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PAPER

# Hybrid Learning through Lecture Capture: Exploring Perspectives and Overcoming Challenges with Blackboard Encore Technology

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**ABSTRACT**

The COVID-19 pandemic has resulted in significant disruptions in higher education. Despite UK universities returning to in-person teaching, many international students still face travel restrictions imposed by their home countries, resulting in remote learning for many students at the beginning of the 2022–2023 academic year. To ensure a seamless academic transition for all students, a British university has implemented a hybrid learning model that utilizes lecture capture technology, specifically Blackboard Encore Streaming, to provide face-to-face and remote students with access to the same learning experience. This paper presents the findings from two online focus groups with students (n = 18) and two staff reflections, which aimed to explore the perspectives of teachers and students on the new Encore Streaming feature. The results indicate that both teachers and students value the hybrid approach, with remote students appreciating the flexibility and convenience of this approach more than face-to-face students. However, the study also reveals significant discrepancies in teacher attention and student participation opportunities between remote and face-to-face students, attributed to pedagogical and technological barriers. The study highlights the crucial role of teachers in orchestrating the hybrid classroom to ensure equal learning opportunities for all students and identifies areas where teachers require support, such as training, staff time, and technology support.

**KEYWORDS**

hybrid learning, lecture capture, streaming, higher education

## 1 INTRODUCTION

The COVID-19 pandemic has wreaked havoc on higher education institutions around the world. Many teachers and students at universities were forced into the unfamiliar territory of online education [16] [21] [30]. As the years have passed since the outbreak, universities have become better equipped with both online and

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offline teaching methods, allowing them to move toward a more balanced approach to teaching and learning. However, research warns that excellence in face-to-face teaching and online teaching may not be sufficient to prepare universities for an effective transition to a hybrid learning approach [22]. There is an urgent need to explore what is meant by hybrid learning for universities and to address issues such as how to balance technology and pedagogy [17].

As a result of the pandemic, several countries have imposed travel restrictions, leading to a significant number of international students beginning their studies at UK universities as remote starters at the beginning of the 2022–2023 academic year. These students would transition to in-person teaching once they were able to travel to the UK.

To ensure that remote starters were not at a disadvantage, a British university implemented a hybrid learning approach that adopted lecture capture technology (Blackboard Encore Streaming), enabling both face-to-face and remote starters to participate in the same learning environment. This paper presents the findings from two online focus groups with students (n = 18) and two staff reflections to explore the perspectives of students and teachers on the recently introduced Encore Streaming feature on Blackboard, one of the most prevalent virtual learning environments (VLE) in higher education. Results revealed how teachers and students use Encore streaming in their practices as well as the challenges staff face when incorporating this new technology into higher education teaching and learning.

## 2 LITERATURE REVIEW

### 2.1 Hybrid learning

Hybrid learning has received considerable attention from educational researchers, particularly in the field of higher education research. However, a consistent definition of the term remains lacking [7]. Researchers often use the term interchangeably with online learning, blended learning, and mixed-mode learning [5] [9] [14] [20] [29]. Klimova and Kacetl define hybrid learning as a mixture of instructional modalities, delivery media, instructional methods, and web-based technologies [7]. Colis and Moonen consider the term a combination of face-to-face and online learning so that instruction occurs both in the classroom and online, with the online component attempting to act as a natural extension of traditional classroom learning, as cited in [18]. In this research, we adopt this definition, considering hybrid learning as a mode of delivery where in-person learning and remote learning take place at the same time, with support from educational technologies.

The concept of hybrid learning is not new to higher education. However, traditional face-to-face teaching remains the dominant mode of instruction in universities. Since the outbreak of the pandemic, universities around the world have been quickly forced to switch from traditional face-to-face teaching to remote teaching [21]. Researchers initially reported negative feelings toward remote education among teachers and students due to technical, pedagogical, and behavioral barriers [17]. The trial and error of a year of remote teaching has nonetheless improved universities' positions to offer online learning. As the world enters a post-pandemic era, universities in the UK are starting to bring back face-to-face teaching while retaining the online teaching elements in order to tailor the needs for students of various learning modes (e.g., distance learners, campus learners, and remote starters). In light of

this, there emerges a new question, which is how can universities bridge the gap between online and in-person teaching to ensure equal learning experiences?

### 2.2 Lecture capture

Lecture capture often refers to the recording of face-to-face teaching sessions in order to make them available for later viewing [8] [11] [31]. It typically includes audio and visual resources, which are supported by educational technologies such as Echo360.

Studies have shown that lecture capture offers several benefits, such as fostering deep learning, facilitating student revision, and providing a means to make up for missed courses [10] [19]. Notably, lecture capture has been found to provide increased flexibility for students, including distance learners, when accessing lecture contents [3]. Furthermore, research has shown that lecture capture supports students with language barriers and special learning needs [6] [12]. However, researchers also highlight concerns regarding lecture capture, arguing that it could lead to a breach of intellectual property and a reduction in student attendance [3] [13].

Since the COVID-19 outbreak, there has been a sharp increase in universities that utilize lecture capture to mitigate the impact of the pandemic on student learning [8]. As in-person teaching makes a return to campuses, universities start to unlock a new function of lecture capture, allowing face-to-face teaching to be broadcast live for remote learners. Different from synchronous-only teaching, lecture streaming involves teachers physically delivering a lecture in front of a group of students while the audio-visual content of the lecture is simultaneously broadcast to remote learners. This creates a hybrid learning space that brings together face-to-face and remote learners in ways that otherwise would not be possible due to geographical barriers. Blackboard Encore, supported by Echo360, is one of the educational technologies that offer the live streaming function of in-person teaching for the purpose of a hybrid learning experience. Considering that this live streaming functionality was only recently introduced to formal education, little research has been conducted to examine its impact on learning and teaching practices [2]. It is, therefore, important to gain insights into how teachers and students perceive the usefulness of Encore in facilitating hybrid learning and identify any technological or pedagogical barriers that form throughout this hybrid learning process.

## 3 METHODS

The purpose of this qualitative study is to investigate the use of Blackboard Encore for hybrid learning at a British university. It has the following objectives:

1. To understand the perspectives of teachers and students towards hybrid learning.
2. To identify challenges and opportunities regarding the use of streaming technologies for hybrid learning.

This study employed a qualitative research design, specifically using two online focus groups to gain insight into the hybrid learning experiences of students. These focus groups included nine face-to-face students and nine remote students who were asked about their experiences with Blackboard Encore and how they felt about the use of streaming technologies in hybrid learning environments.

In addition, the study invited two teachers to reflect on their experiences teaching in a hybrid environment using the Encore system. These teachers were asked to provide their opinions on their use of Blackboard Encore for hybrid teaching and any pedagogical challenges they encountered when using the system.

The data collected from the focus groups and teacher interviews were transcribed and analyzed using the six phases of thematic analysis, which included data familiarization, coding, searching for themes, reviewing themes, defining themes, and producing the final report [1]. An illustration of the coding process can be found in Figure A1 in the appendix.

The project has obtained ethics approval from the University of [anon], and all participants have given informed consent. Identifiable data has been removed, and participants were informed of their right to withdraw without any harm.

To enhance the construct validity of the interviews, a pilot phase was conducted involving two students and a staff member. Their feedback and input were sought to refine the interview questions and ensure they effectively captured the intended constructs of the study. In order to ensure the reliability of the research, participants were also invited to provide comments on the analysis of the anonymized data. By involving participants in the analysis process, the aim was to establish agreement and consistency in the interpretation of the data, thereby enhancing the overall reliability of the findings.

## 4 RESULTS

The analysis of student focus groups and teachers' reflections shows that students and teachers are in agreement when it comes to the value of the hybrid learning approach put forward by the university. However, barriers exist that hinder a fully successful implementation of a hybrid learning approach, such as a lack of interaction between remote students and face-to-face students within classrooms and technological barriers to instruction from the perspective of teachers.

### 4.1 Attitudes toward hybrid learning

Despite the general agreement among participants that a hybrid learning approach via the Encore Streaming system could mitigate the adverse impact of the pandemic on education, the findings of the focus group interviews conducted as part of the study reveal that face-to-face students tend to have a more positive learning experience compared to their remote counterparts.

This preference for face-to-face learning is attributed to the reduced technological barriers that face-to-face students face in comparison to remote learners. In traditional face-to-face learning environments, students can directly communicate with their instructors, ask questions, and receive feedback without the need for technological intermediaries. On the other hand, remote learners have to navigate various technological tools such as video conferencing software, learning management systems, and chat platforms, which can often present difficulties and complications that hinder the learning experience.

As a result of this discrepancy in learning experiences, face-to-face students perceive the hybrid teaching approach as primarily targeted at remote learners rather than as a solution that could also benefit them. This perception leads them to believe that the hybrid approach is not as beneficial to them as it is to their remote

counterparts. Consequently, they may be less motivated to embrace the hybrid approach, despite its potential to enhance their learning experience. They may perceive the hybrid approach as a temporary alternative to bring benefits to their remote counterparts.

*'I was very lucky that my flight took off on time. I can attend campus classes and talk to my lecturers and classmates. I guess it's bad for those students still waiting for their flights. So, I think hybrid teaching is good for them so that they don't miss too much teaching. But I don't see the benefits for us campus students.' [Face-to-Face Student, Male]*

*'I don't consider this to be hybrid learning, as it feels no different than attending in-person lectures at my previous university, with a lecturer at the front and classmates seated next to me.' [Face-to-Face Student, Female]*

Despite the fact that face-to-face participants show a more positive attitude towards hybrid learning experiences, it is worth noting that the study also found that remote starters had a greater appreciation of the hybrid learning approach compared to face-to-face students. This finding is significant as it highlights the potential benefits that the hybrid approach can offer to remote learners who face unique challenges and circumstances that can impact their learning opportunities.

One of the main concerns raised by remote learners is the potential impact of travel disruptions on their ability to attend classes and keep up with their studies. With the hybrid approach, these students have access to online learning resources that can help them catch up with their studies quickly and efficiently once they arrive at the university. This access to online learning provides them with a level of flexibility and convenience that can help them stay on track with their academic goals.

Furthermore, the hybrid approach also gives remote learners a sense of belonging and community within the university. Even though they may not physically be on campus yet, the hybrid approach provides them with a sense of connection to their peers and instructors, making the transition to face-to-face learning more seamless and less daunting. This sense of community can be especially important for remote learners who may feel isolated or disconnected from the university.

*'I can only find a flight to the UK in week four. This means I would miss five weeks of teaching, including intro week, if I didn't have hybrid classes.' [Remote Starter, Male]*

*'Although my learning is online for now, knowing someone is sitting in a lecture theater learning at the same time makes me very excited to join them.' [Remote Starter, Female]*

## 4.2 Pedagogical barriers to hybrid learning

Although Encore streaming enables both face-to-face and remote students to listen to lectures at the same time, the two cohorts of students do not have the opportunity to interact with each other. Remote starters often felt marginalized in class compared to their face-to-face peers and are more likely to be affected by a lecturer's teaching style (e.g., inclusive teaching). For example, one of the remote starters felt that teaching is often geared towards face-to-face students, with lecturers only occasionally checking on remote students to see if they have any questions. Remote student learning is, therefore, highly dependent on lecturers being aware of remote students' questions and providing them with timely support.

The use of Encore streaming technology in education has brought about many benefits, such as allowing both face-to-face and remote students to attend lectures simultaneously. However, despite this advantage, there are certain drawbacks to this approach, particularly regarding the interaction between the two cohorts of students.

One significant issue identified by our focus groups is that remote students often feel marginalized in class compared to their face-to-face peers. This can be due to a variety of factors, including limited opportunities for interaction and engagement with the lecturer and other students. Remote students are also more likely to be affected by a lecturer's teaching style, which may not be inclusive of their needs.

For instance, some remote students may feel that lecturers primarily cater to the needs of face-to-face students and only occasionally check on remote students to see if they have any questions. This can create a sense of isolation and disengagement for remote students, which may ultimately impact their learning experience.

*'I asked a question on the online forum while the lecturer was explaining a concept. It took the lecturer until the end of the session to answer my question. If he had answered it right away, like he did for face-to-face students, I would have understood the lecture content more easily.' [Remote Starter, Female]*

As a result, remote student learning is heavily reliant on lecturers being aware of their questions and providing them with timely support. It is crucial for lecturers to adopt inclusive teaching practices that account for the needs of remote students and ensure that they feel equally valued and supported in the learning environment.

Although remote starters value the presence of their face-to-face classmates, the opposite cannot be said. According to one of the face-to-face students, he does not feel any difference between face-to-face learning and hybrid learning. This suggests that more work needs to be done to merge these two learning communities.

*'It was only when the lecturer stopped teaching and turned to talk to her PC that I realized there were remote learners in the class. For a second, we thought she was losing it.' [Face-to-Face Student, Male]*

### 4.3 Technological barriers to hybrid learning

According to the teachers' reflections, they encountered a number of barriers when delivering hybrid sessions. First, teachers reported a lack of confidence in implementing the systems due to their unfamiliarity with hybrid teaching. There was not enough training provided to them at the beginning of the term to prepare them for the transition back to campus and for the new delivery model.

The transition to hybrid teaching models in response to the COVID-19 pandemic has presented challenges for many educators. In particular, teachers in this study have reported encountering a number of barriers when delivering hybrid sessions. One of the most significant challenges that teachers have faced is a lack of confidence in implementing the systems due to their unfamiliarity with the hybrid learning approach.

Both teachers have been accustomed to traditional in-person teaching methods and have limited experience with remote or hybrid teaching models. As a result, the sudden shift to hybrid teaching has left them feeling unprepared and uncertain about how to effectively engage both face-to-face and remote students simultaneously. This has resulted in a lack of confidence and proficiency in using the new delivery model.

In addition to a lack of familiarity with hybrid teaching, teachers also reported that there was not enough training provided to them at the beginning of the term to prepare them for the transition back to campus and for the new delivery model. The rapid shift to online and hybrid teaching models meant that they had to quickly adapt to new technologies and teaching practices without adequate training and support.

*'I feel overwhelmed going back to face-to-face teaching after a year of online teaching. And, now, I have to teach face-to-face and remote students at the same time. I have never heard of this streaming function before. There is no training for us and only a few online instructional videos.' [University Teacher, Female]*

Furthermore, the teachers reported that they felt less in control when interacting with remote students due to technological barriers. According to teachers' reflections, the Encore system can automatically broadcast face-to-face lectures. This requires teachers to stand close to the microphone on the main monitor so that remote students can hear clearly. Additionally, Encore does not have a chat box or audio feature that allows remote students to communicate with their teachers or face-to-face students. Teachers often have to rely on third-party software, such as Jamboard, to collect questions from remote students, which they then read out in class. In other words, the teacher is the only connection between face-to-face and remote students. Consequently, teachers are under considerable pressure to divide their attention to accommodate the needs of both groups.

*'When I deliver a lecture the hybrid way, I don't have control over the main monitor. I just have to hope that the lecture was broadcast successfully.' [University Teacher, Male]*

*'I used Jamboard to interact with remote students. This means I have to request a laptop from the university to bring to the class. While I'm on my main monitor for teaching, I need to check on face-to-face students as well as keep an eye on Jamboard on my laptop. I felt exhausted after each lecture.' [University Teacher, Female]*

### 4.4 Insufficient teaching support

In addition to the pedagogical and technological barriers mentioned above, both remote students and teachers have expressed concerns about the lack of necessary teaching support. These challenges have made it difficult for remote students to receive timely assistance and feedback, for teachers to effectively manage hybrid classrooms.

Remote students, in particular, have identified the need for a teaching assistant to help with managing their questions and feedback. Due to the limitations of virtual communication, remote students often struggle to receive timely responses to their queries, which can hinder their learning experience. A dedicated teaching assistant could help bridge this gap by managing the flow of questions and feedback between the students and lecturer in a timely and efficient manner.

Similarly, teachers have expressed a preference for duo teaching, which involves pairing up with another teacher to help manage the hybrid classroom and boost their confidence in managing the class. This approach allows teachers to work together to facilitate discussions between both cohorts of students and manage the flow of information more effectively. However, teachers have also raised concerns about the lack of recognition of duo teaching from the academic department. Although they are willing to support students and colleagues using duo teaching methods, their staff teaching hours are not calculated into their workload, which prevents them from contributing to other classrooms other than their own.

*'My colleague and I considered supporting each other's classes. Having someone manage the synchronous chatbox with remote students would enable me to focus on delivering content and interacting with students more comfortably. But our department manager denied us teaching hours, leaving me hesitant to ask for voluntary help.' [University Teacher, Male]*

*'I would appreciate some additional teaching assistants or teachers to help facilitate our chatroom. If someone can answer my questions on time or voice my questions to the lecturer, I will feel less confused and also part of the student community.' [Remote Student, Female]*

## 5 DISCUSSION

The global pandemic caused by COVID-19 has forced universities to adapt to a new teaching approach known as hybrid learning. Hybrid learning combines face-to-face and online learning, providing students with flexibility and convenience, enabling them to access course content and participate in class discussions from any location. To facilitate hybrid learning, live streaming technology such as Blackboard Encore has become an essential tool. Through analyzing focus group interviews and teacher reflections, this study explored the use of the Blackboard Encore Living Streaming feature in the context of hybrid lectures from the perspectives of both students and teachers.

The study found that students appreciated the flexibility and convenience of hybrid learning. Remote students, in particular, found it beneficial, as they often struggled to attend classes on campus due to flight restrictions at the beginning of the term caused by COVID-19 [22, 32]. This aligns with the findings of other studies which show that remote students benefit from Blackboard synchronous learning during the pandemic [2, 21]. By using the Blackboard Encore live streaming feature, remote students could participate in class discussions and engage with course content. Additionally, face-to-face students found the use of Blackboard Encore beneficial as they could access course materials and recorded lectures outside of class time.

Despite the benefits of hybrid learning, the study revealed challenges faced by both teachers and students in this new teaching environment. The most significant challenge was the discrepancy in attention and participation opportunities between remote students and their face-to-face counterparts. The study found that remote students received less attention from lecturers and had fewer opportunities to participate in classroom activities than face-to-face students. This disparity was further compounded by the lack of interactive features available on the Blackboard Encore system, which restricted remote students' learning opportunities. This is consistent with Hebebci's findings, which emphasized the limited interaction between remote students and teachers [4]. However, our study suggests an additional layer of restricted interaction between the two cohorts in a hybrid classroom, with some face-to-face students unaware of their remote counterparts' presence, leading to a lack of community in the hybrid classroom.

The study highlights the importance of teachers in orchestrating successful hybrid classrooms. The role of teachers in facilitating student learning has been extensively documented in both face-to-face and online classroom settings [23–24]. Research across various educational contexts consistently acknowledges the pivotal role of teachers in creating a safe and inclusive environment and providing timely feedback that fosters active student engagement and participation [25, 26]. Our research highlights the increased significance of the teacher's role in the context of hybrid learning. It emphasizes how teachers play a vital role in facilitating the learning and engagement of two cohorts of students, namely those participating in face-to-face instruction and those joining remotely. The findings underscore

the importance of teachers in bridging the gap between these two student groups, ensuring equitable opportunities for learning, and fostering active engagement and participation.

The findings suggest that teachers may lack experience effectively teaching in hybrid classrooms. This lack of experience can be attributed to limited training and confidence in hybrid teaching methods, aligning with the findings of prior research [15] [28]. It highlights the need for comprehensive training programs and support systems to equip teachers with the necessary skills and confidence to navigate the unique challenges of hybrid instruction successfully. The finding underscores the need to provide technological and pedagogical support to teachers transitioning to the new hybrid learning environment. Such support could include training on the use of online tools, providing access to technical support, and providing teaching assistants or allowing staff time to conduct duo teaching to support each other.

The study's findings resonate with previous research, highlighting the importance of technological advancements in hybrid classrooms to promote equitable learning opportunities for all students [27]. To address this need, one potential solution is the development of interactive tools and features that enable both cohort students to actively engage in classroom discussions and activities. These tools may include interactive whiteboards and real-time polls that promote meaningful interactions among students, regardless of their physical location. In addition, providing teachers with additional training and support regarding these new tools is crucial for creating engaging and interactive hybrid learning environments. Educators need to be equipped with the necessary knowledge and skills to effectively integrate and utilize these technologies in their teaching practices. Training programs can focus on demonstrating the functionalities and benefits of these tools, showcasing best practices for their implementation, and offering strategies to foster student engagement and participation in hybrid classrooms.

It is important to note that the data for this paper was collected at the start of the term, when teachers and students were quickly being introduced to a hybrid learning approach. Participants in this study faced significant concerns and challenges during that time period. The paper was exploratory in nature and did not have a large sample size. Future research should build on the results of this study by exploring the teaching and learning experiences of hybrid learning through large-scale surveys or over a longer period of time. Future studies could also explore other types of educational technologies for hybrid learning at multiple higher education institutions.

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# 7 APPENDIX

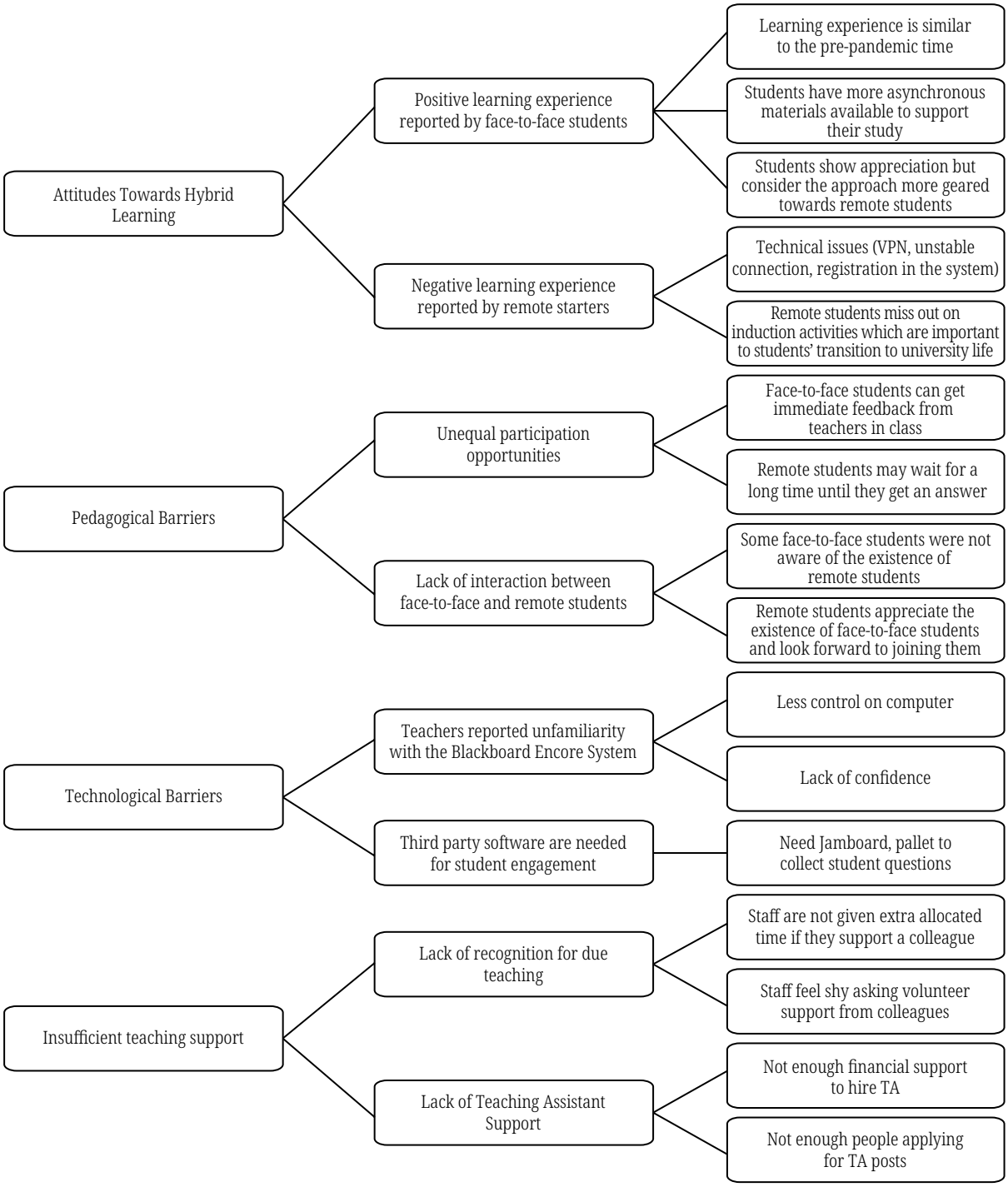


**Fig. A1.** An illustration of the initial codes

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