"Face-to-Face" or Sim-to-Sim: Pros and cons Regarding Group Work Using a Games-Based Environment

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Abstract: It is argued that face-to-face (F2F) allows students to get to know each other and collaborate, including quite a bit of informal communication in F2F meetings. However, during the pandemic, even the F2F has been digital. There is an uncertainty of how future higher education will develop, with the extension of the digital/virtual appearance being in the future in terms of hybrid solutions. In turn, this will put some constraints on the forming of groups and group work in classes. Some investigations, for example, why students appear with black screens, point in a direction of introducing Sims - virtual characters or avatars - as it is about feeling comfortable in what the students experience as an exposed situation. In particular, the students who entered higher education in the fall during the pandemic (Fall 2020) seem to have a high threshold regarding showing their face on the screen during seminars. The students "disappear" prior to group work sessions, only to "reappear" after the group work. What can we learn from the students when developing a games-based environment to support socializing, and thus facilitate for students to collaborate and cooperate in order to solve tasks during group work? Where do their preferences lie: working digitally "face-to-face" (F2F) or by using avatars, and why? Our data is based on investigations among approximately 450 students at the Inland Norway University of Applied Sciences, where we have interpreted results from a quantitative survey. In this paper, we will argue for both views. And even if the survey showed that the students were not unanimously in favour of avatars, we will conclude with suggestions for a new research project and provide guidelines for a dual approach, as well as investigating which settings provide the most comfortableness and best experienced learning outcome.

Keywords: gamification, digital escape room, enhanced learning outcome, online learning, avatars

1. Introduction

Due to the Covid-19 pandemic, a vast number of universities and university colleges have executed most of the educational activities online by utilizing a diverse range of tools, such as Teams and Zoom. Although e-learning has been utilized for decades, there is still a substantial number of faculty staff who have lectured "live", and learned new tools and new ways of teaching (Nadler, 2020).

However, new and unexpected potential problems have revealed themselves. Quite a few lecturers experience "black screens", in which students choose not to turn on their cameras, and only appear with more or less "interesting" names and aliases (Lervik and Madsbu, 2021).

In our experience, the online medium then becomes a "one-too-many" tool for communication, which takes us a step back from student-involvement and -engagement (Vold and Ranglund, 2019).

An annual major survey among Norwegian students (Student Welfare Organization of Southeast Norway, 2021) unveils disturbing conditions among students during the corona pandemic, with many students feeling isolated and suffering from mental health issues. The students' representatives have repeatedly suggested more group work. However, as lecturers in several (online) courses, we experience that when we utilize group work, features such as "Breakout Rooms" in, e.g., Zoom, we see the number of participants rapidly decrease, only to increase again after the group work session is over.

We could only assume what the reasons are for this evasiveness; some assumptions have been: not wanting to be exposed to others because they do not know their fellow students, not feeling that they want to show their surroundings (children, pets, mess, etc.), and that they are afraid to engage in discussions, as they are not sure of their own knowledge base and do not want to be "exposed".

Hence, we needed to find out what the students themselves report are the reasons for "black screens" and a lack of participation.

Our research questions are therefore:

What are the reasons for "black screens"?

What are the reasons for not participating in group work?

As lecturers also researching games and learning, serious gaming and games and simulations for learning purposes, we wanted to investigate whether the students would participate more if they could be represented by a "digital figure" - an avatar. Mørch, Caruso, Hartley and Ludlow (2018) define avatars as "visual representations of a user by an animated 3D-figure controlled by the user through customization and movement". This would then allow the students to be more anonymous and feel less exposed.

Our third research question is therefore:

How would the students perceive being represented by an avatar when working in groups?

To seek answers to our research questions, we have conducted a survey among students in a bachelor degree study programme. In the following, we will present the theory that has informed our study, followed by the results from the quantitative investigations. We then discuss the results of the inquiry, and based on this we will propose a research project before we conclude.

2. Theoretical foundation

Student-active methods, such as the "Flipped Classroom" (Vold, 2014), have been used for many years in different versions. The primary intent with these pedagogical takes is to involve and include students and (hopefully) foster engagement and enhance the learning outcome. Combining a "Flipped Classroom" with gaming in the classroom has been tested (Venemyr *et al.*, 2017; Vold *et al.*, 2017, 2018). Here, the "flipping" was about having the students not only experience gaming, but also about developing the scenario for the gaming session with a successful outcome.

Another game that has been used at the Inland Norway University of Applied Sciences is the quiz game Kahoot! (Haave and Vold, 2018). Through the use of this game, the students were involved by having them provide the questions (and answers) for the quizzes. In every year we conducted this study, the students reported on enhanced learning outcomes, and have also expressed enthusiasm regarding this way of learning.

However, it is important keep the students in a flow (Nakamura and Csikszentmihalyi, 2014). Even so, this may prove difficult if the transactional distance is perceived as too high (Moore 1993). As a result, it is important to design the environment so that the capacity for individualization is present, and one is in a high degree of dialogue with students during the process.

At the same time, we need to require some effort from the students. A variation in the education will contribute towards an enhanced learning outcome (Ministry of Education and Research, 2017). A study at the Inland Norway University of Applied Sciences (Lervik and Madsbu, 2021) found that students who had "black screens" learned less than the ones who had their cameras on.

One possible explanation for this may be that the threshold for engaging and involving in the lectures is perceived to be higher in online education (Moore, 1993). Adult learners need to be involved and engaged to experience ownership to a task, which again enhances learning outcomes (Knowles, Holton III and Swanson, 2015). It is important to facilitate for the students to expand their "zone of proximal development" (Vygotskij, 2012). Vygotskij focuses on the value of cooperation, affinity and community tied to learning activities (2012), which is what we want to achieve. This requires communication, which again needs a sense of reasoning. The participants need to follow some ground rules for communication, including understanding, equality, openness, inclusion and validity (Habermas, 1984). By setting up these rules, and providing them with the opportunity to create an avatar and gamify the environment and task, may then provide the opportunities for an enhanced learning outcome.

Within experiential learning, gamification is a technique used to enhance the user experience, and for the learner to immerse him/herself with a gamified system perceived as stimulating and engaging (Goethe, 2019). Using avatars may bring the element of gamification into the learning system.

Pasfield-Neofitou, Huang and Grant (2015) describe how students experience how the boundary between themselves and the avatar ceases to exist, and argue how this "virtual embodied cognition" enables immersion and learning. Virtual simulations may also enhance the sense of presence (Dieker *et al.*, 2014), whereas the 3D virtual environments might create and enhance a sense of community to a larger extent than in a F2F course (Steinkuehler and Williams, 2006). Here, students may interact through their "online persona" (Vasileiou and Paraskeva, 2010). Due to a sense of anonymity, students may feel safer. This may also lead to an establishment of a learning-friendly environment (Atkinson, Mayer and Merrill, 2005). Furthermore, the virtual world can be seen as "a natural extension of the real world" (Koehne, 2011). For students, engaging in learning activities through an avatar may be less frightening, and thus reduce the fear of committing errors compared with face-to-face interactions (Grant, Wallace and Spurgeon, 2013).

3D virtual worlds, such as Open Simulator, allow the user to create digital artefacts and customize their environment and own avatar (Koehne, 2011; Mørch, Caruso and Hartley, 2017). This means that you can choose your "digital representative" to look similar to that in real life, or totally different. The methods of communication in Open Simulator are primarily speech or text, but another way of reacting and responding to others is by using the "gestures" features.

Since body language is neither visible nor obvious, this type of interaction may feel less nuanced (Mørch *et al.*, 2018). Nevertheless, the use of virtual world technology in education requires educational guidelines (Wang, 2011). In addition, this virtual environment also requires assignments to "scaffold" student learning, and to overcome technical challenges (Mørch *et al.*, 2014). Zheng et al. (2009) confirm that instructions need to be well-designed, and state that a virtual world may be well-suited as an environment for problem-based learning. Synchronous activities and interaction in a distant education course should be scheduled in advance to help simultaneously facilitate lectures and educational tasks (Vasileiou and Paraskeva, 2010; Mørch, Caruso and Hartley, 2017). On the other hand, individual activities or spontaneous collaboration could be performed at any time in a virtual world.

One way of gamifying the digital environment of online learning is to develop Digital Escape Rooms. There have been several initiatives with relatively positive outcomes (Clarke *et al.*, 2017; Vidergor, 2021). Escape Rooms have been defined as "live-action team-based games, where players discover clues, solve puzzles, and accomplish tasks in one or more rooms in order to accomplish a specific goal (usually escaping from the room) in a limited amount of time" (Nicholson, 2015). Generally used for recreation and fun activity, lectures and teachers have become interested in this type of gaming, as it supports the development of skills such as leadership, working in teams, communication and thinking creatively (López-Pernas *et al.*, 2019). According to López-Pernas et al. (2019), escape rooms developed by lecturers and teachers can be defined as: "escape rooms that include part of the course materials within their puzzles in such a way that students are required to master these materials in order to solve the puzzles and succeed in the escape room".

3. Method of inquiry

Since this is an introductory study, we chose a quantitative approach by using a survey (Cohen, Manion and Morrison, 2002; Creswell and Creswell, 2017). The design of the study has a cross-sectional approach that allows us to measure the respondents' experiences and attitudes at one time point (Harwell, 2011). We wanted to investigate how a group of students experienced digital lectures and the use of Breakout Rooms when taking part in Zoom lectures. The lectures have been held by different teachers, but they all make use of Breakout Rooms for assignments and other student activities. The data was collected through the use of a questionnaire prepared and distributed through "Nettskjema" (see: https://www.uio.no/english/services/it/adm-services/nettskjema/), with the results generated through the same channel. The study's target group included a total of 450 students following four courses in organizational theory. The questionnaire consists of five questions, in which we asked the students to take a stand on different statements. The score values were 1= do not agree at all – up to 5= strongly agree. The use of more open-ended questions would have been a good supplement, as it may have provided us with richer material (Lincoln and Guba, 1985). The questionnaire was distributed by e-mail to the students from the different Canvas Rooms. We received 94 answers, which yielded

a response rate of 20%. Based on the output from the survey system, we have presented the findings using a percentage. The results are not to be generalized, but are of transition value to similar cases and conditions in developing work.

4. Results and discussion

In the following, we present the results from our survey, in which we asked the students questions regarding their experiences with digital lectures. The results are presented in the text below as percentage values, in which the value "do not agree" refers to columns 1 and 2, while "agree" refers to columns 4 and 5.

4.1 How was the student's experience from participating in online lectures?

According to our material, the majority of the students were positive to digital lectures, and did not find them too long or tiring. Over 80% of the respondents agreed or strongly agreed with the notion that digital Zoom lectures are *a good replacement* when a physical lecture is impossible. A majority of the respondents (57%) found that the 45-minute lectures were not too long, and that 52% did not find it tiring to follow digital lectures. A total of 52% seemed to be positive to be able to see the lecturer and other students. Approximately 42% of our respondents agreed or strongly agreed that the balance between lecture, assignments and breaks has been good, while 36% were neutral.

Table 1: How did you experience taking part in Zoom lectures? Percentage (1=Don't agree- 5=Strongly agree); N-94

Answers	1	2	3	4	5
It was a good replacement when physical lectures were not possible	3	4	10	**22**	**61**
A 45-minute Zoom lecture is a long time	**25**	**32**	23	14	6
It is tiring to follow ZOOM lectures	**20**	**32**	20	14	14
The quality of the line is important; a bad line gives an incoherent lecture	15	9	18	**20**	**38**
It has been positive to see the lecturer and other students	10	6	32	**16**	**36**
The balance between lectures, assignments and breaks has been good	5	17	36	27	15

4.2 Students' responses to "black screens" during digital lecturing

Many studies performed during the corona crisis report that students preferred a dark screen when they were following lectures online (Lervik and Madsbu, 2021). The reasons for this are varied, and we were interested in the students' views on this issue. A total of 63% of the respondents seemed to agree or strongly agree that *it is tiresome to be looked at all the time*. It is a different experience to sit in the lecture room side by side, compared to watching others and be watched for a long time online. A disturbance from family/animals was given as a reason for turning off the video by 45%. Approximately 32% pointed to not being well-enough prepared for the lecture as a reason for having a dark screen. To a majority of the respondent, reasons such as having a "bad hair day" or a "messy room" *were not the reason* for turning off the camera, as only 22%/18%, respectively, agreed on this. Only 11% experienced screenshotting, with very few having reported comments on their looks as the reason for turning off the video.

Table 2: Reasons for not having the camera on during digital lectures; Percentage; (1=Don't agree- 5=Strongly agree); N-94

Answer	1	2	3	4	5
I'm having a bad hair day	**42**	**22**	14	14	8
My room is messy	**44**	**22**	16	11	7
My family or animals can disturb me	27	10	18	**23**	**22**
I have experienced screenshotting when I have had a camera on	**77**	**8**	4	7	4
I have gotten comments regarding my looks with a camera on	**80**	**11**	7	0	2
The lectures start too early for me to be dressed	59	6	12	8	15
I find it tiresome when others can see me all the time	9	10	18	**26**	**37**
I was not well-enough prepared for the lecture	**28**	**14**	26	21	11

4.3 Breakout Rooms - hot or not?

During the lectures, Breakout Rooms were used for group assignments. Our material shows that nearly 1 out of 3 respondents (30%) claim to have actively taken part in Breakout Rooms, while 28% were occasionally active in Breakout Rooms. Moreover, nearly 1 of 4 (24%) reported *that they have never taken part* in Breakout Rooms activities. One out of 3 (33%) claim to have a learning outcome from group work. Regarding group organizing,

39% preferred working with the same group, whereas 23% also had a learning outcome even if the groups differed.

When asked why they did not take part in Breakout Rooms, the reasons given were very different. A total of 43% could not take part in discussions due to a lack of preparation, 43% had to do other tasks (phone calls, etc.), while 42% gave the reason that they did not know anyone in the class, and found it tiresome to get to know people in this way.

4.4 Use of avatar – instead of live video in groups?

We wanted to know whether the students would be interested in being represented by an avatar instead of showing their face in a live video *when working in groups*. **Positive**: The material shows that approximately 25% of the respondents answered yes to the use of avatars. **Do not know - but positive**: A total of 31% of the students answered that they did not know, but were positive toward the use of avatars. **Negative:** Approximately 44% of the respondents were negative toward using avatars. This response may be due to an uncertainty among the respondents regarding the term "avatar".

Even if the students in the study seemed less enthusiastic about using avatars, the literature claims the opposite, as the use of avatars will support the anonymity (Atkinson, Mayer and Merrill, 2005) that the students seem to seek to obtain through the use of their "black screens". Their responses on "finding it tiresome to be observed all the time" (reason for "black screen", see Table 2) addresses an issue that could be resolved by the use of avatars.

Utilizing avatars may reduce the fear of erroneous behaviour (Grant, Wallace and Spurgeon, 2013). However, this result may be due to a lack of experience with using avatars, and thus being unable to envision the usage of avatars in their group work. Hence, this requires further and more extensive investigations.

5. Conclusion

According to our study, most students found digital lectures to be a good replacement when physical lectures are not possible. Regarding the use of Breakout Rooms, it seems that a majority of the students found it more difficult to relate to group work online. A digital environment may not be perceived as the best of learning environments, and one will have to work with the conditions to enhance the students' learning outcomes. It is therefore important to secure good and ample communication, as well as a structure that allows some individualization to help avoid a major transactional distance (Moore, 1993).

Using avatars has some clear advantages, as it allows for being less exposed, and provides an anonymity that may scaffold the students' participation in group work. It may also reduce the disadvantages of "black screens". The responses, which we interpreted as not being negative, but instead as a more apprehensive, show that there is a need for investigating this issue further.

5.1 Further research

Based on the results from the survey, we would like to do a follow-up, in which we create a pilot study with a group of students trying out the use of avatars in representing them in digital fora as a gamified way to work with the curriculum. We are in the process of developing a digital escape room where they may join a group, in which they use avatars, or a group where they are required to join with video. Subsequent to this experiment, we will use a short survey, and follow up with in-depth interviews, with semi-structured interview guides.

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