

Article

Online and Hybrid Teaching and Learning: Enhance Effective Student Engagement and Experience

Kelum A. A. Gamage ^{1,*}, Achini Gamage ² and Shyama C. P. Dehideniya ³¹ Centre for Educational Development and Innovation, James Watt School of Engineering, University of Glasgow, Glasgow G12 8QQ, UK² Center for Communication Skill Development, Sri Lanka Technological Campus, Padukka 10500, Sri Lanka³ Department of Education, University of Peradeniya, Peradeniya 20400, Sri Lanka

* Correspondence: kelum.gamage@glasgow.ac.uk

Abstract: The COVID-19 pandemic has had an unprecedented impact on the global higher education system, where many universities have adapted to online and hybrid teaching and learning. They continue with some activities on campus, particularly laboratory-based teaching, but some content is delivered remotely. Significant adjustment to traditional face-to-face student engagement activities is crucial for the success of online and hybrid teaching and learning. This paper investigates the student engagement and experience in these environments. Engaged students are more likely to reach their full potential academically, and this paper identifies the areas for enhancement to student engagement activities. A survey was conducted (in Sri Lanka) to identify students' perceptions of engaging in activities during online and hybrid delivery. The results of the study illustrate a significant student engagement in learning whereas a pessimistic perception towards the transition to a completely online setting.

Keywords: online learning; hybrid learning; laboratory-based teaching; student engagement; student experience

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1. Introduction

In response to the unexpected outbreak of COVID-19, several precautions were taken worldwide. Among them, the transition from face-to-face conservative teaching learning methods to remote instruction through online and hybrid learning was a major leap that the education sector took. Traditional university structures centred on mass lectures and tutorials often foster such practices. The notion of conventional education has dramatically changed within the last couple of years, compounded by the changes in the nature of higher education: limited funding; increased student-to-staff ratios; and a shift in the profile of the student population to greater part-time enrolment [1] that increased the tendency for online learning. As a result, more ethnic minority and part-time students elect to take online courses instead of traditional classroom courses. Hence, it should be accepted that computers and the Internet have offered educational opportunities to many people who would otherwise be excluded from the traditional higher education system [2]. On the other hand, contemporary online learning technologies are having a significant influence on university education, and should thus be considered as an important aspect of course delivery in higher education today [3]. “The university education can be accessed at one’s convenience at your own pace via internet and World Wide Web” [4]. With the expansion of advanced technology and the idea of e-learning—a type of learning conducted digitally through electronic media typically involving the internet—the delivery of post-secondary education and its strategies and methodologies correspond with the norms of online and hybrid teaching and learning at present.

Apart from that, engagement in academia and interaction with peers and instructors are two crucial factors that impact the success of academics both in the virtual world and the physical classroom [5]. Trowler (2010) mentions that student engagement has become an important topic in academic literature since the mid-1990s [6]. The delivery of the coursework always depends on the learner's engagement. When the learner is not actively involved, it affects the entire learning and teaching process. The author of [3] highlights a number of reasons to explore the significance of understanding online and general student engagement based on several studies in the field. According to that, student engagement information measures, individuals' intrinsic involvement with their learning and assessing students' engagement in key educational processes provides an indirect measure of educational outcomes. Moreover, engagement data provide a direct measure of students' involvement in key educational processes while the engagement perspective can help focus considerations of the quality of university education on student learning. Not only do the student engagement measures cut across a number of conventional theoretical or bureaucratic distinctions to reflect the wide range of educationally meaningful interactions that students have with their universities via student engagement information, they also provide coincident measures of student learning activities that can be used to evaluate and manage the quality, nature, levels and targeting of resource provision.

However, student engagement and interaction in the online/hybrid learning settings have become two challenging phenomena faced by university academics. The shift to online teaching requires adaptation in teaching practices and in the ways in which modules are designed and assembled. The primary challenge is then changing established routines, practices and expectations that have developed among teachers and students [7]. As Bundick et al., (2014) emphasise, "The student disengagement in schools is widespread" [8]. With the transition to the synchronous and asynchronous delivery methods during the COVID-19 pandemic, the focus is deflected to the topic "student engagement/disengagement". Since the predominant traditional view is that the learners are actively engaged and more interactive with physical educational methods, a larger amount of people tend to question the engagement/disengagement in online learning environments, even though a substantial amount of information can be seen regarding student engagement in online learning settings.

Currently, the approaches that have been taken by the educational institutes can be divided between two main mode: synchronous/asynchronous delivery and blended delivery. Synchronous learning, or distance learning, is online, based on real-time interactions between students and learning facilitators or instructors, whereas asynchronous learning occurs through online platforms without real-time interactions [7].

The previous literature suggests that learner engagement can be enhanced through hybrid or blended course delivery which is one of the most efficacious approaches. There has been much discussion over the term "blended learning" in recent years and the general consensus is that blended learning is a combination of face-to-face learning experiences, such as on-campus classroom contact, and online learning experiences [6]. Ref. [9] defined blended learning as the combination of tools embedded within an e-learning environment or the combination of a number of pedagogic approaches irrespective of the technology used. Ref. [7] has predicted that most online higher educational experiences for the 2020–2021 academic years will be based on a hybrid learning model which is a combination of both online and physical classroom environments that blend synchronous with asynchronous online learning. In a hybrid-oriented classroom, it blends both the traditional and the online delivery methods effectively with learner-centric approaches, instructor intervention, and significant peer interaction and communication.

The abrupt and forced decision to shut down all the higher education institutions (HEI) due to the pandemic had a massive impact on the education sector worldwide. Putting forward their response to the COVID-19, developing countries (e.g., Sri Lanka) also made a significant transformation to online or/and hybrid delivery methods in higher

education after closing their educational institutes and opening their door to online education. Therefore, this study aims to:

- Investigate student engagement and experience in online and hybrid learning environments during the pandemic (during 2021).
- Identify areas for the enhancement of student engagement activities.
- Identify students' perceptions of engaging in activities during online and hybrid delivery.

The data obtained through a survey circulated among learners from different disciplines in HEI (in Sri Lanka) were analysed, focusing on the following key questions:

- How are academic success and achievements affected by learner engagement during the pandemic?
- What are the learner's academic experiences and attitudes toward the sudden transition and complete online learning?
- What areas are to be reconsidered when focusing on student engagement and academic success?

2. Background

The novel coronavirus, popularly called COVID-19, was declared a global public health emergency on 30 January 2020, and later as a pandemic on 11 March 2020 by The World Health Organization [10]. In view of the sudden spike in COVID-19 infections, immediate actions were taken by all the authorities globally to shut down schools, universities, and all other educational institutes to abide by all the COVID-19 health procedures and practices [11]. Later, educational institutions started to prepare for distance learning and teaching methods, postponing ongoing examinations and reorganising the existing structures of the education system until the COVID-19 situation subdued.

COVID-19 has created a plethora of issues in almost all divisions with its unpredictable nature and has affected both students and academics to a greater extent. Enduring emotional distress and fear make it extremely traumatic, particularly because of sudden drastic changes and the short time they had to adapt to said changes. Due to the potential risks to the psychological and physical health and wellbeing of individuals, it was mandatory to abide by all the strict health protocols while many of us are obligated to deal with a sense of isolation and loneliness. A substantial amount of evidence can be seen that demonstrates the severity of this concern since many people undergo a lot of aversive emotions such as uneasiness, fear stress, sadness, etc., because of the prevailing circumstances [12–14].

One of the major challenges faced by the education sector is the uncertainty about the best ways in which the prevailing situation can be addressed. Although the sudden transition to the complete online learning method is one of the major challenges faced by learners since the early 2000s, web-based applications have become the de facto standard platform for distance education courses and learning management systems [2]. The prior studies explore the costs and benefits of conducting course delivery complete online [15,16]. As the literature indicates, the learners show a positive attitude towards online learning while they enjoy the flexible schedule it creates [17]. Furthermore, an adequate number of studies show that the probability of students dropping out of educational institutes is high because of reasons such as attendance deficiency, course credit deficiency, and the poor academic and emotional support students receive from both loved ones and instructors [18,19]. On the other hand, the researchers show that typical disengaged learners, even in the physical setting, start missing and dropping out from the distance and remote learning process due to various reasons [20]. The United Nations proclaims that since new school / university attendees were forced to start largely with distance learning approaches [21,22], disconnected and underprivileged students faced the greatest challenge, lacking the connectivity and finances to engage, thus effectively ending their education. The most recent findings by numerous researchers demonstrate that many

marginalised students chose to drop out of their relevant educational institutes since they were not able to cope with the abrupt transition [23,24]. Another complication is that students struggle to engage, and since students are not distinguishable from each other due to their learning differences, some students tend to become discouraged and show a poor academic success rate [25,26].

In addition, since the learner is not directly communicating with the teacher, there is a completely different approach when it comes to course delivery in the online setting rather than conventional face-to-face education [27], since the instructor's course preparation and assistance activities have a different impact on the student's altered learning experience [28]. On the other hand, teachers adopted and discovered numerous techniques to engage and interact with students on online platforms, merging both asynchronous and synchronous modes of instruction. In the asynchronous learning method, the facilitator uploads the relevant pre-recorded lessons with additional materials such as PowerPoint slides, additional notes, and recommended articles for the learner, in which learning occurs through online platforms without real-time interactions. Conversely, the synchronous method is featured with online, or distance learning, which used video conferencing platforms such as Zoom, Hangouts, and Teams to deliver the course in real-time, ensuring the interactions between students and learning facilitators or instructors continued [7]. Hence, unlike the asynchronous approach, the synchronous method mostly relies on the facilitator with "a new and extended skill set" [29]. The consequences of the transition to online/hybrid platforms are quite challenging for facilitators, since learners' attendance is low and direct communication is rare, most probably due to the lack of experience of both parties [30]. The principles of online course delivery should be focused on student-centred methods [31] regardless of the mode—synchronous or asynchronous (Bryson and Andres, 2020). The academic tasks and activities completed in the online environment should promote peer collaboration and enhance student engagement to improve student learning and experience [32,33]. The teaching staff is also challenged by the prevailing situation, where one of the biggest challenges they encountered during this period is making their online/hybrid classrooms more effective, interactive, and engaging. The redesigning of the course/program is the key to incorporating discussion forums, quizzes, groups, feedback, etc., to support and encourage students to engage in their academic work [34]. The sudden transition to online and hybrid platforms has encouraged the teaching staff to discover new approaches, techniques, and methodologies to deliver their courses. However, many teaching staff had their struggles when adopting and finding the right method to deliver the content while maintaining student engagement and interaction [35]. Hence, most of the teachers were overwhelmed by the situation, not knowing how to adjust to the new normal. The previous studies significantly demonstrate that the unforeseen and sudden transition has made a huge difference in academia while showing both students and teachers a new facet of education.

Although student engagement has also been the focus of numerous scholarly studies, there is no one standard definition of student engagement. Most researchers have their own ideas towards student engagement based on their different emphasis on their research [28]. Further, as the most accepted concept of student engagement, it has many dimensions: behavioural, emotional, or cognitive. Ref. [2] highlights the outcomes of several researches and, according to that, most studies on the topic of technology and student engagement have affirmed the utility of computers and information technology in promoting student engagement. Specifically, earlier research has confirmed that asynchronous instructional technology allows learners more time to think critically and reflectively, which in turn stimulates higher-order thinking such as analysis, synthesis, judgment, and application of knowledge.

Thus, the current study primarily concentrates on student engagement during the transition period, that is, from the traditional teaching–learning setting to the online/hybrid instructional setting, while bringing out the perspectives and attitudes of both students and teachers through their own experiences.

3. Methodology

A non-experimental research design was employed for this study.

3.1. Sampling and Instrumentation

This study was conducted through a student survey and academic interviews. The survey was circulated among 135 learners and the return was 100. The participants were both undergraduates and postgraduates from the state (37% of the sample) and non-state (63%) higher education institutes in Sri Lanka.

The primary data were collected using the student survey while the secondary data were collected through academic interviews. The student survey questionnaire focused on the demographics of students and their engagement, experience, satisfaction, and perception of online learning/hybrid learning when they transitioned from face-to-face education to online and hybrid education. Student engagement was the key focus of the questionnaire, and other areas such as student experience, satisfaction, and perspectives were also investigated. The questionnaire was designed using Google Forms and consists of a Likert scale approach ranging from “Never” to “Very often” for the statements.

All the participants represent higher educational institutes, and they indicated the degree of agreement or disagreement on statements given in the questionnaire, which covers the numerous phases of student engagement and experience. Most importantly, the questionnaire encouraged student feedback and perception towards student engagement and transition in particular at the end. Prior to administering the questionnaire, a pilot test was conducted and the results were checked for reliability. As the alpha value satisfied the acceptable alpha value, the questionnaire was administered. Participation in the questionnaire was entirely voluntary and no explanations were provided regarding any of the questions. Furthermore, to obtain a comprehensive idea about the perceptions and experience of online and/or hybrid learning, a series of academic interviews were also conducted. Six academics were interviewed who represented different subject disciplines such as engineering, technology, business management and communication skills. The academic interviews helped assess how student engagement has an impact on the success of academic work done by learners.

The collected data were organised, tabulated, and analysed using both quantitative and qualitative approaches. For the quantitative analysis, IBM SPSS V26 was used and qualitative data was analysed thematically.

3.2. Demographic Features

In this study, the data were collected by both undergraduates and postgraduates from the state (37% of the sample) and non-state (63%) higher education institutions in Sri Lanka. The majority of the sample was represented by undergraduates, which is 93% of the participants, while 7% of the sample was postgraduates. In general, a substantial number of participants, 76%, indicated that they were not previously exposed to any kind of online learning method, whereas 24% reported that they had previous experience with online learning. Of the participants, 61% were men and the remainder were women. Figure 1 shows the demographic characteristics of the learners who participated in the study.

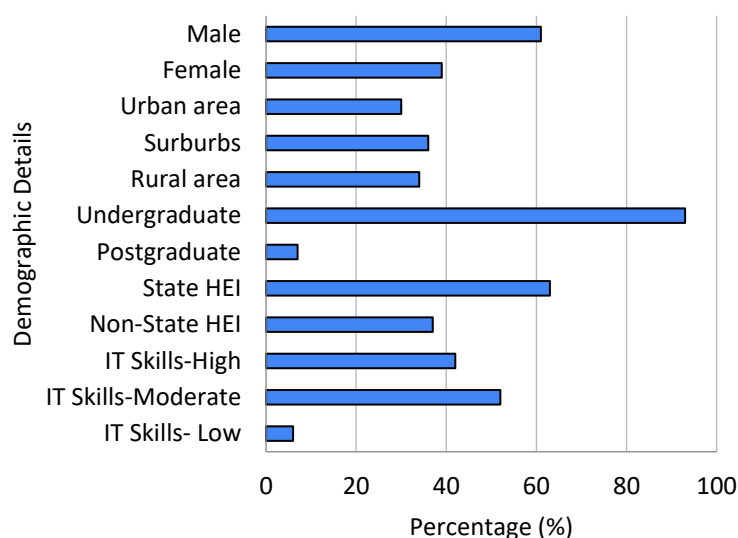


Figure 1. Demographic characteristics of participants who participated in the questionnaire.

Out of 100 participants, only 6% had a lower level of IT knowledge, whereas 42% and 52% had a higher level and moderate level of IT knowledge, respectively.

4. Results

Independent variables such as location, level of education, affiliation, and the devices used and the quality of the network can affect student engagement in learning (ordinal dependent variable) at different degrees. The ordinal regression method is used to model the relationship between the ordinal dependent variable (categorical variable with four ordered categories ranging from “Never” (1) to “Very often” (4)) and the independent variables concerning demographic factors such as the location, affiliation, and level of education. The collected data demonstrate that the majority of the respondents use their laptops to take their courses while a considerable percentage, nearly 71% (Table 1) experienced a good and stable network connection. However, a little over one-fourth of the sample, 26.3%, has experienced a poor network connection.

Table 1. Quality of the network depending on the learner location.

Location	Good and Stable	Poor	Grand Total
Rural area	9.1%	21.2%	33.3%
Suburbs	32.3%	4.0%	36.4%
Urban area	29.3%	1.0%	30.3%
Grand Total	70.7%	26.3%	100.0%

Students also stated the lack of communication with academics, the high demand for self-study, the quantity of the assignments, and online assessment methods as areas that discouraged and depressed their studies.

The results shown in Table 2 consider the location as the dependent variable and student engagement (online presentation) as the factor. According to the results, learners in rural areas, which is 34% of the sample, stated their engagement in online presentations as ‘Often’ or ‘Sometimes’, while this number is 36% for suburbs. The learners in urban areas engaged in the particular task often or sometimes, at 20% and 10%, respectively.

Table 2. Student engagement (making an online presentation) depending on the learner location.

Location	Often	Sometimes	Grand Total
Rural area	13.0%	20.0%	34.0%
Suburbs	29.0%	7.0%	36.0%
Urban area	20.0%	10.0%	30.0%
Grand Total	62.0%	37.0%	100.0%

Figure 2 shows the results of the dependent variable—the location—and the factors—student engagement (used e-library facilities, attended classes having read materials, engaged in academic online classes on Zoom/Goggle meet or any other platform, used emails and other forums for academic purposes.) According to the data, the majority of the students, irrespective of the location, have stated either the option “Sometimes” or “Often”, which made up around 60% and 30%, respectively, of the whole sample. Therefore, the above case processing summary depicts that the majority of the respondents have engaged in a substantial amount of online work during the pandemic. A minority also demonstrates a strong engagement in their studies (i.e., “Very Often” (4) category in the Likert Scale), which makes up around 5%–10% in each statement in the scale.

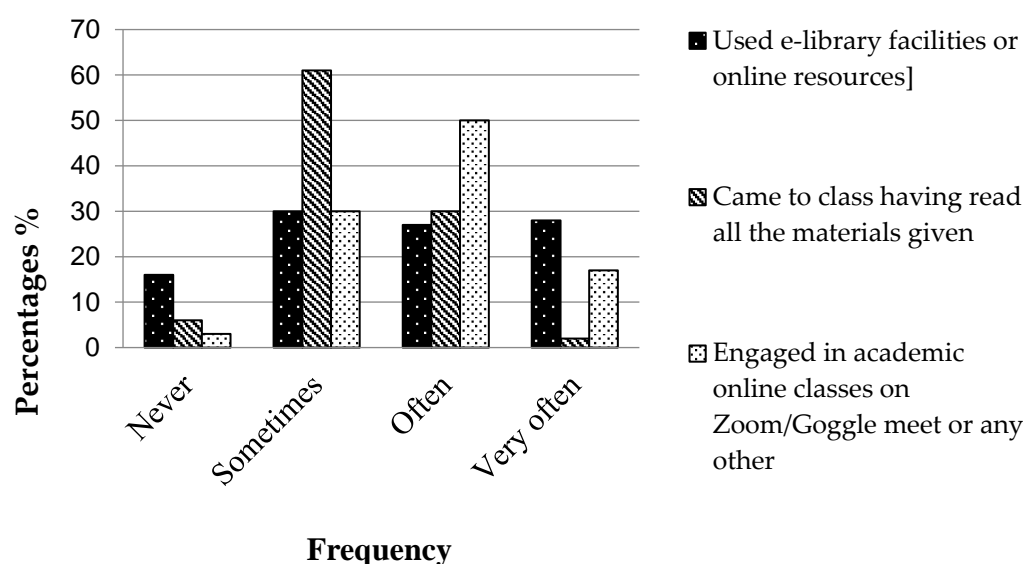
**Figure 2.** Student engagement in academics with teaching staff and peers.

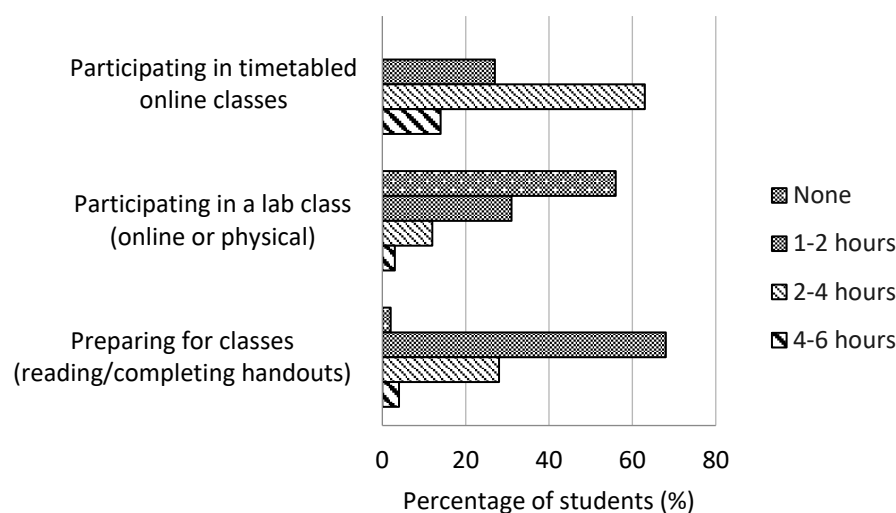
Figure 2 further reveals that 16% of the respondents have not used e-library facilities, whereas a significant number of learners have used e-library facilities. Numerically, 29% mentioned doing so sometimes, 27% often, and 28% very often. The above data also depict that student engagement in online classes is at a higher rate (Often = 50%, Sometimes = 30% and Very Often = 17%). The disengagement can be considered negligible at 3%. The data indicate that the majority of the learners (Often = 30%, Sometimes = 61%) have made an effort to prepare for their respective classes.

According to the data, student engagement (from both state HEI and non-state HEI) in online classes was recorded as “Often = 50%” or “Very Often = 17%” (see Table 3). Notably, the non-state HEI learners have shown a higher level of engagement in comparison to state HEI learners, as 63% of the student engagement is recorded from non-state HEI.

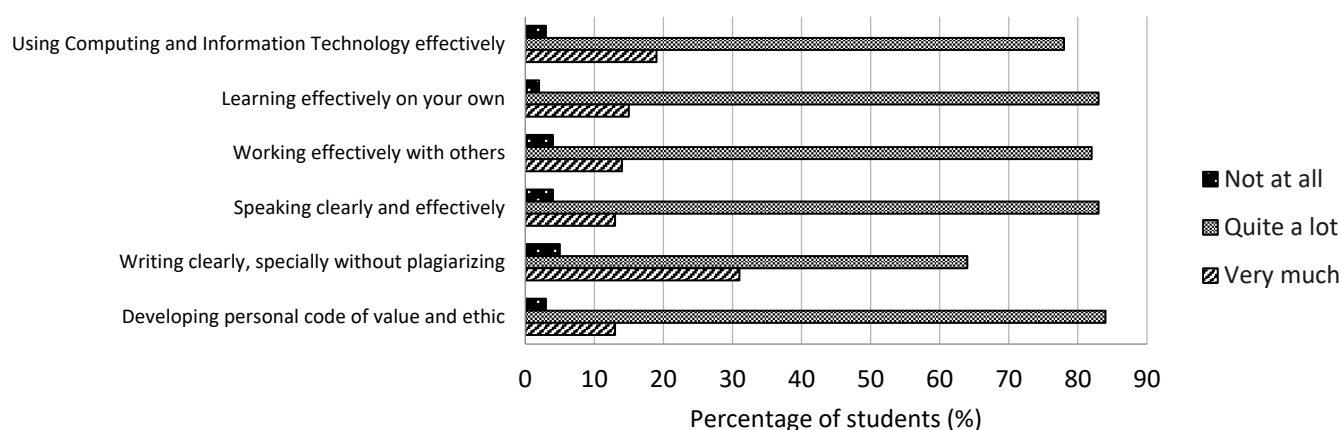
Table 3. Student engagement (making an online presentation) depending on the learner location.

Frequency	Used e-Library Facilities or Online Resources	Came to Class Having Read All the Materials Given	Engaged in Academic Online Classes on Zoom/Goggle Meet or Any Other
Never	16%	6%	3%
Sometimes	30%	61%	30%
Often	27%	30%	50%
Very often	28%	2%	17%

Figure 3 represents the data of the weekly engagement in studies. According to the data, the majority of the learners, which is approximately 60%, state that they have not engaged in a lab class at all. The data indicate that a larger number of learners (approximately 70%) spend at least 1–2 h preparing for their classes, whereas this figure is 2–4 h for online classes (approximately 60%).

**Figure 3.** Learners' weekly engagement in academic work: Non-state HEI/State HEI.

When the participants were asked; "to what extent has your experience at your institution contributed to your knowledge, skills, or personal development?", a greater number showed a positive attitude towards it. This is shown in Figure 4.

**Figure 4.** Contribution to Learner experience at their institution.

In the study, we noticed that the majority of learners (61%) have an interest in the hybrid method of learning, 28% of the participants are in favour of the traditional learning and teaching method, and 11% proclaim that they are in favour of online learning.

5. Discussion

Considering the above, it is evident that the learners and institutions have made a successful attempt at transitioning from conservative teaching and learning methods to virtual learning and teaching. In general, it is evident that student engagement in online learning during the pandemic is higher in the non-state sector. However, at the time of the questionnaire, even though the learners were receiving a substantial amount of synchronous and/or asynchronous education, they were still reluctant to engage in studies in a completely online environment, whereas they were comfortable in receiving the education in a hybrid manner. In contrast, the conservative perspective toward education has been gradually disappearing from the minds of young and adult learners equally.

Based on the research findings in [3], the author suggests that online learning management systems have the capacity to influence university education in many ways. For staff, these systems may influence the selection and development of basic online materials, affect traditional teaching practices, and introduce new dynamics into the management of teaching programs. Clearly, these systems have the capacity to influence university education in profound and perhaps unanticipated ways. In particular, for the current study, student engagement with academics during the pandemic via online platforms is optimal. Even though it seems their perception towards this is pessimistic, several drawbacks were highlighted. The students believe that complete online learning is only acceptable because of the uncertain time they are going through and, further, as a personal health safety measure. They also consider it as a new experience. Inversely, learners are concerned about the missing or uncompleted practical components of their courses. Students think that actual contact in real-time with peers and academic staff would give them more exposure and a less stressful university experience. Beyond this, the findings of [36] suggest that instructors also need to provide multiple ways of interacting with students themselves to create their own social presence, as it is an integral component of a successful online course.

Flexibility in the academic schedule, practicing to be responsible for one's own learning and maintaining self-discipline, facilitating self-learning, and availability of lecture records for future reference have been taken as the positive outcomes of the online learning experience. Additionally, online learning has been recognised as time-saving and as a way of developing time management skills. Notably, it has been seen as a way for learning how to communicate through an online platform for the future and a better means for postgraduates, since they can study while working. Conversely, one of the critical issues faced by students, as emerged through the discussion, was the shortcomings of telecommunication infrastructure, which resulted in an interrupted learning experience or total miss of lectures and examinations. This highlights the national requirement for the establishment and proper maintenance of digital communication facilities.

Due to the pandemic, many academics who teach in mainstream universities have been asked to adjust to online teaching in a matter of days throughout the world [37], which was challenging in many ways. In the event of an emergency remote transition, students' needs and challenges have likely changed, and instructors may want to take the time to familiarise themselves with their students' emerging concerns, questions, and situations [38]. According to the views of academic staff, students are drained at the end of the academic year. "The students I worked with always come to the class at the beginning of the semester, but after the mid-semester examination, the attendance is low". The results extracted from the interviews completed with academics depict the enthusiasm a learner has at the beginning of the course gradually diminishes. According to them, the number of attendees increasingly declines after the mid-semester, and towards the end, half of the class or more than that would be left behind. "When I put students into breakout rooms on Zoom, I can see that they do not speak with each other, also when they

are directed to the main session after the group work, a half of the class is missing". However, the results of [39] show that students gained significantly higher behavioural and cognitive engagement when teachers played a facilitation role during discussions. The academic also stated that even though individual student engagement can be seen, the lack of active and collaborative learning (which also includes not asking questions in the class, not responding to the questions, and not working as a group on a virtual platform) can be identified as a significant feature among learners. Both learners and academics were similarly concerned about the enrichment of the educational experience. Participation in learning communities, internships, research, and engagement in diversity within the learning community has been dramatically decreased among the university population.

In general, both learners and academic staff are in favour of the transition to online and hybrid platforms since they are effective and safe during the pandemic. Even though the abrupt transition has a lot of challenges and limitations, it has solved many problems; for instance, it has saved time and served the education process without leaving a permanent barrier in the future.

6. Conclusions and Recommendations

The results of this study further illustrate the significant impact of COVID-19 on student engagement in the HEI. In the comparison of state HEI learners and non-state HEI learners, student engagement in online learning is higher in the non-state sector during the pandemic, and is at a satisfactory level. The results display that the majority of students have accepted the synchronous and asynchronous learning methods during this confinement period. However, the student's perspective toward the transition cannot be identified as a positive perception. Significantly, student perception is a critical and essential factor in the success of their education and that cannot be disregarded. The lack of resources, lack of communication with relevant parties, self-discipline, network disruptions, stress, and lack of interaction is associated with the root cause of the fear and reluctance of students. As Weaver (2005) stated many factors can limit a learner's participation in online discussions such as time pressure, non-participation by others, and even fear of looking silly and a lack of confidence [40]. Ref. [37] pointed out, based on the research evidence, "what we have seen is that moving face-to-face teaching online is not e-learning but remote learning with some technology tools being made available, but without all the resources, methodologies and necessary training".

Both the cognitive and social presence of the instructor is important for the continued engagement of the students with the online content. Further, teachers' concern and involvement with the students have been seen to influence learners' intent to persist [40]. Hence, it is suggested that interpersonal connection and guidance should be increased in the online courses. On the other hand, research shows that students are mostly sufficiently skilled to take part in digital lessons, but the development of these lessons by teachers turns out to be a lot more difficult [41]. Hence, facilitators suggest that adopting the means and techniques of online education and providing training on the use of digital pedagogy for teachers and students would increase student engagement further. Both parties emphasise that moving to a hybrid method of learning and teaching would be a better decision, since the online platforms have drawbacks that are beyond human control.

Moreover, the quality of the course in terms of audio and video has to be good for the student to keep them engaged and reduce attrition. Students do enjoy interactive content, though it has not been directly related to increased learning outcomes [40]. However, the findings of this study concluded that both the learners and the academics were not prepared for a complete online learning method while they took a substantial amount of time to adjust to the sudden and rapid transition to remote learning and teaching. The learners (especially the learners in rural areas) were harshly affected by the disparities in accessing the internet, electronic devices, new learning environments, and mental health imbalances. Simultaneously, the faculty members were also exhausted due to the work-

life imbalance; especially being unable to separate their professional life from their personal one. In conclusion, it is evident that “access to education” should be largely addressed and prioritised, especially in developing countries since the disparity is more apparent due to COVID-19. HEI should ensure equal opportunity to access relevant courses while introducing effective strategies and techniques to make the courses and delivery learner-centered and interactive to increase student engagement.

Concisely, it can be concluded that even though there is an adequate degree of student engagement, students and teaching staff had not been in favour of online learning due to various socioeconomic and emotional reasons. It may be also concluded that online learning is a useful method for coursework delivery. On the other hand, the results of the study show that the lack of lab sessions has made learners lose a considerable amount of the important workload of their relevant courses. Therefore, going forward with the pandemic, if the above gap can be filled, a vivid and constant level student engagement in online teaching delivery can be maintained.

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