The Impact of Technology-Mediated Interaction: Exploring New Channels for Effective Student-Lecturer Communications in Times of Disruption

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Abstract. Today, technology-mediated interaction became a significant medium for teaching and communication. The Covid-19 has affected and continues to impact the global educational systems. Everything will go back to normal, however, with “New reality”. Teaching on various virtual platforms demand distinct interaction and engagement. Consequently, the success of a virtual student-teacher relationship cannot be achieved without proper communication.

The research goal was to study the impact of technology-mediated interaction and explore new channels for effective student-lecturer communications in times of disruption. First, the research explored synchronous vs. asynchronous teaching. It discussed the advantages and disadvantages of technology-mediated learning. Second, the research examined the major tools of virtual platforms. Moreover, it compared live classes vs. pre-recorded vs. no video classes. Lastly, the research underlined the major troubleshooting tips with solutions.

The research applied quantitative and qualitative methods. Theoretical data was obtained and analyzed through available literature. The study conducted interviews and an online survey to obtain essential information on technology-mediated interaction among students and lecturers.

The results expect to fill the vacuum in teaching and computer-mediated communication in times of disruption. The research showcases the significance of student-lecturer communications for effective classroom interactions. The research provides recommendations for universities and lecturers to effectively navigate in challenging times.

Keywords: Communication · Technology-mediated interaction · Virtual classroom · New reality

1 Introduction

Student-lecturer communication in times of disruption brought many challenges. Teaching on various virtual platforms demand distinct interaction and engagement. Virtual classroom experience means that lecturers and students have capabilities to add and combine new tools to their resources. Some are easy to utilize, while some are
challenging. Moreover, the Covid-19 facilitated the teaching process to move into virtual platforms. Institutions around the globe incorporated Zoom, Cisco WebEx, Google Meet, Big Blue Button, Microsoft teams, and so on., as means for virtual classrooms. According to Daniela et al. [1], the ever-expanding digitization of various parts of society and the ever-expanding potential of various technologies, digital solutions and virtual, and augmented reality are gradually taking over the educational environment. Communication enabled collaboration and sharing of learning beyond the roadblocks.

The research goal was to study the impact of technology-mediated interaction and explore new channels for effective student-lecturer communications in times of disruption. To meet the goal, qualitative and quantitative methods were used to obtain necessary data. The research process was divided into three main phases: literature review, survey study, and interviews. First, the literature review analyzed technology-mediated sources, communication theories, and material on the Covid-19. The sources of primary and secondary data are referenced in the discussions. Second, an online survey was created to obtain evidence on technology-mediated interaction among students and lecturers. A survey study was supported by the interviews. Furthermore, in some instances, the evidence exhibited is a result of practical experience and inspection before and during the study, and as such it is not precisely credited by source.

2 Technology-Mediated Interaction in Time of Disruption

In higher education, technology-mediated interactions are regularly introduced. Some institutions have been more cost-effective, yet some not. The novel pandemic obliged institutions into technology-mediated interaction. Gomes et al. [2] argue that today the entire process of learning and teaching is present inside and outside the school campus, creating a large diversity of possibilities and learning concepts, such as e-learning, blended, mobile and cloud learning.

Digitalization pressures education sector to provide courses and programs that can accommodate future workforces. Watts [3] claims distance learning is no longer the exception in higher education. Even before the Covid-19, the demand for distance learning was increasing. Digital citizenship instructs the proper use of technologies Schrum and Sumerfield [4]. Furthermore, rapid transformation from the traditional classroom setting into virtual classrooms demands re-programming, re-designing, and re-directing learning goals and outcomes. Webster [5] states that communication, as a discipline, has its own version of purposeful, reasoning actors.

The study acknowledges that technology-mediated interaction is a valuable resource for lecturers and students, even with various public opinions. Oppegaard [6] argues that continual integration of technologies into the communication process, as a way to enhance our natural senses and abilities is a must. Moreover, the demand for traditional classroom courses are decreasing, therefore increases the supply of students for virtual classrooms. Consequently, it empowers institutions to prepare for the future with blended classrooms to meet the needs of globalization and digitalization.
The study recognizes that technology-mediated interaction builds a virtual wall in teaching and communication between students and lecturers, and vice versa. As a result, it impacts classroom expectations, challenges pedagogy, communication and learning skills, and so on.

The pandemic brought up the significance of technology-mediated interaction. It led universities to accept challenges and support teaching and communication in “new reality”. Lowenthal and Mulder [7] acknowledge that social presence resonates with people because education depends on effective communication, but communication changes when it is electronically mediated. Sooner or later, learning will go back to usual normal, however, with new twists. Technology-mediated learning experiences are becoming the norm for today’s students Henrie et al. [8].

Technology mediated interaction will always have its skeptics. The effectiveness of tools and practices depends on the capability of the person applying them Langer and Lyle [9]. Ultimately, teaching and learning in virtual, technology-mediated classrooms cannot avoid various disruptions.

Table 1. Advantages of synchronous and asynchronous instruction (developed by the authors based on Watts [3]).

| Advantages                                               | Outcome                                        |
|----------------------------------------------------------|------------------------------------------------|
| Synchronous                                              |                                                |
| Instantaneous personal and professional commitment between students and lecturers | Positive atmosphere; high morale; etc         |
| High level communication, responsiveness, and exchange between students and lecturers | Less miscommunication; better understanding; etc |
| Better student involvement into classroom discussions and topic analysis | Shyer students engage; etc                      |
| Synchronous                                              |                                                |
| Access to course materials at anytime                    | Anytime, convenience                            |
| Increased intellectual engagement                        | Explore more; research information; time to learn; |

Teaching in times of disruption enables synchronous and asynchronous instructions. Today when never, technology plays an important role in motivating and engaging learners Howard et al. [10]. Synchronous instruction is an almost real-time communication and engagement between lecturer and student, while asynchronous allows preparing course materials in advance and share.

Table 1 highlights the key benefits of synchronous and asynchronous instruction in times of disruption. Besides, it indicates some key outcomes from classroom engagement. Both styles are acceptable for online classroom, however, the significance falls on the type of subject it is. Smith et al. [11] dictate that for online instructors, it is important to provide content in multiple formats (three styles of learning: visual, auditory, and tactile), because connecting the content to the student is essential.
Furthermore, Table 2 highlights the key disadvantages of synchronous and asynchronous instruction in times of disruption. At first sight, weaknesses might not look as vital, however, it does create a long-term issue for student engagement, commitment, and continuing studies. Moreover, an effective virtual classroom engagement, conversation, and participation necessitates efficient facilitation of various technological tools. According to Titsworth and Mazer [12], typical classroom situations involve teachers, using a variety of modalities, presenting students with opportunities to select, process, retain, and use information.

The study acknowledges that there are troubleshooting in technology-mediated interaction. According to Rimanoczy [13], the roles of instructor changes, and he or she becomes more focused on facilitating learning. For example, potential troubleshooting that occur during the virtual classes are nonfunctional microphones, slow internet connection, chat discussions and un/muted microphones.

Above mentioned troubleshooting distracts the stream of the virtual class and creates misunderstandings. Allott [14] underlines that misunderstanding is not identical to communication failure. Thus, classrooms should be managed with confidence: addressing classwork and distributing materials beforehand, leaving strong impressions, and facilitating effective communications. Table 3 demonstrates crucial functions of three different classrooms, developed through practical experiences.

### Table 2. Disadvantages of synchronous and asynchronous instruction (developed by the authors based on Watts [3]).

|               | Disadvantages            | Outcome                                                                 |
|---------------|--------------------------|-------------------------------------------------------------------------|
| Synchronous   | Scheduling               | Personal and professional time alignment; etc                          |
|               | Technical difficulties    | No technical tools; No internet; No strong networks; etc               |
| Asynchronous  | Less personal approach   | Limited personal touch; less interaction; low interest;               |
|               | Miss understanding of    | Not enough explanation; limited real-time communication;              |
|               | course materials         |                                                                         |

### Table 3. Types of virtual classroom (developed by the authors from practical experiences).

| Options       | Suggestions                                                                 |
|---------------|-----------------------------------------------------------------------------|
| Live class    | a) Video is the must to show the presence of lecturer                        |
|               | b) Use screen sharing and use Chat Breakout Rooms                            |
|               | c) Use slides with Cases, Questions, Notes, Activities, etc                   |
| Prerecorded   | a) Keep video brief and energetic with low background noise                   |
|               | b) Precisely explain course material                                           |
| No video class| a) Use live chats for class engagement and interaction                        |
|               | b) Create engaging slides with notes (meaningful explanations)                |
The study affirms that students should be kept accountable to the same standards as lecturers. The same troubleshooting applies to them too. Student presentations and submissions can be done according to classroom setting, whether live, prerecord, or no video.

At last, according to McNair [15], there is a lot of talk about technology in education right now. Salmons [16] argues that today’s students should be prepared to use technology to communicate and collaborate because online communication for social purposes has become pervasive. Moreover, Bullock [17] claims that nowadays the words educational technologies bring to mind images of tablets, interactive whiteboards, and computers.

3 Research Methods and Findings

The study focuses on exploring the impact of technology-mediated interaction while inspecting new channels for effective student-lecturer communications in times of disruption.

The study began with market research. First, exploratory research was used to discover ideas, information, and insights. Second, descriptive research was used to define the characteristics of the environment institutions operated. Lastly, the causal research was used to determine the impact of technology-mediated interaction effective student-lecturer communications.

The study applied qualitative and quantitative research methods to explore and analyze available information. The research process was divided into three main phases: literature review, survey study, and interviews. The literature review included studying technology-mediated sources, communication theories, and materials on the Covid-19. Second, an online survey was created to obtain evidence on technology-mediated interaction among students and lecturers. A survey study was supported by interviews. Data obtained were used to synthesize with theoretical knowledge and draw conclusions and suggestions.

The survey data were obtained between April 21st, 2020 – June 15th, 2020. The target population was university students and lecturers. All participants willingly participated in the research. The research blended information shared from thirteen lecturers, and 111 online survey respondents. The online survey contained fourteen Likert scales, drop down, and multiple-choice style questions. Further, Interviewees were asked three questions related to technology-mediated interaction and teaching in times of disruption.

The interviews were conducted via Zoom and facetime calls, while others chose a phone call. In the interviews, the three main questions were asked: first, ‘how technology-mediated interaction impacted you?’; second, ‘what advantages and disadvantages do you see in student-lecturer communication in times of disruption?’; lastly, ‘share your thoughts on the future of classroom teaching (traditional, virtual, or blended classrooms)’.

Furthermore, in some instances, the evidence exhibited is a result of practical experience and inspection before and during the study, and as such it is not precisely credited by a source.
In the study, 74.8% of respondents were students (Freshman-Senior), 15.3% were students (Master-Doctor), 7.2% were lecturers (University), and 2.7% were teachers (High School).

The study asked respondents to rank, 1-being least, 5-being the most. How important was effective communication during virtual classroom teaching/learning? From 111 respondents 4.5% ranked “1”, 11.7% ranked “2”, 15.3% ranked “3”, 39.6% ranked “4” and 28.8% ranked “5”. Additionally, 45.9% respondents supported technology-mediated interaction/communication while, 39.4% said “maybe” and 14.7% said “No”.

The study asked respondents, how was their virtual classroom experience? Table 4 illustrates that from 111 respondents 10.8% ranked “1”, 21.6% ranked “2”, 41.4% ranked “3”, 20.7% ranked “4” and 5.4% ranked “5”.

| Table 4. Virtual vs. traditional classroom experience. |
|-------------------------------------------------------|
| Classroom experience                                   | Virtual | Percentage | Traditional | Percentage |
|-------------------------------------------------------|---------|------------|-------------|------------|
| Number   | Percentage | Number   | Percentage |
| 1        | 12      | 10.8%     | 6           | 5.4%       |
| 2        | 24      | 21.6%     | 34          | 30.6%      |
| 3        | 46      | 41.1%     | 30          | 27%        |
| 4        | 23      | 20.7%     | 34          | 30.6%      |
| 5        | 6       | 5.4%      | 7           | 6.3%       |

Further, the study asked, how was their traditional classroom experience? Again, Table 4 illustrates that from 111 respondents 5.4% ranked “1”, 30.6% ranked “2”, 27% ranked “3”, 30.6% ranked “4” and 6.3% ranked “5”.

The study investigated student and lecturer performances in virtual classrooms in times of disruption. Therefore, the first question asked was to rank your, as student’s performance. From 111 respondents, 5.4% ranked “1”, 17.1% ranked “2”, 36.9% ranked “3”, 35.1% ranked 4, and 5.4% ranked 5. Compared to the lecturer’s performance where 8.1% ranked “1”, 16.2% ranked “2”, 38.7% ranked “3”, 31.5% ranked 4, and 5.4% ranked 5.

The study asked, level of engagement into traditional or virtual classroom activities? Table 5 illustrates that from 111 respondents, 10.8% selected “Traditional”, 33.3% selected “Virtual”, 12.6% selected “in both”, 9% selected “None of them”, 24.3% selected “More or less virtual” and lastly, 9.9% selected “More or less Traditional”.

Moreover, the study inquired regarding platforms used for virtual classes. From 111 respondents, 31.5% replied Zoom, 9% replied WebEx, 29.7% replied Google Meet, 20.7% replied Microsoft Teams, and 9% replied BigBlueButton. Further, 64.9% selected “Live-Video Class” as preferred method, compared to 24.3% “Pre-recorded class”, and 10.8% “No Video class (only sound)”.

The Impact of Technology-Mediated Interaction: Exploring New Channels 809
Furthermore, the study was interested in how much of the following excuses/expressions were used by respondents. From 111 respondents 26.1% have used “microphone is not working”, 36.9% “slow internet connection”, 16.2% “Chat discussion”, and 20.7 used wearing headphones/earbuds, and mute/unmute microphone. At last, 70.9% indicated that technology-mediated interaction encourages, engages, and creates efficient teaching and communication. Though, 13.6% suggested “No” and 15.5% “Maybe”.

To continue, interviewee 7 indicated that virtual classroom responsibilities completely changed daily routines. It impacted personal and professional life. The interviewee explained that the big reason for this unanticipated experience was not enough training to lead virtual classrooms, and technical capabilities. In contrast, the interviewee believed that future holds on blended classroom teaching.

Interviewee 5 mentioned that the future is in digitalization, however, technology-mediated interaction will take some time. There are many pros and cons in student-lecturer communication which only has a strong value in traditional classroom settings. The future of virtual classroom influence is unknown and only can be predicted. In contrast, interviewee 11 argued that student-lecturer communication is most influential via virtual classroom compared to traditional.

From the online survey, the study can argue that technology-mediated interaction was ranked positively. Moreover, respondents accepted to support technology-mediated interaction/communication as a future long-term classroom. 45.9% of respondents indicated “yes” opposed by 14.7%, where 39.4% said “maybe”.

Respondents evaluated their experiences through virtual and traditional classroom. From results, the study argues that a traditional classroom has a slight advantage over virtual classrooms. According to the figures, the virtual classroom was ranked “2” by 21.6% compared to 30.6% of the traditional classroom. Further, the “3” ranking was used more for virtual classroom 41.4% against 27%. And lastly, ranking “4” with 30.6% was used for traditional compared to 20.7% to the virtual classroom. Interviewee 6 underlined that students seemed more communicative into virtual classrooms, which gave additional motivation to be more prepared with additional activities to further interaction.

| Type of classroom         | Number | Percentage |
|---------------------------|--------|------------|
| Traditional               | 12     | 10.8%      |
| Virtual                   | 37     | 33.3%      |
| In both                   | 14     | 12.6%      |
| None of them              | 10     | 9%         |
| More or less virtual      | 27     | 24.3%      |
| More or less traditional  | 11     | 9.9%       |

### Table 5. Engagement into traditional or virtual classroom activities.
The study investigated respondents’ self-critique and evaluation of virtual classroom performances. Respondents mostly ranked by “3” and “4” their classroom performance with 36.9% and 35.1% compared to 38.7% and 31.5% for lecturers. The study indicated that respondents seemed equally confused regarding adapting to the technology-mediated interactions. Only, 10.8% selected “Traditional” compared to 33.3% for “Virtual”. Besides, 12.6% selected “in both” in contrast with 9% who selected “None of them”. And finally, 24.3% selected “More or less virtual” contrasted to 9.9% selected “More or less Traditional”.

Technology mediated interaction will not happen without platforms. 31.5% indicated Zoom was used for teaching compared to 9% WebEx, 29.7% Google Meet, 20.7%, Microsoft Teams, and 9% BigBlueButton. The study understood that usage of various platforms depended on institutions’ financial capabilities on which programs to purchase for high volume interactions. Each platform has different capabilities, that are efficient with full versions. Moreover, not all platforms are available globally. Interviewee 2 indeed confirmed that Microsoft Teams was a platform university had to use, while causing many unnecessary troubles and disruptions. Lastly, numerous respondents indicated a low internet connection as a major troubleshooter.

4 Conclusion and Recommendations

The study recognizes that technology-mediated interaction in the classroom is a huge challenge, however, if/when purposefully addressed it could bring long-term benefits to the institutions. Flexible classroom, open education or even blended classroom expects learners to be more accountable for the learning.

Going back to normal means that universities need to adapt into a new reality. Students and teachers have to be equipped with the best tools to facilitate high quality teaching and communication. Technology mediated interaction is not going away. Hence, institutions should continue investing in platforms and software to create an interaction and communication beyond barriers.

To explore the impact of technology-mediated interaction, data was collected with qualitative and quantitative methods. The obtained data were synthesized and analyzed with theoretical and practical knowledge. Qualitative information was processed thoroughly while quantitative data applied where applicable. The outcomes of the interviews and surveys were beneficial. It helped the research to receive genuine feedback on studying and learning during the pandemic.

Although the study outcome is based on the experience of a small research segment, this can be an efficient way of analyzing the impact of technology-mediated interaction into universities.

Based on the research, the study provides the following suggestions:

- Ensure chosen virtual platforms and software’s are examined and reviewed.
- Ensure internet connection is secured and stable. Check on wireless routers, hot-spots, and passwords. Avoid additional network disruptions.
- Ensure daily coursework, announcements, and assignments have an efficient flow. Time management is a must for interaction with students.
• Ensure to constantly encourage virtual classroom morale. Use jokes, humor, etc. Prepare various fun slides, so students avoid the stress of listening.
• Ensure presentation slides are not overloaded. Keep information to the minimum. Don’t forget, it is a virtual platform, the student can research information within seconds.
• Ensure classroom assignments are on slides and shared step by step. It allows for better virtual classroom management.
• Ensure to record classes when necessary. Again, it is a lecturer’s choice.
• Ensure speech has pace and tone and creates confidence in communication.

To conclude, the impact of technology-mediated interaction on learning is substantial. Student-lecturer communications for effective classroom interactions are challenged while virtual wall exists and will continue to exist. Hence, universities should focus on altering their teams, goals, content, and offerings to the new reality.

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