

# Guidelines for Designing an Effective and Positive Emergency Remote Learning Environment for College Students

Sarah Churchman  
Georgia Institute of Technology  
North Ave NW  
Atlanta, GA 30332  
schurchman3@gatech.edu

## ABSTRACT

This research study analyzed data collected from undergraduate and graduate students from colleges in the states of Georgia and Alabama, all of whom experienced emergency remote learning. Inductive thematic analysis was used because of its flexibility and ability to decipher common themes and their relationships. A survey was conducted with 25 respondents and semi-structured interviews were conducted with 14 students. Survey and interview questions covered the themes of icebreakers, connection, mental health, technology, and consistency as well as basic demographics. Further analysis of the themes formulated 6 guidelines for creating an effective and positive remote learning environment for students. The results of this study are the following guidelines: instructors should take a few minutes at the beginning of each class to allow students to share and celebrate positive things in their lives, breakout rooms should be utilized as a tool for creating connections between classmates, instructors should encourage the creation and use of independent communication channels between students, instructors should encourage every student to turn on their camera, instructors should occasionally check in with their classes to see how people are feeling about class or life in general and educational institutions should adopt a set of standard guidelines for conducting an ERL class and provide training to instructors on how best to use the technologies available. This study concludes that an enormous burden was placed on students and instructors and without any preparation or training for Emergency Remote Learning, the level of student connection suffered.

## Keywords

emergency remote learning; emergency remote teaching; connectedness; online interaction; COVID-19 pandemic, social connection; online collaboration

## 1. INTRODUCTION

The COVID-19 pandemic presented a litany of trials and tribulations to people across the globe, but college students struggled with their own unique set challenges including “student engagement, motivation, social connectedness and feedback” [1]. However, it could be argued that the biggest of the challenges was the hurried transition from in-person learning to Emergency Remote Learning (ERL). This shift was unexpected and abrupt, which caused considerable distress and shock among both students and teachers [2].

Emergency Remote Learning (ERL) is defined as “...the unplanned and sudden shift from the traditional form of education into a remote one following the state of emergency...” [5]. However, another term for ERL has been presented in literature: Emergency Remote Teaching (ERT) which is defined by Hodges, et al. [2020],

as “...a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances”. These terms are used interchangeably but for the sake of this study, we will continue to use the term ERL since this paper focuses on the student point of view.

ERL differs from traditional online learning in course design and the tools used for evaluation [5]. Conventional online learning courses can take 6 to 9 months to develop because “...effective online learning aims to be a learning community...” and seeks to aid students with co-curricular engagement and other means of social support [3]. The sudden implementation of ERL strategies is in “...direct contradiction to the time and effort normally dedicated to developing a quality course...” and should not be seen as a long-term solution [3].

Capturing student experiences in a timely fashion was imperative to truly understanding the personal stories of college students from March 2020 through February 2022. Memories fade and vital, intricate details get lost as time progresses. To acquire these experiences, an initial study was conducted from January 2021 through April 2021 that sought to produce timely knowledge on platforms and practices that better supported student course engagement and feelings of connectedness during remote education. That study provided the foundation for this current study, which sought to elaborate on the topic of student connectedness, focusing on the connections between the student and classmates, the student and course content, and the student and instructors, and finally what technologies and strategies helped foster these connections.

This study sought to answer the research question: What are some guidelines that can be used by educational systems to help design an effective and positive learning environment for students during Emergency Remote Learning? by conducting a survey and semi-structured interviews with participants who were full time undergraduate or graduate students during the COVID-19 pandemic lockdowns. This research led to data which, upon analysis, yielded themes leading to the creation of 6 guidelines for helping educational systems design an effective and positive learning environment for students during ERL. Those guidelines are:

1. Revisit topics brought up in icebreakers throughout the semester. A focus on positive aspects of students’ lives can help set the tone for classes.
2. Use breakout rooms as a tool for creating connections between classmates.
3. Encourage the creation and use of independent communication channels between students.

4. Encourage all students to turn on their cameras.
5. Inquire into the wellbeing of students throughout the semester
6. Adopt a set of institutional guidelines for conducting an ERL class and provide training to instructors on how best to use the technologies available.

In this paper I will discuss work related to the topic of Emergency Remote Learning, provide more details of the study, discuss each of the guidelines in depth and how these guidelines are beneficial to instructors, administrators and learning content designers in fostering student connections.

## 2. RELATED WORK

Due to recent introduction of the subject of ERL, the existing field of literature is not as developed as compared to traditional face-to-face instruction or even online classes. However, much of the research in online learning is applicable to ERL situations.

### 2.1 Education During COVID-19

COVID-19 brought to light “emerging vulnerabilities” in education around the globe and it is apparent that education systems need to be “flexible and resilient” as we head into the unknown of the future [4]. The social isolation brought on by COVID-19 stressed the real need for constructive tools to support quality remote learning and teaching, as well as tools that offer collaboration and social connection with fellow students [1].

Unfortunately, the speed with which things occurred, with schools and universities closing, did not allow for the finely crafted online course. Instead, instructors were forced to rapidly get *something* online which “...is in direct contradiction to the time and effort normally dedicated to developing a quality course” [3]. The adoption of an online learning space isn’t only “...a technical issue. It is a pedagogical and instructional challenge” [4].

A South Korean study of college students during the COVID-19 pandemic revealed that since those classes conducted online had been hastily designed more by administrators than instructors, they did not “demonstrate sufficient quality” and that both instructors and students had problems adapting to emergency remote learning [2]. In conclusion, the authors suggest providing an easy-to-understand manual for instructors and students since ERL is a relatively unfamiliar educational method [2].

In a study of Palestinian middle school students during COVID-19 restrictions, instructors, and students “...reported that the quality of the content in the ERL was lower than that in face-to-face and normal online learning” while instructors said that the unexpected situation left them stressed because they were not prepared to instruct online [5]. Instructors did not have the time to create superior content and exercises for students by following instructional design processes [5]. This study concludes by stating that COVID-19, did in fact, negatively impact student engagement during ERL [5].

To address the lack of student connection due to poorly designed and implemented courses, there is a need for specific guidelines for administrators and instructors to follow when ERL is the only mode of learning available to students. The guidelines provided by this study illustrate that small changes by instructors can enable more successful connections and engagement for students.

### 2.2 Student Engagement

A further review of the literature finds that student engagement is an important topic and one this paper directly addresses although

under the term “connectedness”. Student engagement is described as one of the main pieces of successful online teaching and it is therefore critical to find out how students connect to the class, its content and each other to create the ideal online learning space [6]. Student engagement adds to student satisfaction, increases motivation to learn, decreases feelings of isolation and enhances performance in online classes [7].

Dixon (2010) explains that based on previous research, the road to student engagement is not found in one specific type of activity or assignment, but in the myriad of ways of creating quality communication between students and the instructor - “it’s all about connections”. Since online students have less opportunity to engage with their academic institution, it is imperative to create multiple avenues for online student engagement [7]. An additional support for student engagement is found in social support by instructors and classmates [8] and the layout of the online learning environment [5].

Martin and Bolliger (2018) identify three types of engagement strategies that help foster student engagement: learner-to-learner, learner-to-instructor, and learner-to-content. These are the three types of connections directly dealt with in this research. The Martin and Bolliger (2018) study confirms the importance of those connections, and they believe it “...reinforces the belief that institutions need to design and deliver engaging learning experiences for students to succeed in online learning”.

Those connections or “engagement strategies” as they are called by Martin and Bolliger (2018), are cornerstones of my research. Interestingly, these specific connections were not originally planned as foundational parts of the research but instead developed as the survey and interviews were created and during the thematic analysis. The concept of engagement as it related to connections also developed during my research.

### 2.3 Uncertainty

A thorough literature review would not be complete without addressing the uncertainty and inconsistency encountered during ERL. Zhang et al. speak of the “...disagreement about what to teach, how to teach, the workload of teachers and students, the teaching environment, and the implications for education equity” [9]. They go on to say that while the Internet is an effective tool for instruction, it is not as effective as the only mode of instructor-student engagement [9].

The previously mentioned South Korean study also addresses some uncertainty encountered by students such as not properly understanding assignments when not in person, technical issues, and distractions such as checking social media while in class [2]. A survey of instructors uncovered that they “...felt overwhelmed and unprepared to use online or remote teaching strategies and tools and they struggled to adapt their pedagogy to fluctuating situations such as...unclear or shifting educational or governmental directives” [10].

Despite all the existing knowledge on the topic of ERL and online learning, no one has addressed the issue of technologies used by students and instructors. My research makes an initial exploration of specific technologies that were successful in fostering the feelings of connection (which are proven to be vital) between students, their course content and their instructors during the COVID-19 pandemic and subsequent lockdowns.

## 3. METHODS

For this study, an initial online survey was distributed on social media, in classes at the Georgia Institute of Technology (GT) and

via word-of-mouth. Over the course of 5 months (August 2021-January 2022), 25 participants responded. This survey included questions regarding basic demographics, their living situation during ERL, 4 Likert-type scale questions and 10 open ended questions. Participants were not asked about gender or age. Participants were largely from GT and the University of Georgia, however there were two outliers who attended Auburn University at Montgomery and the University of Alabama. This study originally set out to recruit only undergraduate students, but after running into difficulties with recruiting, the study was opened to graduate students as well. Upon later review of this survey, the questions should have been more directed towards the connections between students, content, and instructor as approximately half of the data collected was not used in the final study results. However, the survey results that *were* used proved valuable to the later thematic analysis.

Most data was collected via 14 semi-structured, one-on-one interviews. Semi-structured interviews were used to allow flexibility in the questions and to allow the interviewer to pursue other topics that might come up during discussion. The interviews were conducted from August 2021-February 2022 and were conducted via 20–45-minute Zoom calls. Once participants offered their verbal consent to participate in the study, recording of the interviews began. These recordings were then manually transcribed.

### 3.1 Analysis of Data

Upon completion of the interviews, an inductive thematic analysis of all data collected from the survey and interviews was undertaken. Thematic analysis was chosen as the method of investigation because of flexibility. “Through its theoretical freedom, thematic analysis provides a flexible and useful research tool, which can potentially provide a rich and detailed, yet complex account of data” [11]. Researchers are free to create themes without any bias, instead allowing themes to be created from the data [12]. Additionally, thematic analysis is seen as the primary method for qualitative analysis, and it provides effective fundamental qualitative analysis skills [11].

## 4. RESULTS

During the review of survey and interview results, the data was categorized using codes. These initial codes were:

- Icebreakers
- Connection to classmates
- Connection to course content
- Connection to instructor
- Mental health
- Missed experiences
- Technologies used
- Negative technology
- Positive technology
- Technology change
- Consistency

Once the interviews were coded appropriately, codes were combined to create the following larger common themes: icebreakers, connection, mental health, technology, and consistency. All data was then populated into a spreadsheet where it was organized by these themes. Table 1 provides an overview of themes generated during thematic analysis of data collected from the survey and interviews conducted.

**Table 1. Main themes relating to student connections during ERL generated from a thematic analysis of survey and interview data**

Theme	Description	Example statement
Icebreakers	Introductory activities meant to create a welcoming environment	<i>“I never found them helpful because they are very surface level and I’d never talk to them again.”</i>
Connection	Three types of connections: student-classmate, student-course content, and student-instructor	<i>“I was so unbelievably disconnected from the content... I literally treated it like a podcast.”</i>
Mental Health	The emotional state of students during ERL	<i>“I felt like knowing that other people are going through the same thing was helpful.”</i>
Technology	Technology platforms used in ERL classes	<i>“Teams is good for creating breakout rooms with their own channel and spaces.”</i>
Consistency	Lack of organization and training of instructors and technology	<i>“No one has designed something that is a fully remote collaboration...”</i>

### 4.1 Icebreakers

Participants were specifically asked about icebreakers and their usefulness in creating connections between the student and their classmates and their instructor. Out of 38 total participants, 17 students said they did not have any icebreakers while 21 students did have some sort of activity in a class.

### 4.2 Connections

Connection was the next theme to emerge. Participants answered questions regarding three subsets of connections: student-to-student (also referred to as ‘classmate’), student-to-course content and student-to-instructor. Additional questions about experiences missed due to ERL were also asked. The student-to-student connection was first addressed because social interactions between student-and-student lead to greater student engagement in an online learning space [14]. Half of the participants’ instructors did exercises to make students feel more connected to their classmates and half did not. These exercises included discussion among the class, group projects and assigned breakout rooms. The second connection addressed was that of student-to-course content. Findings show that many participants felt somewhat disconnected to course content with a few outliers feeling very disconnected.

The third connection addressed was that of student-to-instructor. Students said they were more connected to their instructors when the instructor actively participated in icebreakers and when they had access to one-on-one time.

The final connection topic covered was that of missed experiences during ERL. All the students’ responses to questions regarding

what they missed most about in person learning had to do with connections, mostly connections with other students and then connection to the physical campus environment.

### 4.3 Mental Health

A single interview question was asked of interviewees about whether an occasional mental health check-in by the instructor during class time would have been beneficial in helping them to connect with their classmates. Two thirds of respondents said that yes, they would have been beneficial.

Throughout the interviews, despite not directly asking about their mental health, many mentioned in passing how they felt during ERL or even how certain occurrences during ERL made them feel.

### 4.4 Technology

The interview participants were asked 10 questions regarding the technology they used or experienced during ERL. These covered topics such as what platforms were used and what technologies were successful in making them feel part of a community. 100% of respondents used the following technologies, either alone or in conjunction with others from the list: *Microsoft Teams*, *Slack*, *BlueJeans*, *GroupMe*, *Discord*, and *Zoom*. Other technologies mentioned include *Google Docs*, *Miro*, *Reddit*, *Gather*, *Padlet*, *FlipGrid*, *When2Meet*, *Mozilla Hubs*, *Canvas*, *Blackboard* and *HonorLock*.

The technologies with the highest positive feedback were *Microsoft Teams*, *Zoom*, *Slack* and *GroupMe* with usability and functionality being their best qualities. The technologies with the highest amount of negative feedback were the video conferencing platform, *BlueJeans* followed by *Microsoft Teams* and *Zoom*. It should be noted that both learning management systems, *Canvas* and *Blackboard*, and the popular online proctoring software, *HonorLock* were all specifically mentioned in terms of negative technological experiences.

The last technology topic addressed change. Participants were asked about what changes they would like to see in existing technology or what features might be included in a future technology. Better communication with instructors or classmates was frequently mentioned.

### 4.5 Consistency

The concept of consistency was not included in the survey or interview process, but instead came to light through conducting interviews. The lack of consistency in how technologies were used and how a class was structured by instructors was very difficult for students and caused disconnect and frustration.

## 5. DISCUSSION

The previously noted themes and the supporting data is, next, reviewed at length as well as which engagement strategies worked, and which did not.

Based on the analysis, I came up with these 6 guidelines which I will explain in detail.

1. Revisit topics brought up in icebreakers throughout the semester. A focus on positive aspects of students' lives can help set the tone for classes.
2. Use breakout rooms as a tool for creating connections between classmates.
3. Encourage the creation and use of independent communication channels between students.

4. Encourage all students to turn on their cameras.
5. Inquire into the wellbeing of students throughout the semester
6. Adopt a set of institutional guidelines for conducting an ERL class and provide training to instructors on how best to use the technologies available.

### 5.1 Revisit topics brought up in icebreakers throughout the semester

Many participants who experienced icebreakers during ERL did not find them helpful. Icebreakers are designed to create a welcoming environment and liven up discussion among participants [13]. However, my research shows that many times generic icebreakers miss the mark and that basic ones such as a student sharing their name, area of study and a fun fact or playing "Two Truths and a Lie" were prolific, but not generally seen as helpful. Some instructors attempted to be more creative by putting students in small breakout rooms, but the exercises remained the same and as noted by one student: *"It wasn't anything particularly novel or enjoyable"*. Other comments included:

*"I did not find the icebreakers helpful. They felt a bit forced."*

*"...it's one thing when you're in person and it starts a conversation and you can keep talking about it. Maybe you need different types of icebreakers for that kind of thing"*

*"I never found them helpful because they are very surface level and I'd never talk to them again."*

Other more creative icebreakers were seen as exceedingly helpful in the context of getting to know fellow students. One positive icebreaker experience was when the instructor asked the students to talk about something mundane. This exercise lessened the student's anxiety and allowed them to relax and enjoy it. The student commented that *"We enjoyed them a lot. We laughed a lot because the things people were saying were super interesting and out of context. It was the best icebreaker I had during the pandemic."*

Some participants had the same instructor for several classes and the "Celebrations" icebreaker performed in these classes received the highest positive feedback of any icebreaker. Based on this evidence, it is recommended that an instructor take a few minutes at the beginning of each class to allow the students to share and celebrate positive things in their lives, even if that is as simple as taking a shower or putting on normal clothes. Comments regarding this exercise were 100% positive and included:

*"Every class when we show up we spend the first few minutes talking about what was positive in your life in the past week or past class. I think that is an interesting way to set the tone for the class. It's a very useful experience because given the fact that there's the pandemic and life and all these other random things that are going on."*

*"...it was a good way to start the conversation and I learned interesting things about my classmates."*

Based on this data, icebreakers were most effective when used to help students connect with each other. Careful choice of topic can help with this, as shown with the "talk about something mundane" icebreaker which got students laughing and talking. However, the negative comments about the icebreaker topics never coming up again coupled with the positive reactions to the weekly celebrations activity leads me to propose the first guideline:

Revisit topics brought up in icebreakers throughout the semester. A focus on positive aspects of students' lives can help set the tone for classes.

## 5.2 Use breakout rooms as a tool for creating connections

The idea of breakout rooms came up repeatedly in the data and it is recommended that breakout rooms be used as a tool for creating connections between classmates, course content and instructors. This finding is supported by Martin and Bolliger (2018) who state instructors should form breakout groups for discussions and require students' participation. Comments from this current study on the topic included:

*"Breakout rooms and projects are where I was most connected. I had to accept the invitation to the group meetings, and I did my part with my group mates"*

*"I worked with different people every time and that definitely allowed me to virtually meet new people. I know more people in the program."*

*"Break out rooms. You'd get your work done and then just talk until the professor said it was time to come back. Any of that smaller group setting work is better for student interaction."*

To foster the student-to-course content connection, instructors focused more on discussion and less on lecture to keep students engaged, but it didn't compare to in person learning. One student even said that he felt he had lost ground educationally while experiencing ERL. *"I definitely feel like I didn't learn what I needed to learn to be in person right now in courses that build off the ones I took remotely."* Other comments included:

*"I was so unbelievably disconnected from the content. I would literally clean my room, make breakfast, go on a run. I literally treated it like a podcast."*

*"I think it was so hard to feel present when learning because I know for me I felt like I wasn't really in college because everything was happening inside our apartments. Definitely felt less connected than in a traditional class."*

Most participants responded that they were easily distracted or bored by classes that were solely lecture. To keep a student's attention, they need to be invited to participate in the content via discussions, activities, or breakout rooms.

The student-to-instructor connection was discussed at length with participants. One student noted that it would have been helpful if during the class the instructor would stop and take questions during the lecture or discussion. *"Nothing made sense because you couldn't get a professor to answer your earlier question."*

When the subject of office hours was brought up with one student, they mentioned that office hours should have been mandatory. The research suggests that students were not inclined to participate in virtual office hours even though, based on their own statements, it would have helped them feel more connected to their instructors. However, even when these one-on-one sessions were taken advantage of, they didn't work as well as in person. *"We could set up Zoom calls, but they were so awkward."*

According to data, students need to know that instructors are available and willing to listen to concerns they might have. The awkwardness factor may be present, but it ought not be seen as a deterrent from holding virtual office hours.

The final topic covered under the connections theme is missed experiences. The single most missed experience was the time spent

with their classmates and fellow students: those little conversations that occur while waiting for class to start or those discussions about course content afterwards. One graduate student stated that they wanted to meet more people but that they were robbed of the experience. Findings did not show any way to genuinely recreate these experiences in the virtual space.

The closest thing that came to mimicking the conversations-in-passing experience is the breakout room. Once the students had completed their assigned tasks, they would begin to talk with one another about various inconsequential things like one might in a hallway conversation.

Based on these findings, breakout rooms foster a greater connection between students, content, and instructors due to the privacy of the environment. Instructors would be advised to encourage student connection by forming breakout rooms for discussions, class projects, or virtual office hours.

## 5.3 Encourage the creation and use of independent communication channels between students

Beyond the breakout room, depending on the technology available to them, some instructors would create channels in *Microsoft Teams* for general student interaction. *Microsoft Teams* channels might include a "random" channel and a pet photos channel. These channels allowed students to interact with one another in a non-class related manner and to share things that they found interesting or funny. One student noted *"We usually tried to keep an active Slack or Teams channel. The instructor always seemed to make sure to set that up and made sure that it stayed somewhat active. Without having the in the classroom feel, you're missing the before and after time around class. This helped mimic that."*

Classmate connections were not only fostered by instructors, but by the students themselves. Students created spaces using various technologies for chatting about class, free from an instructor's intrusion. It is recommended that instructors encourage the creation and use of these independent channels between students. The most poignant of the comments were: *"The things that kept us engaged with other students were not something the professor was ever involved in. In private channels, you were able to talk about things without the professor being present."* and *"Group chats with your teammates or groups. Talking in real time was really nice. I liked it when classes had Teams channels for random photos."*

## 5.4 Encourage all students to turn on their cameras

Another action that helped students feel more connected to one another was simply having the camera on. Seeing people face-to-face is important in getting to know fellow classmates. Based on this finding, it is recommended that the instructor encourages every student to turn on their camera.

*"I think it was nice to see everyone's faces... I had one or two classes that were smaller and everyone had their video on, but in bigger classes no one had their cameras on."*

There are, of course, exceptions to this recommendation for various reasons such as not being in an environment conducive to camera usage or poor internet connection.

These findings show that instructors can foster student-to-student connections by encouraging the use of official and independent channels for communication. Interacting with fellow classmates is important to creating those connections and therefore camera usage

should also be encouraged. Students wanted to see their classmates. It gave them a sense of belonging within a classroom as opposed to simply sitting in their apartment listening to an instructor lecture to a faceless class.

## 5.5 Inquire into the wellbeing of students throughout the semester.

While research did not spend a great deal of time on mental health, the findings were interesting. Knowing that classmates were struggling with the same isolation, loneliness and stress helped students feel less so. Therefore, it is recommended that instructors occasionally inquire into the wellbeing of students throughout the semester. In passing, one student said *“I think we are all really feeling the toll that online learning took. I have been so overwhelmed.”* Other noteworthy comments included:

*“We had another class where the instructor would ask how was everyone feeling today and people mentioned how miserable they felt at the moment because things were so difficult. It was really good to see that other people were going through the same thing. We were all lonely in our homes.”*

*“I felt like knowing that other people are going through the same thing was helpful.”*

*“It’s a shared experience if you know that other folks are going through the same troubles as you’re going through. A sense of shared empathy...”*

However, there is a caveat to this recommendation. The four participants who felt that the mental health check-ins would not be helpful brought up a valid point that should be considered before implementing this recommendation. Many students may not be comfortable with such an exercise. One student stated, *“I would not feel comfortable getting very vulnerable in front of other students...So having this very personal conversation in front of other students is not something I want to do. I wouldn’t even want to listen to other people having very personal conversations. I would feel like I’m intruding”.*

Mental health check ins are recommended but need to be approached mindfully.

## 5.6 Adopt a set of institutional guidelines for conducting an ERL class and provide training to instructors

Students struggled to keep up with changing technology, how that technology was implemented and course design. According to Hodges et al. [2020], instructors themselves may have felt like *“...instructional MacGyvers, having to improvise quick solutions in less-than-ideal circumstances”*. Feedback on this topic was genuine and personal and for this reason we feel it is important to include some of these comments.

*“We’ve spent more or less a year and a half on these things and it still sucks. No one has designed something that is a fully remote collaboration. I don’t think that the software exists.”*

*“Instructors [are] not educated on how to use the technology and everyone uses it differently which makes it hard for the students.”*

*“Canvas is not consistent across courses. It’s difficult because it’s different for every single course. It’s a way that made me feel disconnected because I didn’t know what was going on. None of those tools made me feel connected.”*

*“The lack of organization or the lack of consistent use of the software is less of a problem when in person, but when this is the*

*main avenue for connecting with the class and people, I feel like every semester I have to relearn how to do it all because everyone uses it differently. It isn’t good having every class be different in how they organize things. That’s the biggest thing standing in my way.”*

Based on the evidence provided by this study, it is recommended that educational institutions adopt a set of standard guidelines for conducting ERL classes and that they provide training to instructors on how best to use the technologies available to them. This is confirmed by the study conducted by Zhang, Wang, Yang and Wang (2020), which suggests that conducting online instructor training can help tackle the problem of consistency. The authors go on to say that *“...preparing teachers with relevant skills through professional development...becomes crucial”* [9].

## 5.7 Technology

Next, we review some of the technologies used by students and their effectiveness in both usability and application. The top-rated technology used was *Microsoft Teams* followed by *Zoom*, *Slack* and *GroupMe*. *Microsoft Teams*, a business communication platform, had the highest positive response because of its accessibility and functionality such as creating channels, private messaging, small groups, file storage and collaboration and scheduling meetings. Also, *Microsoft Teams* ability to create a centralized location for communications with classmates, fellow students, instructors, and the department was important. Comments included:

*“I’m a Teams fan...The structure of how it’s broken down is easy to navigate and easy to create Teams for breakout groups. It’s nice to have meetings and have everything integrated into one place. It’s the bomb. I wouldn’t survive without Teams, to be honest.”*

*“I really like Teams to be honest. Within a class you can have different categories with mini group chats. It felt like a nice way to stay organized. You can upload documents.”*

*“Teams is good for creating breakout rooms with their own channel and spaces.”*

*Zoom* and *Slack* were next in highest usage and positive feedback. Participants liked *Zoom* because of its usability, some even mentioned using it outside of class for socializing with family and friends. Interviewees were attracted to *Slack* for the same reason they were attracted to *Microsoft Teams*: functionality. Note: Two respondents did say that *Teams* and *Slack* were *“kind of the same thing”* in that regard.

*GroupMe* had a high level of positive feedback as well. The main reason for this goes back to the idea of connection. Students were able to better connect with their peers since the environment was more casual. *GroupMe* was always student facilitated and was never an officially approved (by the Institute, College, or University) channel for any of the interview subjects. A student commented that *“GroupMe has connected me with my peers and other students in my courses.”*

It should be noted that the web app, *Miro*, had two vocal proponents. *Miro* offers a real time collaborative environment that the students appreciated. The web app, *Padlet*, also offers a real time collaborative environment allowing students to answer questions anonymously and thereby improving engagement.

Negative feedback from participants regarding technology proved to be just as enlightening as positive feedback. *BlueJeans* was viewed negatively for reasons such as lack of intuitiveness, problems with connectivity and problems with the chat feature.

Students complained about technology issues such as *BlueJeans* not working on their PC or how the chat must be downloaded to save it. *Microsoft Teams* followed closely behind *BlueJeans* in the amount of negative feedback provided. Complaints about *Microsoft Teams* focused on the lack of usability, file management issues and technical problems. Comments included:

*"Teams is very hit or miss."*

*"Teams made me frustrated. Not that Teams is bad, but when it wasn't functioning properly, it was adding points of frustration to things. It's really slow. These are the things I don't need during a pandemic."*

*"Teams is super laggy. I would try to incorporate Powerpoint and Excel into Teams. It would be nice to be able to share those files and collaborate on them."*

Four participants took issue with *Zoom*, two of them quite adamantly due to its habitual use and inevitable burnout. Feedback regarding existing education technologies, *Canvas* and *Blackboard*, showed usability and consistency as major problems. *HonorLock* was mentioned by two participants. Their reactions to *HonorLock* were strong and had nothing to do with usability or functionality, but instead, it was the whole concept of the program. They experienced high levels of anxiety during its use.

Not all participants attended schools that utilized *Microsoft Teams* or a learning management system and it was apparent through the course of conducting the interviews that these students struggled more than those who had some sort of school organizational technology. One student who attended a school that did not use a learning management system stated the need for something other than email to communicate with their professors. Another student mentioned the desire to privately share their screen with an instructor.

Learning management software is crucial to the organization and communication needs of college students. A central hub is needed for students to refer to for course work and to communicate with fellow students, instructors, and administration otherwise the isolation felt by students is amplified leading to even greater feelings of disconnect.

## 5.8 Benefactors

The guidelines synthesized from this research are beneficial to instructors, administrators and learning content designers in the creation of an effective and positive remote learning environment. Instructors can look to these guidelines for strategies to increase student engagement or connection to their students. Considering the specific data about technologies used and which were more supportive of connections, administrators would be advised to use these guidelines to better understand how the technologies they administer affect students, both academically and emotionally. Learning content designers can use this feedback and these guidelines to help formulate and support the design for a quality and rewarding emergency remote class.

Despite the research's focus on students as the main subject matter, it is interesting to note that 5 out of the 6 guidelines address the instructor's actions, not the students.

## 6. LIMITATIONS AND FUTURE WORK

### 6.1 Limitations

Limitations of this research study included the small number of participants that were largely from the same academic institution and the ephemeral nature of research subject. Interviewing people

regarding their experiences during the COVID-19 pandemic can be difficult because as time progresses memories fade and details are forgotten. In hindsight, interviews should have been conducted earlier in the research process to capture as much of people's lived experiences as possible.

## 6.2 Future Work

As stated earlier, the theme of consistency was not included in the survey or interviews, but instead arose from the interviews unexpectedly. This is the area where any future work might be focused. Interviewing instructors and ascertaining whether they consulted with peers and/or administration on how to conduct an ERL class would be a way to uncover some of the root causes of the inconsistencies. Additional interviews with students could also yield quality data. ERL is a reality and only more research into it will provide students and instructors with the tools they need to connect effectively.

## 7. CONCLUSION

This research study sought to answer the research question: What are some guidelines that can be used by educational systems to help design an effective and positive learning environment for students during Emergency Remote Learning. After a thorough literature review, a survey and 14 one-on-one interviews were conducted between August 2021 and February 2022. Using thematic analysis, themes were extracted from the data which were then used to create the 6 guidelines recommended by this study. Those guidelines are:

7. Revisit topics brought up in icebreakers throughout the semester. A focus on positive aspects of students' lives can help set the tone for classes.
8. Use breakout rooms as a tool for creating connections between classmates.
9. Encourage the creation and use of independent communication channels between students.
10. Encourage all students to turn on their cameras.
11. Inquire into the wellbeing of students throughout the semester
12. Adopt a set of institutional guidelines for conducting an ERL class and provide training to instructors on how best to use the technologies available.

While students did create their own channels outside of class to connect with their peers, they solely relied on the instructor to guide them through the emergency remote learning situation. A large responsibility was placed on the shoulders of instructors and as the research shows, without any preparation or training for Emergency Remote Learning, the level of student connection suffered.

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