Collaborative Learning in a Shared Digital Studio

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Abstract (150-200 words)

CollaboratED is a research initiative exploring the opportunities and challenges for collaborative work between online and on-campus students within the Digital Media Design MSc programme at the University of Edinburgh, where group projects are an important aspect of the learning process. CollaboratED asks students and academic staff about the benefits and challenges to group work, looking to find ways to successfully bring on-campus and online learners into a creative and shared studio environment. This paper discusses the outcomes from the longitudinal research, involving questionnaires, observations, and individual interviews with students and lecturers on the programme. The research findings suggest that the challenges that online students face are mostly focused on balancing work and studies, but also relate to working from different time zones and overcoming cultural differences within the team. Despite these challenges, the students recognise the benefits of group discussion and sharing resources with their peers, mostly, however, they value the sense of being part of a community. Despite positive responses towards group discussion and collaboration, in both on-campus and online cohorts, the largest percentage of students prefer to work alone where course assignments are concerned.

Keywords: collaborative learning, online learning, shared design studio, cross-cohort teaching and learning

Introduction

The MSc programme in Design and Digital Media (DDM) was launched in the then Department of Architecture at the University of Edinburgh in 1999 and has since steadily grown to a cohort of around 80 students. The programme offers a broad coverage of digital design techniques and technologies; the students are not necessarily specialists in these areas but may, for example, aspire to become leaders of creative teams where they will need a nuanced understanding of different design disciplines and how these can effectively work together. The programme is taught using a design studio approach derived from traditional teaching, with a focus on practical design projects and group work. In the last five years, the programme has been complemented by the introduction of an online counterpart, Digital Media Design (DMD). DMD features online variations of all the DDM courses, achieved by capture and reuse of all lecture, seminar and tutorial sessions, asynchronous discussion, and where possible use of collaborative tools such as Skype and Blackboard Collaborate in order to facilitate synchronous discussion. These courses share virtual learning materials and most other resources and facilities. Through this approach, on-campus teaching is also online teaching.

Group work is an essential element for the MSc programme in both on-campus and online cohorts. Core courses such as Dynamic Web Design depend on group work of two or more members in order to respond to the complexities of course requirements and whilst working in groups, students are also expected to create an independently identifiable component of the project. The work is assessed on the basis of the group result; however, the students are expected to present the outcomes in a way that makes it possible to identify individual contributions to the joint outcome.

Similarly, as part of the Digital Media Studio Project course, students work as a large group of five to eight members, bringing together their creative skills in the context of an exploratory project brief. Through this the students have the opportunity to expand their practical experience of design technologies and the creative arts. A key aspect of the course is the expectation that the students have to work in complex collaborative situations similar to those in professional circumstances. The successful outcome of the group collaboration is graded, but also calibrated against individual performance evaluated by the peer members.

Although the MSc programme in Design and Digital Media has been running for eighteen years, no substantial research has been conducted with the purpose of evaluating the effectiveness of the shared learning experience in the context of creative studio culture within the programme. The need of such crucial investigation arose even further when the online cohort grew substantially reaching over 50 online learners in its fifth year. Thus, the

research team of CollaboratED is looking to determine the effectiveness of such shared learning approaches and reveal the factors which are most crucial in terms of student experience and learning outcomes.

The aims of the project are to investigate the attitudes towards collaborative work between on-campus and online students and between different online students on this shared master's programme. The initiative is looking to chart these attitudes against one of the aims of the programme: to encourage collaboration between both on-campus and online cohorts. The key goal of CollaboratED is to develop and test approaches to overcome any barriers to collaboration, in particular those of the cross-cohort. Finally, the goal is to integrate successful collaborative mechanisms within the programme and share best practices institution-wide.

Background

Collaborative learning is recognized as a successful approach in higher education with the term 'collaborative learning' referring to a method of teaching in which students work together in a group of two or more in order to achieve a common goal (Gokhale, 1995; Johnson, Johnson, & Stanne, 2000). Collaborative learning may also describe a situation where particular interactions amongst students are expected to occur, which in turn would trigger learning mechanisms. Furthermore, peers do not learn because they are in a group, but because they perform activities based on their interaction. Such activities may be explanation, discussion, disagreement or mutual regulation. Dillenbourg (1999) argues that the field of collaborative learning is precisely about these activities and mechanisms and they may occur more frequently in collaborative learning than in individual condition. Thus, collaborative learning could be seen as a situation in which particular forms of interaction among people are expected to occur, which would trigger learning mechanisms. Sharing the learning process provides students with opportunities to engage in discussion, but also to take responsibility for their own learning and become critical thinkers (Totten, Sills, Digby, & Russ, 1991).

Since the start of the online learning variation of the programme, requirements for group work amongst the online students have become more complex. There are a number of factors for this, such as different locations and time zones, technological barriers and communication and cultural issues (Goold, Craig, & Coldwell, 2008). In addition, trust is viewed as an essential factor when working in a group, particularly for online students. This is partially because with face-to-face, collaborating team members can also interact socially with more ease (Alexander, 2002). A probing argument has been made by Staggers, Garcia

and Nagelhout, (2008) stating that "most successful teamwork occurs after team building, but too often this team building is lacking in online environments" (p.474).

It has been argued that successful distance education students preferred an independent learning environment, and successful on-campus students preferred working with others (Gee, 1990). Self-direction and independence are important when studying at a distance where students have the option to shape their learning environment themselves. In contrast, students in equivalent on-campus cohort, are significantly more dependent learners than the distance group. The online students displaying collaborative qualities are reliant on their need for structure and their willingness to participate as good class citizens (Diaz, Ryan, Cartnal 1999). Therefore, although online students prefer to study independently, they are willing to participate in collaborative work if the structure of the work has been initiated by the teacher. Furthermore, the on-campus students are more eager to work in class providing they can obtain rewards for working with others and for meeting teacher expectations. In contrast, the online learners are more driven by intrinsic motives and less motivated by the reward structure of the class. This represents a challenge for the tutors and course organisers of the cross-cohort master's Programme in Digital Media Design, which CollaboratED is seeking to resolve.

Methodology

In order to capture social process and obtain a more detailed picture (Neale, 2018) we used Qualitative Longitudinal Research (QLR) methods to identify factors influencing collaborative group work among on-campus students as well as between on-campus and online students allowing us to "[…] move away from snapshot pictures of the social world to construct a moving picture that captures social processes" (Berthoud, 2000, p. 15).

Qualitative Longitudinal Research is conducted through time and "[...] time is the driving force for research design and practice" (Neale, 2018, p.2). In QLR design two 'planes of time' are differentiated: while in the first plane we can look at time prospectively and retrospectively i.e. looking to the future or backwards to the past, in the second plane it is related to tempos and time frames (Neale, 2018). While tempo indicates the number of observations, time frame is concerned with the overall time dedicated to conduct the study, and together they constitute the longitudinal time frame which can be conducted intensively, that is through more frequent and continuous visits to the field, and extensively, i.e. with less frequent and less regular visits. In this study we attempted to explore time retrospectively and prospectively through intensive waves. Unlike large scale QL studies, the longitudinal time frame for this study was relatively more intensive as the study was small scale and

each method was used to inform the next. (Smith, 2003).

Research design

The data collection lasted for a year and a half which included three term times at the university. The research design involved mixed-methods and had two steps. In the first step we conducted short questionnaires through university's online portal for on-campus and online students. In the next step we used qualitative methods such as observations and interviews. We employed purposeful sampling method to identify cases in order to gain insights into group work among students on-campus or in an online setting (Ritchie & Lewis, 2003; Creswell, 2012). In total, we conducted four observations with online and on-campus students where we attended their weekly meetings and observed their work progress together. Following the observations, we conducted nine face-to-face and online interviews with students. The interviews were semi-structured with mainly open questions eliciting information about students' experiences in collaborative learning environment. Furthermore, we interviewed three university tutors whose classes included group work. In addition to these interviews, we conducted individual semi-structured interviews with the directors of on-campus and online programmes.

Questionnaires

We compiled short questionnaires for students for our first round of data gathering. The questionnaires included various types of questions to gather demographic data of students. Additionally, it included several open-ended questions to elicit participants' ideas about group work. In the first year of the data collection we launched these questionnaires after students had finished their group work that allowed us to solicit opinions based on their recent experiences. Although student questionnaires were aimed and launched specifically at their cohort (online or on-campus), there were similar and different questions as well. In the second round, we adjusted the questions and launched the questionnaire before the students started working in groups. This was a deliberate step as we wanted to explore students' attitudes towards group work before and after them having experienced working in groups as part of their university experience. In the third round we launched the questionnaires at the end of the group work element.

Observations

Initially, we identified group projects that were comprised of online and on-campus students within the Digital Design Media programme. In the first year there was only one group project that was undertaken in a cross-cohort setting - by one online student and six on-

campus students. The online student joined the group work in the first several instances through Skype call, but in the final stages of the project the online student managed to travel to Edinburgh and attend the meetings on campus. This offered us a chance to document the differences and similarities between the two types of meetings that this cross-cohort group had: online and on campus. Upon receiving consents of the students and tutors, we attended weekly group meetings in the university and observed them without interrupting in any way.

We took pictures of the students in the group work meetings. Furthermore, in line with Creswell (2012) besides the interviews, we developed descriptive and reflective fieldnotes after each observation. The descriptive fieldnotes recorded what happened during the observations, while the reflective fieldnotes were an interpretation of the observed events. (*Ibid.*) More specifically, our fieldnotes reflected interactions amongst the students themselves, with their tutor and the researcher's personal thoughts.

Interviews with students

For the interviews, we recruited a diverse number of students from the on-campus and online cohorts in order to perform a more detailed analysis (Macmillan, et al., 2011). During the observations, we identified 11 students and invited them to take part in an interview. The interviews were semi-structured in nature, with open questions, related to group work activities and lasted between 30 and 40 minutes. The interviews were also audio recorded.

Online Interviews

In addition to face-to-face interviews with students in the university, we also conducted interviews with online students who were located in different parts of the world. Out of nine interviews, three were conducted through *Collaborate*, a university-wide virtual classroom tool which has the capability to allow multiple users to interact simultaneously and has built-in recording options for both video and audio. This system is also university supported and encouraged in order to meet the current General Data Protection Regulations for recorded research material.

Interviews with tutors and course organisers

In addition to the interviews with the students, we also conducted five individual interviews with tutors and course organisers who work with both on-campus and online students from the programme. Such interviews were an important part of the research process, as through them we were able to find out more about the challenges of cross-cohort student collaboration through the perspective of those who teach the students. As with the student interviews, these interviews were also audio recorded and lasted around 30 to 40 minutes.

Data Analysis

The data analysis was situated within the interpretivist paradigm (Mac Naughton, Rolfe and Siraj-Blatchford, 2010). We employed thematic analysis in the data analysis process in order to identify topics and themes that would lead us to potential resolutions to our research questions. The analysis process was concurrent with the data collection, where each method informed the following method (Creswell, 2012). The analysis process involved two stages: data familiarization and in-depth analysis stage that were adapted from the framework analysis approach (Neale, 2017).

Data familiarization

In this stage we listened to the audio recordings, read the fieldnotes, and grouped the pictures according to the group projects. Whilst going through this process, based on the initial research questions and emerging themes during the fieldwork, we developed notes and frameworks, where possible. This kind of general reading of the raw data initially helped us to make sense of the data as a whole.

In-depth analysis

In the second stage we conducted rigorous coding and categorisation of the data. 'The process of coding is one of reducing a text or image database to descriptions and themes of people, places, or events (Creswell, 2012, p. 261). We used Computer Assisted Qualitative Data Analysis Software (CAQDAS) in order to code the data both systematically and effectively (Silverman and Marvasti, 2008). Initially developed codes were descriptive in nature for example, 'lack of time to communicate', 'communication problems', 'social media use' and so on. However, as we continued coding in the following stages, descriptive codes were turned into more thematic codes and we sorted them into sub-groups in order to create an initial framework to analyse the data in further detail. Furthermore, we compared and contrasted the codes during this process. As a result of this process, thematic codes and code-groups were developed, with the intention of identifying initial themes to use for categorisation purposes.

Then, moving on to more in-depth thematic analysis codes and code-groups were refined further allowing the regrouping, refining and eventually re-categorizing of data. Emergent themes were based on the research aims and objectives, that was focused on finding

advantages and disadvantages of collaborative learning in a shared studio environment. As a result of the more detailed and conceptual coding process, final themes were then identified and developed across all cases allowing for the identification of commonalities and differences to be highlighted. Final themes were instrumental in identifying the advantages and disadvantages of collaborative learning as they address various aspects of collaborative learning. For example, 'assuming responsibilities' , 'sharing knowledge' and 'timing' were helpful in developing the analysis results.

The initial results of the data analysis process are reflected in the following section where we introduce our results discussing them within wider literature relevant to this research study.

Results and discussion

The first round of questionnaires and interviews identified two key areas for future evaluation – assessment and grading; and social learning opportunities. The latter factor seems to be particularly relevant for this research, as collaborative and social learning mechanisms are crucial for the groups project courses of this MSc Programme. The theory of social learning (Bandura, 1977) proposes that behaviour and complex learning can be explained in view of a continuous reciprocal interaction, by observing other people's behaviour and their environments. Thus, leaning as a cognitive process, takes place in a social environment and occurs on a vicarious basis. Social interaction between learners and role models is therefore required for social learning to occur. This system of learning is extended further through the proposed model of vicarious learning, where learning can occur not only through participation in dialogue, but also through observing others participating in it. Evidence of such learning can be seen in situations when silent students in a tutorial group learn from discussions between the tutor and others or when readers on an online discussion forum benefit from reading contributions of others (Stenning, Mckendree, Lee, Cox 1999).

Assessment and grading

The most prominent information to come from this study has been around students' perceptions of grading assignments undertaken as group work. Initial evaluation has shown that more than 80% of the students prefer to work on assignments individually rather than as a group. However, when delving deeper into the data, it was apparent that the focus of this perception was on grades and the feeling that grades given to groups may not reflect the individual effort of the student, or indeed lack of effort by class colleagues. This came through as the primary concern for students and tutors when discussing assignments and

working with others for the purpose of assignment: "… the problem is not just with group work, but also group marks," (On-campus student 2).

The data did highlight desires by the students that grading for group assignment should be given on an individual basis rather than as a group. This has provided us with further investigation opportunities to delve deeper into the hesitation students feel around group work in a graded scenario. Similar views were shared by some of the tutors on the programme: "The biggest thing... you cannot give group marks. Do not give group marks. Give marks to individuals and peer group assessment helps to do that. … They asses themselves and that gives them their individual mark," (Lecturer 1).

Social Learning Opportunities

It must be noted that the hesitation shown by students was not about the actual opportunities afforded by collaboration or indeed the act of group work itself. A high proportion, over 75%, responded that they see the value in collaboration and the biggest motivators in this being the social learning opportunities such as sharing of resources and ideas, opportunities for feedback and support from peers and the opportunity for in-depth discussion around course topics.

Almost 90% of students placed value on discussion in groups when related to their studies, indicating not only that they felt that they added valuable contributions to the group but also that they received benefits from being part of that discussion group when it came to their studies and assignments.

It was also revealed that online students perceived on-campus students to be more dedicated to their studies. However, this was not seen as an opportunity, but as an additional worry that on-campus students would be directly inconvenienced by the asynchronous nature of online study:

> In some ways I think it would be better to work with another online student simply because of timing of things because obviously campus students are very much dedicated to the course that they are doing other modules etc., ... I am actually doing my course later at night and working at odd times which might be better with other online students to handle it in the same way (Online student 3).

Data also revealed that the value of creating social bonds with classmates earlier in the process is appreciated, where online students indicated that they find it easier to collaborate when the students know each other: "Better to start the collaborative work from the start of the course," (On-campus student 7). Further concerns were expressed based on the type of

collaborative setting and the allocation of roles: "Collaborative work depends on the project we are given. I believe that if it is a big project then a collaborative work is needed. However, every member should be focused on a particular part of the project" (Campus student 6).

Student concerns about isolation seem natural, considering the nature of online study. The benefits of social collaboration and inclusion were also seen for online students in creating community and combatting isolation: "Being in contact with other online students helped feeling less isolated," (Online student 4).

The tutors on the programme shared that they viewed the allocation of the roles in the student groups as something that is done independently of the teaching process delivered by them. At the same time, the data revealed that a number of online students found it necessary to naturally take on the role of a project manager in order to keep the others on track of the project progress. Such online students felt strongly that if they hadn't stepped in and taken on a managerial role, then no one else would have: "So it is basically more about managing the projects rather than actually the interaction between us that we had to figure out first…(Online student 3). This emphasizes the need for a more structured approach towards group course projects, initiated and mediated by tutors on the Masters programme. This was highlighted further by another online student: "Please consider the difference between new graduates who may need collaborative experience and professionals who may be looking for more freedom and individuality, and find it hard to juggle their study, family and work" (Online student 3).

Further information on how roles within the student groups were allocated was provided by the assumption from on-campus learners that the time of their online peers is very limited and they have to work more efficiently when group discussions are concerned:

> I think if there is an online student. He cannot be online all the time. So we have to discuss quickly, we have to be more focused on the topic. (On-campus student 4)

It also appeared that the behavior of on-campus students changed when they had an online colleague. They shared that they would have to work quickly as the time an online student had available was limited. This view was mirrored from an online learner, who indicated that their study pattern was disturbed when the collaborative work started:

> …actually, on the first semester, everything was going smooth, everything was fine and when this collaborating thing happened that when I felt the stress of the course (Online student 3)

Such behaviour could be interpreted as natural in a professional working environment,

where social conversations are less common, in contrast to the life style of an on-campus student where social connections with peers are an integral part of the university experience.

Conclusion

The biggest motivators for group work for both on-campus and online cohorts are focused on sharing resources and ideas, receiving feedback from peers and the inclusion of community. There is still hesitation around the concept of grading group work at group level with students preferring to either work alone on assignments or that their individual work is recognized and graded rather than that of the group. The value of social engagement and strategic brainstorming is highly recognised, therefore going forward, the focus should be on student interactions that trigger learning mechanisms.

It would appear that the most successful examples of collaborative projects delivered through a cross-cohort setting occurred when an online student took on a leading role and managed the workload of the rest of campus team. Further insights into influence on the campus group from an online colleague emerged in situations where the campus groups had to be more organised for meetings and keep the conversations focused solely on the project when their online colleagues were present through the computer screen. This proposes a base for further research into the dynamic of the social relationship between students in a cross-cohort setting and the effect of this dynamic onto group course project. This opportunity is already being explored in the Masters programme in Digital Media Design through one of the core courses, which requires group work. A number of students from the online cohort have been assigned to work with one of their peers from campus, thus the on-campus student is acting as the 'live' link between tutors and on-campus students. There is also scope for further incorporation of the social and community building aspects of online and on-campus collaboration, to assist the creation of a shared studio environment intended by the creation of this cross-cohort programme.

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