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# Students' motivation and ownership in a cross-campus and online setting

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This study focuses on student motivation and ownership of learning in a team-based learning environment that is situated in a cross-campus and online context. Data were collected through semi-structured interviews from 12 students who participated in a joint international Master's degree in Music, Communication and Technology programme between two large Nordic universities. The aim of the study was to identify factors that were most likely to impact student motivation and ownership in this cross-campus and online setting. Three main themes emerged from the analysis of data relating to student motivation and ownership. These three themes were autonomy, peer learning, and communication and social bonding. The study has the potential to contribute to the continued development of future learning environments, which will be physical as well as virtual, or a mix of those. The findings indicated that there is a need to focus on student tasks that should be flexible and open for student choice, and where peer learning is one of the main learning strategies used to engage students. Additionally, the findings also highlight the importance of having a focus on communication and social bonding in the planning and organisation of cross-campus and online courses in order for universities to succeed and to transform to meet the needs of a very diverse group of current and future students.

## KEYWORDS

cross-campus, online learning, team-based learning, peer learning, motivation, ownership

## Introduction

With a growing proportion of the adult population undertaking higher education, it can be argued that not all students will have the intrinsic motivation to learn or even to know how to learn. According to [Beardsley et al. \(2020\)](#), one third of the students in a university course were not motivated to learn how to learn. Therefore, there is a need to help students to acquire the ability to learn effectively and to understand what they want to learn. [Conley and French \(2014\)](#) argue that student ownership of learning is a key component for students in upper secondary to ensure that they are ready for college or university. The ability for students to take ownership of their learning will be a key factor to their success, not only in

their university career, but also throughout their lives, and therefore, it should be a part of their learning experiences (Conley and French, 2014; Case, 2020).

In this paper, the term “motivation” is used in accordance with Keller (2008) five principles of motivation to learn. Keller (2008) claims motivation to learn is promoted when;

1. “a learner’s curiosity is aroused due to a perceived gap in current knowledge,”
2. “the knowledge to be learned is perceived to be meaningfully related to a learner’s goals,”
3. “learners believe they can succeed in mastering the learning task,”
4. “learners anticipate and experience satisfying outcomes to a learning task,”
5. “learners employ volitional (self-regulatory) strategies to protect their intentions” (p. 178).

The use of the term “ownership” in this paper draws on the work of Thibodeaux et al. (2019) where they identify several dimensions of ownership. Each dimension “brings with it a learners perceived degree of control of tangible and intangible elements, expectations of self and others, perceived ability to reach goals, and feelings of belonging” (p. 52).

Various attempts have been made in recent years to focus on increasing student motivation in higher education, for example, with a focus on increasing student autonomy through a more open and authentic design of learning environments and processes (Buchem et al., 2020). However, this can be challenging for educators in an “ordinary” learning setting with students on campus undertaking mainly face-to-face learning experiences. It will be even more challenging in a cross-campus setting when a significant part of the activity is online (Raes, 2022). In team-based learning, where student collaboration on problem solving tasks is essential (Experts in Teamwork, 2023), the cross-campus and online setting will challenge both educators and students (Raes et al., 2020). It will not be easy for the educators to connect to and supervise students that are online and work at a different campus. For students, the situation can be even more challenging when they collaborate both on campus, and online across campuses at the same time. This is where the important role of digital technologies needs to be emphasised and used in a way that supports students to achieve the intended outcomes. Simply substituting digital technologies for prior pedagogical practice is potentially detrimental to students’ learning (Escueta et al., 2017), whereas, innovative and transformative uses are potentially much more beneficial to student learning (Fullan et al., 2018).

In this paper we aim to identify the factors that are most likely to impact motivation and ownership for the given tasks, and the learning of subject related content in a cross-campus and online setting. We explore students’ evaluation of the learning activities in a cross-campus Master’s degree programme in Music, Communication and Technology (MCT). Information from students at this programme are of special interest since this is an international degree programme, with students enrolled from multiple international countries. Thus, the student’s background and experience will also vary from a much larger global context. This may influence how the students respond to a learning situation

with a high degree of freedom, and the possibility to choose which project to invest their efforts into, and, to some extent, the subject related content that they want to focus on. The programme is of interest to the researchers as it is a cross-campus based programme with a high level of student activity and collaboration in a fully online environment. The significance of exploring student’s perceptions related to learning in diverse settings are in accordance with the work of Thibodeaux et al. (2019) and Buchem et al. (2020). They specifically highlight the need for further exploring how students from different backgrounds respond to high degrees of freedom in these types of learning environments. In particular, and related to the learning environment described in this paper, Buchem et al. (2014) found that the value of specific elements of control may vary between learners from different national and academic cultures.

It is hard to predict what lies ahead for the future of higher education, however it can be argued that there will be an increased need for flexible multi-campus study options in order to provide further opportunities for lifelong learning and further education (European University Association, 2021). This will provide students with opportunities such as studying close to their home area and/or even combining further education with work and family commitments. Thus, there is a need to investigate the factors that stimulate motivation and ownership in a cross-campus and online situation. In the present study we aim to answer the following question: *Which factors are most likely to impact on student motivation and ownership in team-based learning in a cross-campus and online setting?*

In a recent study, Nykvist et al. (2021) described the educators experiences with the MCT-programme. The study highlighted that there was a need for educators to focus on developing student ownership of learning. One of the main issues identified in this study with regards to ownership, was the need for transparency in the assessment process. In designing the learning experiences for students, the educators reported on the need to engage learners through collaboration, critical thinking, communication and creativity. In the present study we will describe the students’ experience with the MCT-programme. This will be explored through a qualitative case study with data collected through semi-structured interviews with students in the programme.

## Theoretical background

Buchem et al. (2020) argue that psychological ownership has been related to improved performance, as well as other positive personal and organisational factors in several fields of the job market. They claim that the theory of psychological ownership has now also been extended to education. Allowing learners to take ownership of their learning is identified as allowing learners to engage with the process itself, which is a crucial factor for the effectiveness of the learning process (Biggs and Tang, 2011). Owusu-Agyeman and Fourie-Malherbe (2019) argue that there is a need for continuous improvement of curriculum and pedagogy in higher education. For this improvement to be successful, students should be included in this process with their input into the teaching and learning processes. This can be seen as a negotiation of co-ownership, however, Bovill et al. (2016) underscore the need for

transparency in the process. [Aiken et al. \(2016\)](#) further argue that the process for developing a course at the university needs to prioritise student ownership, and help students to engage in their educational contexts while also learning how to self-monitor. This process has a flow on impact that will make it easier for students to participate in higher education courses, thus possibly also increasing student retention.

The focus on ownership and motivation goes back to Dewey's ideas around Experience and Thinking in Democracy and Education: an introduction to the philosophy of education (1916) where he argues that the learner must be involved, must be touched by the situation and theme in order to learn. This may either influence his or her life directly, or it is a theme that is of interest to this person and therefore they try to gain more insight or control over it. In order to involve or touch the learner various attempts have been made in higher education. In the case of this study the focus is on ownership and motivation.

The following literature will describe findings from studies on student choice, control and ownership since these have been guidelines for the planning of the MCT programme, which is the case in the present study. Literature regarding e-portfolio's will also be discussed as this is used in the assessment process in the MCT programme.

The possibility for students to be motivated and to have a feeling of ownership of their learning, are seen to be interwoven and mutually supportive, and have been considered as critical issues for learning ([Buchem et al., 2014](#); [Thibodeaux et al., 2019](#)). [Thibodeaux et al. \(2019\)](#) argue that when learners are given choice, they become vested in the experience and take ownership of the learning, which in turn can facilitate positive learning experiences. [Aiken et al. \(2016\)](#) also highlight the importance of student choice that will foster engagement and a vested interest in the learning experience. They claim that students who are truly engaged in their own learning process, and use their own ideas, will take control over their learning. This is of increased importance in project- and team-based learning where it is essential that students have a high level of commitment to the tasks that need to be solved ([Experts in Teamwork, 2023](#)).

Recently, research carried out from a socio-constructivist perspective, placed focus on learners' control through a more open and authentic design of learning environments and processes ([Buchem et al., 2020](#)). As a consequence, and in order to facilitate choice and student control, educators must offer a range of relevant tasks for students to choose from and also the possibility for students to focus on a choice of related subject content.

[Thibodeaux et al. \(2019\)](#) explain how students' choice, ownership and voice is closely linked together and have a positive effect on learner's motivation and autonomy. They further highlight that student choice, ownership, and voice must be nested within an authentic and significant learning environment in order to positively influence learning. Furthermore, they point out that metacognitive practices should be built into the programmes in order to help students to take ownership of their learning. If students are expected to replicate content, then there is little room for metacognitive skills to further develop ([Thibodeaux et al., 2019](#)). According to [Landis et al. \(2015\)](#), to assist learners in taking ownership of their learning, there should be a focus on the importance of student reflection. [Pierce et al. \(2001\)](#) describe how ownership of learning makes up five dimensions: sense

of responsibility, self-identity, accountability, self-efficacy, and belonging. In each of these the learners' perceived degree of control is central. However, expectations of self and others, perceived ability to reach goals, and feelings of belonging is also part of the process according to [Pierce et al. \(2001\)](#). Student ownership of learning is focussed on the student learning to learn and understanding what they want to learn ([Conley and French, 2014](#); [Owusu-Agyeman and Fourie-Malherbe, 2019](#); [Beardsley et al., 2020](#)).

[Barrett and Wilkerson \(2004\)](#) discussed the use of portfolios and argued that there needs to be learner ownership of the content, purpose and process for their success. They claim that greater learner control would lead to more intrinsic motivation, thus reinforcing the need for learner's to have some autonomy over the learning process in order to promote motivation and ownership. [Thibodeaux et al. \(2017\)](#) focus on how ePortfolios can contribute to a more authentic learning experience, if learners first develop a sense of control and ownership over the learning process and are allowed to publish their portfolios to a real audience, that is outside the university. Similarly, [Bass \(2014\)](#), argues that learners should be allowed to showcase their ePortfolios to authentic, external audiences, including peers and learning networks for feedback and collaborative work. Likewise, [El-Mowafy et al. \(2013\)](#) also argue that students should be engaged in relevant activities that promote learning. [Buchem et al. \(2014\)](#) argue that learner control through the use of an ePortfolio, in the development of Personal Learning Environments (PLE), should allow the learners to determine their own learning goals, while also selecting and aggregating a wide range of available (not necessarily pre-selected) tools, negotiating rules, initiating (and not only engaging in) discussions and collaborations and adjusting learning based on self-monitoring the learning progress. In this context, the relationship between control, motivation and ownership is mutually supportive. It is within this context that [Shroff et al. \(2013\)](#) also highlighted that both students and educators considered the feeling of control as vital for the ownership of an ePortfolio.

In summary, the literature presented here highlights the impact of student choice, control and voice in order to develop motivation and ownership of student learning, and that these dimensions of learning are interwoven and mutually supportive. Learning environments must be seen as authentic and significant, or relevant, by the students. Any actions that are taken in order to increase motivation and ownership, should also be taken at an individual level related to student choice and voice. For example, individual choice can be demonstrated through the use of ePortfolio's, and a collective approach can be seen when students are involved in the planning of content and the organisation of a course.

All these perspectives were central to the planning and organising of the MCT-programme. A search of current literature related to a cross-campus setting and student motivation and ownership revealed limited studies in this area. Recently, [Ma and Lee \(2021\)](#) found that students in a blended learning environment were more satisfied than both pure online and traditional face-to-face students. The blended learning environment also aroused students' curiosity and interests and contributed to their confidence in order to achieve their learning goals. In a literature review on hybrid teaching and learning, [Raes \(2022\)](#) found that students present on campus, compared to pure online students, had a higher score on affective engagement, including intrinsic motivation, relatedness, experienced pressure, cognitive absorption, autotelic

experience, sense of presence and sense of belonging. This may indicate that a cross-campus setting, with students present at two or more campuses, is a better situation than having some students only online.

In light of the increased need for flexible multi-campus study options now and in the future (European University Association, 2021; Ma and Lee, 2021; Miller et al., 2021), there is an urgency to identify the factors that impact motivation and ownership of learning in learning environments where students often need to collaborate in a combination of face-to-face and online environments. It is in this context, that this paper will examine how student motivation and ownership of learning is evaluated by students in a cross-campus and online learning environment.

## Materials and methods

The data in this paper are based on semi-structured interviews of 12 students ( $N = 12$ ) in the MCT programme, a joint Master's programme in Music, Communication and Technology located at two different universities in Norway, the University of Oslo and the Norwegian University of Science and Technology (NTNU) in Trondheim. While both major universities are located in Norway the students come from a more global context with students located across several countries and time zones. The semi-structured interview questions were designed in order to prompt discussion from the students, and to allow the interviewer to delve deeper where needed with more specific follow-up questions. The students consisted of 10 males ( $n = 10$ ) and two females ( $n = 2$ ) between the ages of 27 and 58. Five students ( $n = 5$ ) were enrolled in the programme in 2018, and seven ( $n = 7$ ) in 2019. The twelve informants consisted of both Norwegian and international students. All the interviews were conducted online *via* Zoom, audio recorded, and then transcribed.

## About the MCT-programme

During the first round of the programme in 2018, half of the students were located in Oslo and the other half in Trondheim. A portal was constructed in order to facilitate collaboration between the two campuses (Stöckert et al., 2019). The aim was to use technology that allowed collaboration within groups across campuses. The second round of the programme was impacted by the COVID-19 pandemic and teaching and learning therefore had to go fully online. As a result of this impact, students were located in their own home areas in Norway and internationally.

In a recent paper (Nykvist et al., 2021) the educators of the MCT programme have described that student active teaching approaches were at the centre of this programme. Subject related content in the form of scientific papers or as videos produced by the educators, or in short lectures given in accordance with the principle of "just-in-time-learning" (Dewey and Dewey, 1915; Riel, 2000) would be given prior to a learning session with students. The subject related content knowledge was given when the students needed it in order to solve the challenges in their projects, or as a necessary background for their projects. Hands-on and theoretical problem solving were at the centre of the learning experiences,

when students and educators met on campus and online, in a hybrid environment, or fully online. The programme collaborated with *Experts in Teamwork* (2023) at NTNU in order to teach and train students in team-based learning activities.

In the MCT programme students have a high degree of freedom to decide on what tasks they want to invest effort in, and also, to some extent, which subject matter content they want to study. Students could choose to focus their learning at two levels. Firstly, they could choose between several courses for half of the credit points in the programme, and secondly, they could choose between sets of relevant tasks during the workshops within a given course. A typical workshop consisted of activities over a 14-day period. In addition, the first round of students built their learning environment called "the portal," with the use of low latency communication technology and improving the audio quality of the physical rooms on each of the campuses. Part of their ability to make a choice, was therefore related to which part of "the portal," for example physical or technical issues, and which technology they chose to use and develop. The programme collaborates with several private companies and many of the tasks that students work on are problems that need to be solved at these companies (see MCT, 2020).<sup>1</sup>

The MCT programme was chosen as a case for the present study because it is a new forward-looking programme at each of the universities, and it is focussed on the development of knowledge rather than the reproduction of information, as well as having a focus on further developing and reinforcing 21st century competencies (Lee et al., 2016). Furthermore, the programme is international and open to students from all over the world. The programme is also complex in the way that the two physical campuses are located at two different universities, which caused several barriers related to culture and routines, as well as administrative tools. Thus, several factors not related to learning, may be quite contentious to the students. Another reason for choosing the MCT programme as a case is that this programme was planned and started as a cross-campus and online programme prior to the COVID-19 pandemic. Thus, the close down of the universities during the pandemic should not have a significant impact on the teaching and learning processes associated with the programme.

After transcription all the interviews were analysed by the use of an inductive thematic analysis going through the six steps described by Braun and Clarke (2006). After the coding of the text within each interview [step 2 as proposed by Braun and Clarke (2006)], the themes in the data were identified and developed by gathering all the codes from the interviews under a given theme [step 3 and 4 as proposed by Braun and Clarke (2006)]. Finally, each theme was described in condensed texts which were supported by examples from the individual interviews [step 5 and 6 in Braun and Clarke (2006)].

During the process of analysis, the members of the research team, with a minimum of four of five members at any one time, sat together and discussed the meaning of each sentence and paragraph of the transcription, and agreed first on the coding and thereafter on the development of themes, taking into account the considerations by Braun and Clarke (2019, 2021) on reflexive

<sup>1</sup> <https://mct-master.github.io>

thematic analysis. The aim was to secure a rich reading of the data and to develop stories about particular patterns of shared meaning across the dataset. As described by [Braun and Clarke \(2019\)](#) “Themes are creative and interpretive stories about the data, produced at the intersection of the researcher’s theoretical assumptions, their analytic resources and skill, and the data themselves” (p. 594). The researchers involved in this study all have experience teaching in higher education, though with different professional backgrounds. In the development of the themes, perspectives from pedagogy, language, educational technology and natural science would therefore be brought into the study. It is within this context that this paper will report on and discuss the themes developed in relation to “motivation and ownership.”

## Results/findings

The analysis of the interviews revealed that the students strongly related to the notion of motivation and ownership of learning and identified them as important elements to this programme. Based on the statements from the students, related to motivation and ownership, three themes emerged from the data in order to describe how motivation and ownership would be facilitated in a cross-campus and online situation. These themes are; the need for autonomy, the importance of peer learning, and the need for good communication and social bonding. Each theme will be elaborated on through a description of the interpretive story about the pattern in the data. This will be further supported with statements from students in order to explain and support important perspectives related to the theme.

### Autonomy

The need for autonomy and the ability for students to realise their own ideas and interests is central to the development of motivation and ownership. There should be enough flexibility in the projects so that everybody could find a topic to work on within their field of interest and competence.

Different choice possibilities and variations in background experience and competence supports learner motivation and ownership. One student put it this way:

*“...we could really choose what we wanted to do and I have a lot of ideas and I know what I want to do, and this freedom in the courses we had was very precious to me.”*

The choice possibilities should also open up for choosing individual work:

*“But to perhaps be able to work on individual projects at my level, in a way, that would have been very nice. So, if I had been really interested in working on one particular thing that might not be relevant to anybody else, to be able to just go after that.”*

However, personal interest and learning preferences can also be a barrier to students:

*“...when it comes to interests like because in a group-situation each person has different interests. Sometimes it’s, maybe for some projects it doesn’t really work.”*

*“So like sometimes if you don’t have like kind of interest, it’s very hard to like contribute, but it’s, I think it’s also like a personal thing, like what you want to contribute, yeah.”*

On the other hand, students pointed out that there should be guidelines and a framework for those students who need support:

*“I think sometimes there were a kind of some students may have wanted more guidelines for what was going on, for others maybe creatively inclined or more familiar with that sort of project set-up. . . .”*

*“a lot of students are saying the difficulty of dealing with completely new subjects when you have to learn by yourself.”*

### Peer learning

Peer learning and collaboration is one of the most important learning activities identified in the data. The students came from different fields within MCT, and they therefore also had the opportunity to learn from each other’s areas of expertise during the project work. This will be facilitated by the fact that a significant part of the time students work in teams on real life problems, brought up in collaboration with the industry.

Collaborative learning was new to many of the students, however, it can be seen as a very positive element for student learning. One student said that:

*“I learn a lot of by other students, like, in working with these in workshops, like, so and by myself, yeah, so, it’s quite, it’s a new experience I mean. I think it’s really good because in, you learn from each other. I mean I have learned a lot from other students, like how they did something certain things and I ask from them and they show me and then discuss.”*

Another student compared peer learning with a more traditional setting in lectures, and claimed that peer collaboration gave more insights into your own level of knowledge:

*“Yeah, and everyone around you collaborate and communicate about the content and you know better where you are, you see where the others are. And if you are in a traditional setting, you just listen and then you basically just study by yourself.”*

In the context of peer learning, students also raised the need to see their peers as a valuable source for learning. Different possibilities and variations in background, experience and competence supports both peer learning and learner motivation. One student said:

*“I think that’s the thing that I prefer with this master’s is that we are all coming from different fields and we are really learning from each other and this is really great, I think.”*

Another student put it this way:

*“I think the fields we are all specialised in are so different and some people are very good at their stuff and I can easily say that some students are much better than the teachers in their field so they are the best to teach this.”*

However, the potential of peer learning may not be realised due to how the projects are organised by the educators. Limited timeframes often leads to students focussing on using previous competence instead of challenging themselves, and consequently avoiding areas where their knowledge is limited. This has the potential to influence both the learning outcomes and ownership of the project:

*“...so you have sort of worked with what you can do from before then to a large extent, rather than perhaps tackling areas where you are a little weak, and built your own expertise in those areas. because many of the modules have been very limited - two weeks - so it is very busy.”*

One student illustrated the problem in this way:

*“Like if you have one week to develop a project in a completely new programming language, and you’re not a programmer, it’s very- it can be a bit stressful. It stresses parts of this, but we could have more support in this case.”*

Factors relating to their peers were also mentioned as obstacles that could reduce their motivation and ownership. These factors included differences in language and culture, individual problem-solving strategies, lack of competence and understanding of prerequisites for succeeding in group projects. One student said:

*“Of course, there were also instances where I could not contribute somehow or not as I wished. But then I feel disrespect. Everyone probably had those moments, probably.”*

## Communication and social bonding

The importance of peer learning is closely linked to the third perspective brought up by students: the importance of establishing good communication internally amongst the group on campus, as well as online with other group members located at the other campus. However, communication and social interaction takes time and needs to be facilitated and learned. The personal chemistry and relationships of each group member are essential to the success of any group project. Group dynamics cannot be ignored in a cross-campus learning environment. Collaboration needs to be learned and students need to understand the prerequisites for succeeding in team-based projects. One student said:

*“I think the important thing is if we have a strong group union between the students and, of course in-class, the professor is supportive at some points, to some extent, then it works really well because it pushes the students to make it by themselves. The motivations, our ideas are our own projects, so it’s, for me, it’s very effective, but I think it would depend a little bit on the group dynamics sometimes because if we get a complex project and half of the group is not aware of the topic, for example, then it’s a bit of a struggle, but still it’s an effective way to learn.”*

Other students described it this way:

*“...very good if you are put in groups with someone you work well with, and can work less well if you are put in groups that don’t work so well.”*

*“But when it’s between people, between teams, it’s important to make people be friendly. We have, of course, a good team, but as much as we can be closer it can be better. It helps in this case.”*

One student highlighted the importance of educators that thought about how students could best interact as well as the tools needed to support the interaction:

*“...in the first semester, we were introduced to one of the best ways to interact with each other, to communicate. Communicative tools. What is the best way to react to this or that situation and I think they were good.”*

Students also said that it is important to be able to communicate on a separate channel where educators do not have access:

*“And there we have a channel where we basically ask each other about anything, but there it is also possible to have such one-to-one conversations and create groups and the like.”*

*“And it’s not only related to work, so we can be more friendly there. More free to express ourselves to each other and stuff and actually we help each other a lot through discord with the issues we face during our projects.”*

Students claimed that multi-campus locations did not impact on their ability to collaborate with others:

*“I did not feel that it was an obstacle because someone was in Trondheim while I was in Oslo.”*

However, students also recognised that it is easier to talk to people in-person:

*“I still feel that if someone is in the room it will be easy to talk, I don’t know why I feel that way, it’s yeah, I mean.”*

“...it can be a bit tiring to have that communication, digital communication - especially over Zoom.”

Several steps were taken by the educators in order to facilitate communication and social bonding across campuses. One was to organise at least one physical meeting in the beginning of the first semester. One student described the success of that meeting:

“Yes, I think that was very important. It was, yes it I think it was very like that, you get a picture of people very quickly, then you have the opportunity to talk to people a little more one to one, yes no I think it was very important.”

## Summary

Regarding subject related content and tasks given in the projects, students highlighted autonomy as being important for motivation and ownership to learning. They needed to be able to choose between several project ideas in order to follow their interests and build new knowledge. All students saw peer learning as one of the most productive learning activities. However, they need time to overcome barriers, for example related to language and culture and lack of competence, and to develop the projects by involving the expertise of all the group members. Students also highlighted the value of good communication and social bonding within the groups. This can be seen as a prerequisite in order to realise the potential in peer learning. A cross-campus learning environment appears not to be a barrier to either peer learning or communication and social bonding, given that technology for communication and project management was available to all students. Surprisingly, assessment was not a theme brought up by the students in the context of motivation and ownership. The students also did not raise the COVID-19 pandemic as a negative factor related to motivation and ownership.

## Discussion

Regarding the research question, “Which factors are most likely to impact on student motivation and ownership in team-based learning in a cross-campus and online setting,” students first highlighted the importance of autonomy which made it possible for them to follow their interests and needs for knowledge. This goes back to Dewey (1916) who claimed that the learner must be involved, must be touched by the situation and theme in order to learn. More recently Thibodeaux et al. (2019) pointed out that there is a personal value associated with the ability to choose. The focus on autonomy in our findings is linked to the learner’s possibility to choose the project that they will work on and also, within a framework, what subject related content they want or need to focus on. This is central to giving student’s control over the learning process. Supporting this notion, several studies (for example Pierce et al., 2001; Barrett and Wilkerson, 2004; Landis et al., 2015; Aiken et al., 2016; Owusu-Agyeman and Fourie-Malherbe, 2019; Thibodeaux et al., 2019) have highlighted the need for autonomy in order to develop student motivation and ownership. It is within

this context that we argue that autonomy is the basis for motivation and ownership to be developed. Without this ability for students to have choice over their learning and follow their interests, it is hard to understand how intrinsic motivation and ownership can be developed.

In addition, Thibodeaux et al. (2017, 2019) claim that elements of control must be nested within an authentic and significant learning environment. In accordance with this, the educators in the MCT programme aimed to offer students authentic tasks in the projects through a collaboration with industry partners (Nykvist et al., 2021). However, in order to plan for autonomy and authenticity in teaching and learning activities, educators may need to spend more time planning for these learning activities (Nykvist et al., 2021). This will involve spending more time and energy on planning for multiple tasks that can meet a range of interests, as well as making contact with industry partners and other actors outside the university. Compared to what is usually the tradition in universities, the degree of freedom needs to be significantly increased in student driven projects and students need to be engaged in relevant activities that promote learning (El-Mowafy et al., 2013).

According to our findings, differences in language and culture, individual problem-solving strategies, lack of competence and understanding of prerequisites for succeeding in group projects, all related to team-based projects, were seen as barriers for the work in the projects. This means that students need to be taught how to organise the teamwork in a project, and how to collaborate with people with different backgrounds. This is still another challenge for the educators and Idris et al. (2019) also notes this as a challenge in a similar study on international students. Idris et al. (2019) noted in their study that some students met challenges in the collaboration with peers as a result of language, communication, and socio-cultural factors, as well as incongruent learning priorities. In our study students brought up that there should be guidelines and a framework for those students who need that kind of support. Supporting this finding, O’Keeffe and Donnelly (2013) highlighted that learners reported the need for support for the freedom to choose in an authentic learning environment. In the MCT programme educators included training in team-based problem solving (Xambo Sedo et al., 2019; Experts in Teamwork, 2023) to support the students.

A more surprising finding in the present study is that students described how peer learning and the psycho-social aspects related to communication and collaboration were central to their development of motivation and ownership. While much of the literature related to motivation and ownership has an individual focus on each student’s ability to take control over the learning process (Pierce et al., 2001; Barrett and Wilkerson, 2004; Landis et al., 2015; Aiken et al., 2016; Owusu-Agyeman and Fourie-Malherbe, 2019; Thibodeaux et al., 2019), our study found that the need for collaboration and learning by interaction with other students appears to be the most important aspect related to developing motivation and ownership. Additionally, a recent study by Lorås et al. (2020) has also highlighted the importance of informal learning spaces where discussions between students and educators were at the centre of the teaching and learning process. This is something that the students commented on during the semi-structured interviews. The lack of problems related to COVID-19 may also be explained by the already established online collaboration and informal learning, and the use of online learning

channels already being used by the educators and the students through the learning portal. Thereby the fully online situation forced upon both students and educators as a result of COVID-19, did not change the teaching and learning situation significantly.

Previous research on peer-related learning has for the most either been on peer-assessment or on peer-assisted learning, where students higher up in the system teach and support students on basic courses. For peer-assessment, positive effects on students' learning have already been documented in existing research (Boud et al., 2018). Peer-assisted learning has also been shown to be beneficial in an on-campus setting, but the effect is not conclusive in an online setting (Tibingana-Ahimbisibwe et al., 2022). In our study, students described the positive experience of learning by collaboration with peers in the same project. There are few reports of this type of peer learning in a hybrid or fully online setting, but in a recent study, in a similar situation and also involving international students, Idris et al. (2019) found that peer learning improved the students' academic performance.

The ability for Students to focus on autonomy, peer learning and communication and social bonding may also be supported by another finding in our study. This is the students' lack of focus on assessment during the interviews. Usually, assessment is seen as one of the main factors influencing student effort and engagement (Gibbs, 1999; Boud et al., 2018). The reason why students did not see assessment as a factor influencing their motivation and ownership may be linked to the high level of autonomy in this Master's programme where they could follow their interests both in the projects and regarding subject related content. Therefore, a student's effort may be more interest driven than motivated by assessment in the MCT programme.

While the students in our study claimed that the cross-campus and online situation did not impact on the positive effects of peer learning and effective collaboration in the projects. The importance of communication and social bonding will inevitably cause more challenges in a cross-campus and fully online situation, especially for the educators and their planning. One of these challenges will also be the necessity of a physical meeting early in the programme so that students get to know each other. The cost related to a physical meeting will impose additional costs on the students, and usually increase by the distance between campuses (and countries). Students in the present study described the physical meeting in the start of the first year of the programme as a success and a necessity, as well as a prerequisite for the team-based work on projects. Brouwer et al. (2022) found that students helped each other more often when they are already friends and students who helped each other academically are more likely to become friends. However, they did not find evidence that peer relationships in learning communities influence academic performance. Raes (2022) compared conceptual understanding between physical and remote presence among students, assuming that students present at campus can maintain closer connections with peers, but found no difference between the groups.

Another challenge related to social bonding that will be more complicated in a cross-campus and online situation will be for students and educators to organise meaningful social activities throughout the semester. It is not possible to go out together as a whole group, and several activities that can be exercised locally and linked together over the internet, may be complicated due to differences in time zones. Additionally, Stöckert et al. (2020) found

that mediating technologies influenced the experience of presence negatively, but that formal learning scenarios were less affected than informal. During the COVID-19 pandemic we have seen serious effects, both on the quality of life and learning, due to students spending too much time at home alone (Nurunnabi et al., 2020).

## Limitations

Like many other qualitative studies, this study has a limited number of informants, who were recruited from only one Master's programme. The findings will therefore apply to the programme in question, and cannot necessarily be generalised. However, we believe that our findings show the potential related to peer learning and student autonomy in the context of student driven team-based project work. Flyvbjerg (2006) argue that we also need knowledge based on single case studies and also claim that knowledge that cannot be formally generalised, however, "can certainly be of value (...) and has often helped cut a path toward scientific innovation" (p. 227).

All the students that were interviewed in this study revealed a high level of engagement in their projects and teamwork, despite the possible obstacles that may be linked to a cross-campus and online situation. They were all at a Master's level, so we might expect a higher commitment to their work. Therefore, other patterns of engagements may appear in other groups of students, for example students at lower levels.

The same argument also applies to the MCT programme. For example, the high level of student commitment and lack of problems related to the cross-campus situation could be attributed to the fact that student driven projects were central to the programme.

## Conclusion and further research

The most important take-away from our study is that there is a need to focus on human interaction and team-based work where peer learning is central in order to offer students high quality learning arenas. First and foremost, these are challenges related to paedagogy, and need to have a top priority when educational institutions plan new learning environments and experiences for students. This will apply to teaching and learning in general, but will also place additional challenges on a cross-campus and online situation. Therefore, we believe there is a need for change compared to what traditionally has been the focus until now, where much of the resources and effort have been put into physical and technological infrastructure.

The informants in our study are students at a Master's level. We therefore need more research on how students in their early years of their university career tackle the ability to choose between subject content matter to delve into, and how they invest time and effort into the projects they choose to develop. Likewise, we cannot assume that students from all cultures will appreciate the autonomy given to them and cope with the responsibility and need for communication and collaboration related to peer learning. Further research should therefore consider some of the cultural

differences that may influence these factors and the effect that they have on motivation and ownership. Since the present study is qualitative, with a limited number of informants from one study programme, qualitative studies covering several programmes, study levels and cultural settings should be further developed.

The university of the future needs to include both physical as well as virtual campuses where knowledge is co-produced rather than transferred. The position of peer learning and collaboration should be further evaluated in the context of team-based student driven projects in cross-campus and fully online learning environments. The focus on technological infrastructure, as has generally been the case when educational institutions plan new learning environments, appears to be of less importance, though should support all in a seamlessly integrated way.

## Data availability statement

The datasets presented in this article are not readily available because data may be identifiable in some cases to certain people. Requests to access the datasets should be directed to DL, [dag.atle.lysne@ntnu.no](mailto:dag.atle.lysne@ntnu.no).

## Ethics statement

The studies involving human participants were reviewed and approved by the Norwegian Centre for Research and Data. The participants provided their written informed consent to participate in this study.

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## Author contributions

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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