes and emphasized that learners should not be distracted by too many emotional reactions or overload. Further research on role-play learning has also highlighted the importance of optimal emotional engagement, as several authors have noted that too much stress and anxiety can detract from the learning experience for students in role-play games (Sogunro, 2004; Taylor, 2018).

With the above discussions, the following research questions were investigated:
1. How did students perceive the social learning involved when watching pitch simulation mobile videos in a collective online social setting?
2. Which part of the learning activity (creating the videos, watching the videos, commenting on the videos) was most useful for the student learning?
3. What differences (if any) were there in the perceived learning outcomes between different intercultural learners?

3 METHODOLOGY

For this research, the focus was on a product pitch part of the course using a purpose built private social mobile application and how social learning conducted on the application contributed to enhance student learning outcomes.

3.1 Participants

The participants were from a class of 80 students who took part in a course on creativity and communication. The participants in the focus groups were both Thai and international students enrolled in the creativity and communication course taught in English. Most of the students were Thai, but there were several students from Myanmar, Cambodia, and China. Students represented two different faculties at the university. The study took place

in late October 2021, a few months after the students had completed the course and video activity.

Since there were both international and local students, focus group participants were split into two groups based on their nationality. Group 1 was composed of international students while Group 2 were Thai students. This was to ensure that students were comfortable to participate in the discussions and that any similarities or differences in their perspectives between the groups could be highlighted for further investigation.

3.2 Materials

Students recorded videos on their mobile devices and used their respective authoring tools (such as Tiktok or IG) to edit the videos. The videos were then transferred to their mobile devices and uploaded to the private social media application, Soqqle (https://soqqle.com), used in multiple institutions in Asia, where users can "post" images or videos as well as add personal comments on these submissions. Prior to the simulation game, a code-name was created on the Soqqle mobile application and given to the students through email. Students subsequently downloaded the Soqqle mobile application on the Android playstore or IOS app store and entered the code-name into the application to join the game. The code-based protection of the platform provides a private and safe environment where students can share their ideas and engage with others anonymously.

Throughout the game, students were expected to collaborate in their preferred applications such as LINE (https://line.me/en/), while actively commenting on the other product pitches that were posted by the other student groups on the Soqqle platform. It was assumed that students would learn from reading comments to their videos from their peers, as well as the comments provided by the instructors, and this was investigated further as part of the focus group discussions.

3.3 Design & Methodology

The course that was selected for this study focused on teaching students about creativity and applying creative solutions to significant problems in the world, many of which relate to socioeconomic issues. In the course, students worked in groups of 6-8 to research a problem that was significant to their group, and then produce a video on the problem based on their research. Afterward the group created and tested a prototype that addressed the problem they depicted in their initial video, before doing a final product pitch of their prototype to communicate how it would help address the problem. Due to the size/scope of this work, the students were encouraged by the instructors to divide the work into different roles in order to help the teams work more cohesively together.

To collect data, the study organized the focus groups at the end of the semester. The focus groups were transcribed and coded based on Colaizzi's Strategy, which has been used in subjects (Park et al., 2018) with phenomenal nature such as communication and social behavior. Colaizzi's Strategy is based on an inductive and interpretative approach to identify significant meaning, cluster common themes, and create a fundamental structure. In the context of this study, the use of authentic assessment framework and experiential learning was adopted to help with theme identification. These are described below.

To validate if students experienced authentic learning, the study adapted an authentic learning simulations framework by Farrell (2020). Participants were evaluated based on the i) level of challenge ii) ability to create performance iii) experience of collaboration iv) sense of realism v) observation of varying experiences vi) obtained knowledge that can be transferred vii) opportunities for reflection. A more thorough description is provided in appendix A.

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It is worth noting that at the start of each focus group, where the session was recorded, the students were informed of the purpose of the study, and that their responses would be selected and cited anonymously. Verbal permission was gained from the participants before proceeding with the focus groups.

3.4 Procedure

Students worked in groups to produce 3 projects related to socioeconomic issues and sustainability. As the course was about creativity and communication, the students were expected to focus on developing not only their creative thinking, but also their communication skills through video projects and presentations. A major element of this course was self-directed learning and reflection. The instructors for the course acted as facilitators, and half of each class was dedicated to allowing students to do self-directed learning within their own groups. Several group tutorials were also arranged throughout the course so that students could get feedback on their work and ask the instructors questions.

At the end of the course, the two focus groups were conducted with 2-3 students in each group. One group was conducted with Thai students (Group 1) while another group was done with international students (Group 1). The focus groups lasted about 45 minutes each and were done over the video-conferencing application, Microsoft Teams.

An independent coder then transcribed the responses from the focus groups, and proceeded to identify significant sentences, exclude sentences with similar meaning, and normalized representative phrases per participant. Categories were identified based on common underlying concepts to formulate common themes. For phrases that were related to cognitive or affective outcomes based on the observation of peers, they were further scored (1-3 on Likert scale) on their depth of higher order thinking.

4 Results

The following section will outline the results of the two focus groups. Overall, the two focus groups generally agreed on the value of social learning, but did express some potential future improvements to the learning method that differed depending on their perceptions of the whole learning experience. This will be discussed more below. The section discusses overall authentic assessments first, followed by reflection responses from the students which were further coded into cognitive and affective types following the experiential learning model. Finally, additional coding on the reflection phrases was. Based on the focus group codings, three key themes of self-efficacy, group effects and challenges were identified.

4.1 Videos creation

8 videos were created as part of the tasks and uploaded on the Soqqle app (Figure 1). Some of the issues depicted were fast-fashion, infrastructure issues, and cyber-bullying. When the videos are posted on Soqqle, the application sends a push notification to all other participants on their mobile phones. When the push notification is tapped, Soqqle opens and allows the participant to view the video.

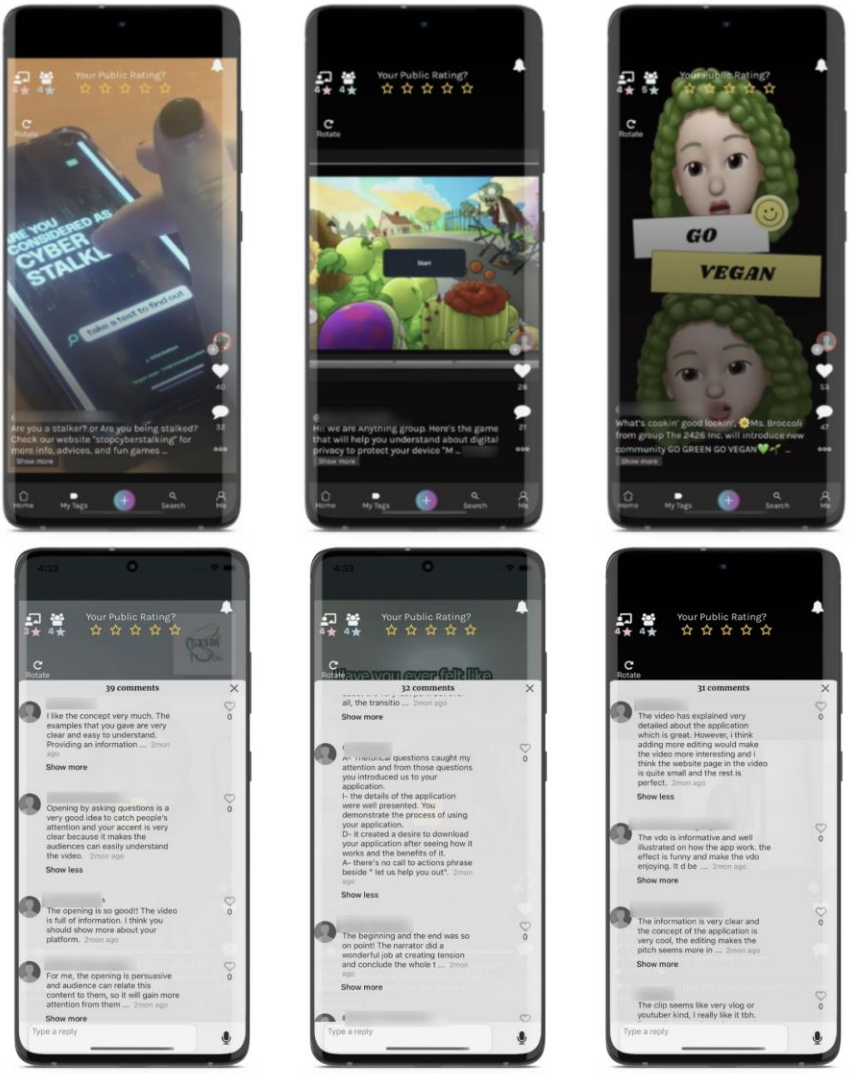

Figure 1: Screenshots of mobile videos and comments from Soqqle app

4.2 Performance

Participants stated that being a part of the group to complete the video-based task allowed them to experience and observe the different skills required to complete the task. However, it was also pointed out that due to the lack of hands-on experiences in each part of the video activity, participants were unable to have a deeper experience on the different tasks which were performed by the other group members. One participant recommended repeating the video-based tasks and rotate assigned roles to allow for more opportunities to get hands-on activity.

I think that doing it as a group would be better, because everyone everyone in the group has, you know, different skills that they're good at, some know editing, some are creative - But right now admittedly, I cannot remember all of that process at the steps of the pitch because I only took part in some of the work processes." Speaker 1, International

But what about making two projects with that video editing (the video pitch)? . . . So if it is a pitch project, then maybe we can do the different arrangements of the team. So for this group, maybe I will take part in video editing or something like that. But in another part of the project, I might get another responsibility (not video editing). Speaker 2, International

Another participant highlighted that the initial expectation was to use popular social media applications like Facebook, Instagram or Youtube. However, after learning about the private and safe environment of Soqqle, the participant concurred that Soqqle was ideal for experimentation and creative expression.

On when you first assigned the team about the Soqqle... I think many of my friends were asking me, what is Soqqle? Of course. And the point that you just stated, that you want to be a safe place for students to post their video on Soqqle, and there are no public kinds of things. So before I heard your statement, I thought we would just go on an online platform like Facebook, Instagram or YouTube, but after I know your reason, I think it's very useful for the students. So my answer is, yeah, I think we should go with Soqqle because there is some difficulty, but it's not that hard to adapt to the Soqqle platform. I think Soqqle is quite a safe place for us to do our experimenting and express our creative ideas. - Speaker 3, Thai

Participants reported that the video-based activity was interesting, memorable and unique. Notably, it was also mentioned that the ability to review content after the assessment concluded was helpful. Participants indicated that usually in their curriculum they just present their work and having peer to peer engagement for assessments was refreshing.

I think the Soqqle video is memorable because, you know, rather than doing presentations where we listen to each other talk. Watching videos was definitely much more interesting and memorable, and, you know, we could always go back to Soqqle and look at our videos over and over again." - Speaker 1, International

It's a bit unique because we don't have other projects like Soqqle in our curriculum. We mostly just present our work, and yeah, as Speaker 2 mentioned, we would forget such projects, but here with Soqqle, we can review it again. - Speaker 2, International

4.3 Collaboration

Participants perceived that the group work allowed them to assign activities and maximize their productivity. It was also noted that some team members did not actively participate which posed a challenge for collaboration and group work.

Some may not be really comfortable doing the research, but some can be really, really comfortable and creative when it comes to making videos and, yeah, Instagram and TikTok, for example. So I think I learned that I should put the right man in the right job because like, if I force everyone to like, OK, he has to do research and then you all have to do the research. I mean, it would be draining for everyone and not really productive for the group. - Speaker 1, Thai

There were some present in the meeting who didn't contribute that much. Sometimes they do not even attend the meeting. So this creates some negativity for me and friends, of course. - Speaker 3, Thai

4.4 Reflection

Some participants reported feelings of competition while completing the video-based assignments as they watched the videos of their peers. As participants watched the content of their peers, they would compare the performance of others against their own. In this context, a form of passive observational learning would take place. Not everyone felt this competitive element and it did seem to depend on the level of individual motivation. Furthermore, the format of videos was described as entertaining rather than competitive by one of the participants.

It's kind of like competitive somehow, because like everyone posts their pitch on the Soqqle and then we see it, and then we compare it to our own group and comparing another group to like the risk, - Speaker 2, Thai

I am not a super competitive person but on the other hand, I feel like it's very entertaining because watching my friends doing stuff like this, it's very interesting. - Speaker 3, Thai

4.5 Feedback

Participants provided responses that indicated they had trouble providing effective peer feedback. It was also noted that besides comments, other alternative forms of feedback could be used.

I feel like commenting is kind of a bit of a struggle, not as much the structure, but I feel like my natural action is to be a bit aggressive in commenting, and I didn't want to comment like that for the activity … But sometimes I just feel like, yeah, there's some certain groups that didn't really perform well on it. But I felt like I couldn't say that, of course, because it seemed like it would be too obnoxiously aggressive. I didn't feel like I could articulate my feedback in a non-aggressive way. -Speaker 1, Thai

Commenting on anything is quite reasonable to me but being forced to comment only on certain content or things (like AIDA). I feel like we could have done that in alternative ways, like anonymous polling and giving points/ratings of each of the group videos or something. - Speaker 2, Thai

Participants provide opinions that they were not comfortable with posting feedback on public and personal social networks like Facebook. This is despite features on the applications that allows content to be private. Soqqle was described as ‘clean’, whereby only students could review and participate in the activity.

Facebook and YouTube would be kind of public data and I mean, I would not really be comfortable posting our videos there. I don't like to put my work and my comments on a live/public social media because I personally am not really active or comfortable in terms of commenting on social media at all. - Speaker 2, Thai

I think if it's a closed environment, then I feel like it's more formal. And yeah, it's more valuable. If we did it on YouTube or Facebook, some people might get confused with our purpose. -Speaker 2, International

I think Soqqle is like a very clean environment, like it's only us, the students. So, if it was posted on YouTube or another platform, then we would receive more comments from other people that see a possibility that would happen, and those people might not be as nice as our classmates. - Speaker 1, International

4.5 Realism

The use of videos was described as useful as the format is popular in modern social media platforms like Tiktok. However, as the activity was group based, not everyone had the chance to create the videos.

I think it was helpful because now a lot of businesses, they start to enter social media platforms like Tiktok and stuff, and the videos we did are similar to something we could put on Tiktok, as it's a short video business, so it will be helpful. But because I was not in the pitch video team, it was just not as memorable, but I bet that this experience for people who have been doing the video, it is definitely beneficial for the future. - Speaker 1, International

Although comments were described by some as not useful for learning outcomes, one participant highlighted how reading and handling feedback was relevant in a real life situation.

For me, I think it's really helpful like... Even if the scope was only in the context of TU106, we got a lot of comments. So in reality, we might get more comments and it's a kind of like a real life situation where we need to accept those comments and feedback. So in reality it would help us to experience that need to accept comments or feedback. -Speaker 1, International

4.5 Varying Experiences

As the video-based activity involved participants completing tasks with one provided framework, participants highlighted the opportunity to have more self-directed learning to search other frameworks. However, there was no conclusive result on whether a deep study into one framework or having opportunities to explore different frameworks was better. This was especially true with regards to the use of the evaluation framework AIDA (Attention-Interest-Desire-Action) as the main framework for creating their pitch videos.

The business pitch can be many things, right? But if we were to discuss more about making these videos, I think maybe use a different framework? I mean, I am not saying to get rid of the AIDA framework, but I mean, like on the framework, it might be better to let students pick their framework, and figure out which one would actually work best for their own project because like, there's a lot of different theories out there. - Speaker 1, Thai

I still have a mixed feeling about this because, sticking to a one framework could allow you to like to add more on the content. Like you could teach more deeply into

the concept. You can teach them how it is, what it is, and this would allow it to stick more, but you could also give them a variety of framework choices. But I think you don't have time to teach them all the stuff right? - Speaker 2, Thai

I think you can give us another five theories (in addition to AIDA) with the same level of detail, then I think it would be OK. Some students, especially in the first year, might be able to comprehend the theories quite well, so a few of them can really process the information about the theory and put it to good use. But I mean, for others it could drain them out quite a bit. - Speaker 1, Thai

4.6 Perceived self-competence affected reflection of content from peers and ability to provide constructive feedback to other groups

The students differed in terms of their perceived self-competence in reflecting on the comments of their peers. Both students agreed that commenting had to be required, otherwise, none of the students would have provided any constructive feedback to their peers. However, both the international and Thai student focus groups expressed their reservations about the effectiveness of the peer commenting part of the video assignment, with the international students feeling a bit more comfortable than the Thai students in commenting on the videos. Some of the most illustrative quotes of this issue can be found below:

I think we should focus on who is commenting because, for example, like I don't have direct knowledge like you. So let's say for example, we are in journalism or communication class. You are a teacher. I am a student. You know, I'm not that good at journalism or communication, I can teach my friends sometimes about some topics, but I cannot be like you. I cannot give direct insights like you. So it's kind of hard for us to come into something and like, give the specific feedback. I'll give something very useful for our friends to improve their work. So I think we do base our attention on the comments a bit to who is commenting. - Speaker 3, Thai

I think in another way, so our product is supposed to solve our customers' pain points, and our customers are not going to be some rocket science mathematics people. So I think it's OK to comment on someone else's video. Otherwise, how are we supposed to know where to improve and how we can suit our customers better if we don't even want to hear these "not expertise" comments? - Speaker 1, International

In terms of how to improve the perceived self-competence of students to reflect and comment constructively on the other pitch videos, opinions were divided as to what were the best solutions. Although the Thai respondents said making commenting anonymous, or teacher interventions in the commenting process, such as teachers "upvoting" or liking good comments to provide a model for commenting, could be effective ways to elicit more reflective and constructive feedback, the international students were not so keen on these ideas.

So I will say that teachers are commenting on student comments and telling us, like what we did good and what we could improve. So it could be the model for the student to like.... I don't really want to use the word copy, but yeah, some maybe do it, but I think it would be the model for a student to like, OK, this is how you should comment on your peers' videos. I think it would be good if they had a model to follow. - Speaker 1, Thai

I think if teachers like, you know, 'like' the comments or 'upvote' them. I mean, and I don't think it would be that helpful, because for me, it's like when we are in elementary school and then the teacher fills in as an example and then everyone follows and does the same thing. So I don't really think that is helpful for me. I think it would lead to a lot of copy/pasting. But what we mentioned about the comments being anonymous, I think, would be helpful in some way, but that's not like the ideal end solution. I think as long as we are classmates, this is a never-ending issue. Maybe if we had someone that is not in our faculty or doesn't know us at all comment, this would be more straight forward instead of just your video looks nice. - Speaker 1, International

I think if we define how to comment or something like that. Like, it may have the effect of nurturing the wrong mindset towards commenting, and they, like the student, might get that mindset like "this comment is right, but this comment is not right" or something like that. So it's a kind of restriction on their thinking. - Speaker 2, International

Another issue that impacted their ability to reflect on the content and provide constructive feedback was the strong feelings of camaraderie they had with their classmates, and this made them even more reluctant to provide constructive feedback. Several of them mentioned they did not want to cause some distress for the other groups.

When we had to comment on the video, it was more difficult because we thought, if it was produced by our own team. It would be very difficult for us to tell our teammates that the video is not as great as we expected it to be, and it would be very annoying for them to have to fix it over and over again. So I think it was for this reason why we, you know, we were not as direct with our comments to the other group videos. - Speaker 1, International

Overall, while the students believed there was definitely value to the peer reflection and peer commenting, there were still several issues that prevented the comments from being constructive and helpful for the improvements of the groups. Most notably, the students mentioned being uncomfortable with their perceived lack of expertise in business pitching, and potentially harming the morale of the other groups by being too constructive in their feedback. However, the international students did mention that allowing the students to do the video pitch twice as opposed to just once, could be a way to encourage students to pay more attention to the comments:

I think it would be helpful [to do this video activity twice] because we would be absorbing the feedback and could actually look at the feedback and make improvements. So I think doing it twice would be better because during TU106, we only did it for once and we kind of just finished the video and we didn't really go back to it. - Speaker 1, International

4.7 Group effects were seen in overall participant's learning experience

Participants collaborated and considered the skillsets of the group. For the most part, all the respondents agreed that they were able to divide the work evenly amongst themselves, and there was effective collaboration displayed by most of their team members. Although there were a few students who did not contribute much, the students said that these students did not

impact the overall experience of working in their groups. These were evidenced by the quotes below:

I would say that our group work was effective, although there were some people who didn't work, we were able to learn some things about effective teamwork and collaboration. - Speaker 1, Thai

I think, if I had to do this assignment individually, I wouldn't have been able to do it because I cannot video edit, so working as a group was beneficial for me. - Speaker 2, International

The group work aspect was a bit of a hassle because we had one member who never showed up or helped us, so it does make me think that if we were to do this assignment in groups, we should do it with a group of people we know well, as opposed to people we don't know. While yes, we do learn how to work as a team and communicate, it was just a struggle sometimes to schedule meetings together with some of our members. - Speaker 3, Thai

5 Discussion

Overall, although both focus groups noted having a positive experience with the social learning activity, they did have differing opinions on the nature of their learning and what they gained from the experience. In terms of the similarities between the two focus groups, both focus groups mentioned there was some challenge to doing the activity, and none of the respondents indicated that the task was not challenging enough.

The findings of this study suggest personal and interpersonal factors that influence the ability for students to practice higher order thinking. It was observed that some students appeared to be more dismissive of peer feedback, while some students felt a sense of worry if their work was able to meet learning goals. It should also be noted that while participants appeared to focus on video editing, it is possible that adjusting the explanations and graded assessments may redirect them to other competencies such as content development.

One objective of this study was to cultivate a sense of entrepreneurship and problem solving through product pitching. The ability to communicate problems was also important in the activities. However, a few points were observed around the learning outcomes. As many of the students reported not having much background in product pitching the students with first year students in the degree program, most many of the focus groups respondents perceived that they did not have the knowledge to effectively participate actively in a peer to peer and collaborative manner to solve problems. Some mentioned about the lack of self-confidence (and efficacy) in providing peer feedback or being perceived as "aggressive" to their classmates. Unfamiliarity was also mentioned as a factor in participation. Although being able to collaborate with others we do not know well is also often a realistic situation in a work environment, the classmates knew each other quite well and seemed to be reluctant to criticize each other's work. Secondly, participants were unlikely to perceive themselves as being experts in the topics selected for their product. This impacted their sense of usefulness when they engaged in peer-to-peer feedback. A potential solution is to include a phase of problem identification and investigation early in the program. Participants can explore problems closest to them and discuss them with peers, thus increasing the perceived usefulness of engaging peer to peer. Nonetheless, although peer feedback was described as shallow in our study, participants highlighted increased motivation due to encouragement

from friends. Also, by incorporating feedback, participants were more likely to watch the videos of others, thus increasing the benefits of getting new ideas from others.

It was observed that some students reflected on content based on whether their teams were able to make improvements on their work, not just with their own work but also when commenting on the work of their peers. However, if a student did not feel confident in making accurate judgements of good and poor quality, the student would similarly not express motivation to learn from others. Thus, it should be also noted that despite students obtaining vicarious experiences (Bandura, 1982), the ability to benefit from them does depend on the students' perception of the skills of the team as well as the students' perception of their own assessment abilities. This suggests that a certain amount of scaffolding is necessary to build students' self-perception of evaluating peer content for social learning. It was clear, particularly for the Thai student respondents, that they were not as comfortable providing comments to individuals they viewed as equals, while the international students indicated that they believed that even comments from "non-experts" such as themselves could be valuable for learning. However, both groups indicated that peer comments were not useful for improvement of their own work.

Some participants also compared the content of peers against the abilities of their own groups. For example, a participant in a group with strong technical skills may not feel the benefits of watching content from others with lower perceived technical skills. As this was a video project, many of the respondents focused more on video editing skills as opposed to the business pitch skills. These signal effects of collective efficacy (Bandura, 2000) where a student's self-efficacy can lead to a group benefit. For example, a student's skill on video editing results in a group member's confidence in the performance of the team. This is supported by Glassman et al. (2021) where collective efficacy is suggested to be a reciprocal causation relationship between possible actions, and feedback, to individual and group cognitive filters. The authors further suggest that collective efficacy can be measured on the participant's influence on social, engagement and co-creation capabilities.

It is important to note that while some groups appeared to display higher collective efficacy in accomplishing tasks, some participants indicated unclear learning goals and objectives. For example, many respondents focused more on developing skills in video-editing, while some students recognized clear communication as a learning objective. It was evident that the program was viewed as a video editing assignment. Thus, students may have overlooked other important self-directed learning objectives like communication and problem solving. This was further affected by a lack of self-efficacy described earlier due to lower appreciation or understanding of the topics. As learning skills like communication require scaffolding and careful execution (Teo, 2019), it is critical for practitioners to plan multiple learning outcomes and challenge levels to keep students motivated. Participants suggested in the focus groups to be given opportunities to search for different tools (e.g. communication frameworks) instead of being directed to use only one.

Overall, we purport that the key themes on perception of self-competency, the group effects and interpersonal interactions are the factors that influence a students' willingness to learn from peers through mobile videos in a social network. (Answer to RQ3) Cultures with high constructivist behavior such as Thai are influenced more by effects contributed by collective efficacy compared to others.

5.2 Theoretical Implications

The findings of this study help to extend understanding of the use of social learning for collective efficacy in education for sustainability. As studies that use social media for education for sustainability are sparse, this study can provide insights to educators looking for

new ways to encourage peer to peer engagement and collaboration. Through this study, factors that influence students' perception of peer content on social media can be considered for future research.

5.3 Limitations

For the focus group results, there were a few key limitations. Firstly, because none of the students were native speakers of English in the international student group, it is possible that some of them were not as comfortable discussing their views openly due to a lack of proficiency in English. The focus groups were also conducted in October 2021, a few months after the video activity had concluded, making it difficult for some of them to remember what exactly happened. However, because the focus groups were more geared towards assessing what the students remembered as opposed to having them describe what they did or how they felt, this study was still somewhat useful for understanding how deep the learning from the video activity was for the respondents. As the study utilized only focus groups, the results cannot be generalizable to a population. On a related note, as the focus groups featured a non-randomly selected group of students, so the respondents do not represent all of the possible viewpoints of the students who participated in social learning activity. It is also possible that a lack of explanation of social learning led students to overlook key aspects of the activity (e.g. the comments from their peers) and focus exclusively on more traditional feedback structures (e.g. teacher-student). Despite these limitations, the study has provided a few interesting findings into social learning in an Asian context. Future studies can explore how the group dynamics, the setup of learning assessments, and expected learning objectives might affect the benefits of peer-to-peer learning.

5.4 Recommendations

The study could benefit from incorporating a few improvements to its educational design. Firstly, to improve the individual proficiency and guidance, the technological system could benefit from automated metacognitive instructions. A study by Zheng et al. (2019) using automated group metacognitive instructions to deliver hints, prompts, and questions. Based on the factors identified in this study, it is possible to incorporate such features into the system to encourage a more personalized learning that can build self-efficacy.

In summary, according to the authentic assessment framework (Appendix A), the students found the Soqqle video activity to be challenging not just in terms of video editing, but also in terms of teamwork and collaboration. The students were also able to create a unique product geared towards addressing a sustainability problem as part of the product pitching. While there were some issues with collaboration of many teams as expressed by the focus group respondents, collaboration for the most part worked well for all the teams. The respondents also felt that the Soqqle activity was sufficiently realistic and indicated that receiving comments from their peers helped the whole activity feel more realistic in a sense. The students were also able to have diverse experiences with the pitch video creation process, though some indicated that their experiences could have been made more diverse by being allowed to do the video pitch twice and switching roles/responsibilities. The students all indicated they felt like they gained useful knowledge from the activity, and it was a good "warm-up" to understanding what a product pitch was and more importantly, how it should be done.

One clear area for improvement on this activity was the opportunities for reflection. While the peer commenting part of the assignment was supposed to elicit reflection and discussion among the students about the quality of the product pitch videos, it seemed to only

generate positive comments that reinforced their work quality was adequate, but did not necessarily make the students reflect more on how to improve their own work. The observations of the focus group respondents indicate that this was not necessarily a problem with the activity itself, but more an issue of students not having enough practice with reflecting and giving constructive feedback. It appears that doing the video activity just once would not generate sufficient reflection, and the activity has to be done multiple times for students to see the opportunity to discuss and reflect on their work in a more substantive manner.

6 Conclusion

In conclusion, although this study is limited in scope and qualitative in nature, the results yielded several interesting findings that warrant further investigation, as well as recommendations on how to implement social-learning activities in a multicultural learning environment. It should be noted that while the class was briefed on the social learning assignment, the students were not fully briefed on the concepts of social learning or authentic assessments, so it is possible that the students overlooked certain aspects such as social learning as part of the learning experience. Educators who hope to implement social learning activities should focus on not simply briefing students on new learning activities and tools, but also discuss the type of learning that should result from these activities.

The research also highlighted possible cultural differences between Thai students and other Asian students in terms of their perceptions of social learning. Although both sets of students were receptive to authentic assessments and viewed the activity as practical and applicable to real-life contexts, there were very different views on the social learning aspect. The Thai students were especially critical of the lack of guidance provided by the instructors, and how they were still not quite clear on how to persuasively pitch a product. Future studies might benefit from doing pre/post-tests with students to ascertain what they already know about a topic such as product pitching, and more reflection assignments to help students identify not just what they learned, but also what they still do not understand.

Reflection is another area that warrants further study. Although this was not specifically discussed in the focus groups, previous research has emphasized the importance of reflection with experiential learning activities. Although some students mentioned reflecting on comments from their peers as a key part of their learning within the activity, many others focused more on the activities, and suggested that having more activities would have made the learning much more effective. Future research should scrutinize the understanding of reflection within experiential learning, especially within Asian countries, as reflection is not always a part of the process that is explicitly mentioned.

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Appendices

A. Authentic assessment categories and description

Authentic Assessment Category	Description
Level of challenge	Experienced challenge that is of an appropriate level. Level of challenges may result in motivation or demotivation. Challenges may vary as the task progresses.
Creation of performance	The opportunity for a student to create a product. This can signal a sense of achievement for the student and encourage the student to participate more and put in more effort.
Experience of Collaboration	Opportunity to collaborate with others. Collaborative learning has been shown develop higher-level thinking, confidence and self-esteem as well.
Sense of realism	Task conducted can be applicable to a real life scenario. Can also represent completing the task in a situation or environment close to a real life scenario.
Observation of varying experiences	Exposure to diverse experiences that can increase learning outcomes based on different scenarios, situations. Able to handle various aspects in a complex scenario
Obtained knowledge that can be transferred	Opportunity to transfer knowledge from one context to another. Often requires scaffolding and reflection.
Opportunities for reflection	Ability to improve understanding of issues, develop insights, and identify issues. Requires a sense of metacognition ability to improve understanding.