



Improve pre-service teachers' online learning attendance and accessibility through multiple platforms

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Abstract

In this paper, we report on the use of multiple platforms to circumvent challenges associated with non-attendance because of limited accessibility to conventional video conferencing digital tools such as Microsoft Teams (MS Teams) and Blackboard collaborate. One hundred and sixty-five participating pre-service teachers were given the autonomy to connect using any of the given platforms from a prescribed list that worked for them. The platforms' attendance tracking systems were used to gather data. The findings revealed that using multiple online platforms lowered the challenges associated with lack of access to high-end technological tools and resources. Most of the registered pre-service teachers attended an average 60% of the live classes and 50% of the students strongly agreed that they had followed the recorded sessions. Multiple platforms afford pre-service teachers a choice on what works better for them based on the technology to which they have access to and with which they are familiar.

Keywords: Synchronous, Asynchronous, online learning, multiple platforms, pre-service teacher

Introduction

The Covid-19 pandemic lockdown meant that traditional face-to-face (F2F) learning was no longer possible. Given the abruptness of the situation, teacher educators and pre-service teachers were not prepared for the transition to online learning. Just like many other educators, the teacher educators and pre-service teachers did not have enough online learning

platforms for effective emergency remote teaching and learning. In some cases where online teaching and learning resources were available, educators were unprepared to use digital technology for effective remote teaching and learning (Chigona & Chigona, 2013). This unpreparedness was illuminated during the lockdown during which the teacher educators and pre-service teachers were not able to incorporate online learning platforms for effective teaching and learning. Studies observed that teacher educators were using technology to substitute for F2F teaching strategies by uploading content with limited engagement (Marioni et al., 2020).

Nonetheless, the unprecedented shutdown forced institutions to improvise emergency remote learning interventions, such as providing data bundles and laptops to some needy pre-service teachers. Additionally, Internet Service Providers (ISPs) provided free access to data to educational sites and Learning Management Systems (LMS) platforms. All this was done to enable teaching and learning to continue during the lockdown. Despite these interventions, we noted with concern that the online class attendance was low, and pre-service teachers complained about problems with connectivity and the lack of appropriate devices such as laptops or desktops and high-end smartphones. In one course taught by the first author that had an enrolment of 160 pre-service teachers, the attendance record always showed between 50 and 60 attendees and, in most cases, these were the same students. This meant that over 50% of the pre-service teachers enrolled were unable to attend courses and/or access the course material and this, of course, affected their performance. Attendance is an important measure of educational quality and a predictor of student success (Jones, 2018). We realised that pre-service teachers had access to different technologies to access the course content and engage with fellow pre-service teachers. For instance, some students had mobile devices that were incompatible with Blackboard but worked well with MS Teams. This implies a disparity of access because of diverse socio-economic differences among pre-service teachers.

The purpose of the study is to illustrate how the use of multiple platforms enabled and increased pre-service teachers' online attendance. While there are many platforms available, the researchers choose to use a combination of conventional institutional driven and non-conventional social platform to cater for all students. The platforms used in this study provide attendance statistics, assessment scores and track students' engagement with content. The study will show which platforms the students were using and how they engaged the different platforms. The findings of the study could help educational institutions to implement policies that are more sensitive to the impact that socio-economic backgrounds have on access to online learning. These policies would facilitate a balance of both conventional and non-conventional online platforms to enhance an inclusive online learning environment.

Study question

How can the use of multiple platforms increase students' online learning attendance?

Online learning design

Online learning is defined as learning that uses electronic devices with internet access (Susilawati & Supriyatno, 2020). It is referred to as e-learning or virtual learning among other terms. Online learning happens across physical distance; it is not carried out in a traditional classroom setup.

In this study, we explored two types of online learning, synchronous and asynchronous. Synchronous online learning, on the one hand, requires an educator and enrolled students to connect in real time and interact simultaneously, despite the physical distance (Khafaga, 2021; Murphy et al., 2020). On the other hand, in asynchronous online learning, educators provide content and assignments via an online platform and give a timeframe for the completion of activities and for assessment to be given (Watts, 2016). In this case, learning does not take place in real time; students may complete the activities in their own time within the given timeframe.

The Covid-19 pandemic disruption entailed physical separation, hence both synchronous and asynchronous approaches were employed in this study. The main concern was to create an inclusive online learning environment that took into account factors such as students' home environment, issues to do with their devices, accessibility, and connectivity, to name just a few.

Universal design for learning

The study's design of online learning followed the principles of the Universal Design for Learning (UDL) framework designed to create inclusive learning (CAST, 2011). The goal of UDL is to use a variety of strategies to reduce impediments to learning by providing all students with an equal opportunity to access learning resources (CAST, 2011). The UDL framework is about accessibility that incorporates and takes account of what is at the disposal of the students, their strengths, and their needs.

According to UDL, first, learning should be offered and represented in more than one format (CAST, 2011). In the case of this study, using multiple platforms afforded all students multiple options from which to choose based on what was easily available to them. Second, UDL suggests giving students more than one way to interact with the learning resources (Johnson-Harris, 2014; Xie & Rice, 2020). Using multiple platforms gives students various ways in which to interact with content and other knowledge sources, including their colleagues. Finally, UDL encourages educators to create platforms that motivate students' engagement with content (Xie & Rice, 2020), thus increasing online class attendance and encouraging the students to take part actively in knowledge acquisition.

Online learning platforms

Online learning platforms refer to web-based applications that take place over the internet (Yamagata-Lynch et al., 2015). The strength of online learning platforms lies in the fact that teaching and learning can take place anytime and anywhere.

Live streaming across platforms

Streaming across platforms in this study refers to broadcasting simultaneously to more than one platform. Streaming to multiple platforms ensures that one reaches a larger audience (Vryzas et al., 2020). In this study, we did not use a streaming application, but, rather, used what was available to us within our knowledge capability. They shared the computer sound that the students could hear while they were connected through the various platforms and devices available to them. We explored how we could stream the virtual class session across platforms accessible to all students. We logged into WhatsApp desktop, Blackboard collaborate, MS Teams, and the online radio.

The move to online virtual conferencing is hailed as a positive step for continuity in learning (Murphy et al., 2020). However, this does not guarantee that every student can attend because of other contributing factors such as a lack of access to resources and the know-how necessary to use these resources. Researchers have raised concerns about access barriers to some students and communities (Dinc, 2019). Making multiple connection points help to overcome these challenges.

Features for online learning platforms used in the study

We discuss the features of each platform used in this study comparatively. It is important to understand the diverse affordances each platform offers, what kind of learner each supports, and how accessible each is to students.

Blackboard is the learning management system the institution under study uses to track attendance. However, the attendance is captured manually within the system and is displayed and analysed. Blackboard has an added mobile device support that has made it even more usable, considering that many students have access to this technology off campus. This implies that given enough data and bandwidth, all students could easily attend live class sessions. The Blackboard Collaborate function provides a video conference facility that allows students to attend live sessions using video and audio. It also has a chat section in which students can exchange knowledge or resources and consult with others in real time.

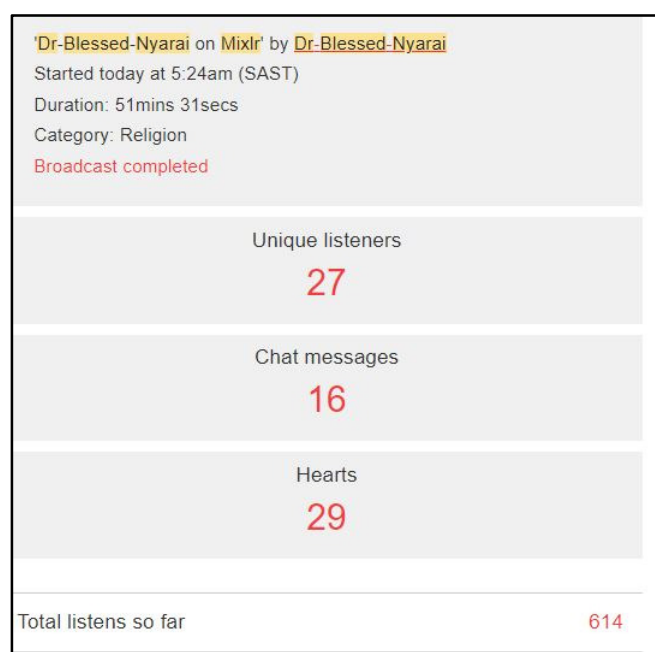
MS Teams is part of the Microsoft Office 365 suite and every registered student can easily install the application on their devices (laptop, desktop and/or mobile smart phone). The students can use their registration credentials to access MS Teams. This platform has features such as video and audio facilities, a chat function in which educators and students can engage with each other in real time. MS Teams also allows for files and documents to be shared among users and this includes live documents to allow for collaborative work. In terms of

attendance reporting, the platform provides several tracking statistics. During the live session, participants can see the number of people who are in attendance. It provides a list of all invitees in attendance as well as a list of non-attendees. At the end of the session, an excel file detailing who has attended, the relevant time, and when they left the class is generated and sent to the meeting organiser. Furthermore, there is the actual attendance feature that can be used manually. In this study, we used all these features.

The Mixlr platform is an internet-based radio that allows content creators to broadcast live audio in real time. A broadcaster will share their link with the targeted audience so that others can follow the broadcast. Followers receive a message whenever a broadcast starts. It provides on-the-go statistics on who is attending. When students download the App and register, they will start following certain programmes for which they get notifications once a session has been launched. For this study, we used the “Dr Blessed Nyarai’s” radio channel. Whenever a show or a live class session began, a message was sent to students who would be following the radio channel. Unlike the platforms discussed above, this platform offered only audio access. However, the advantage of this platform was that it was easily accessible to students via multiple devices and required very little data to run.

Figure 1

Mixlr attendance tracking system results



After every broadcast an attendance register is sent on email (Figure 1). Mixlr has a chat section that allows students to engage with educators and other students using text messages. In turn, the educator can read the questions or comments out loud to share with others on other platforms. Students connected on Mixlr receive sound that comes from the educator's computer system speaker.

Figure 2

Mixlr controls, showing only speakers are on

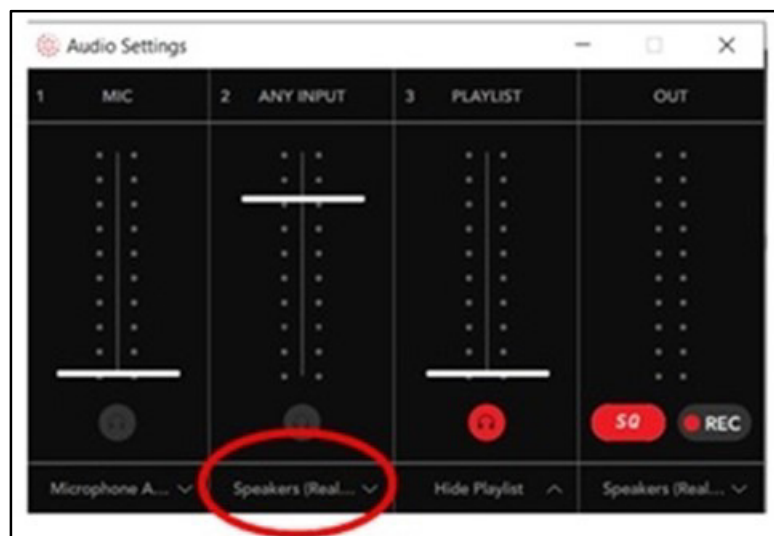
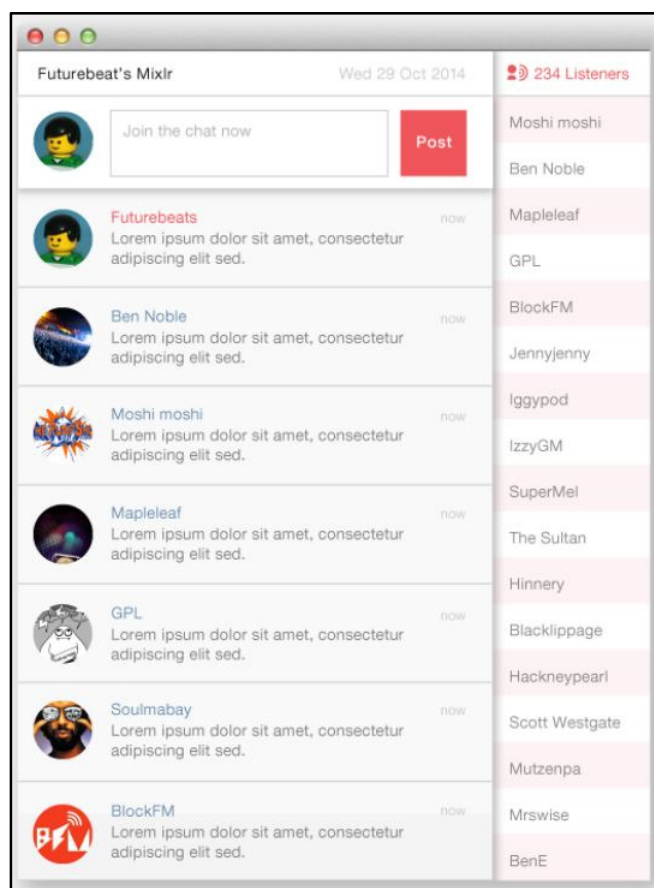


Figure 3

Mixlr chat window



Figures 1 and 2 shows that the Mixlr controls can be set to use broadcasting computer speakers, just like Blackboard and MS Teams or any other virtual conference platform.

The WhatsApp platform is a widely used platform that can be accessed on mobile smart phones, laptops, and desktops. The platform complemented the other three platforms, in that students were constantly on WhatsApp and could easily and quickly get connected on-the-go. Class representatives managed the class groups and had set times to open the platform to non-administrators so they could post messages, and this helped to filter unnecessary communications. In this regard, only communications pertaining to the course were allowed. Reminders, announcements, and links to the other platforms were shared in the WhatsApp group in time for people to join class sessions.

As indicated above, the affordances of each of the platforms and what they offered, helped increase inclusiveness by using multiple platforms during the online learning.

Methodology

We explored the use of synchronous and asynchronous multiple platforms during the lockdown for online teaching and learning and its effect on student inclusiveness. We used a combination of descriptive quantitative analysis to enhance data accuracy through meticulous statistical analysis. Descriptive studies are used to document the phenomenon of interest in the real situation. This means that the case's reality is studied and interpreted within its social context (Yin, 2013). This afforded us an in-depth understanding of how the different platform engagements can be employed to enhance inclusiveness and accessibility in digitally enhanced learning.

Sampling method and size

The study invited all 160, 3rd year enrolled Professional Studies pre-service teachers who were taking the Information Communication Technologies (ICTs) in Education course. The pre-service teachers, 160 of them, were conveniently selected from a teacher training institution to participate in using this intervention that involved many platforms. The participating pre-service teachers were destined to teach at the intermediate phase. For pre-service teachers to be part of a group they had to be enrolled in the course and were given access to the platforms either by a shared link or by default of being enrolled into the Professional studies module. However, for WhatsApp and Radio, links inviting them to join were shared on Blackboard and MS Teams platforms and the class representatives also shared in their other social networks. All 160 students were registered in the Professional studies course and all consented to be part of the research.

Data collection

Data was collected using online surveys and the platform-generated internal tracking systems embedded into each of the three platforms, Blackboard, MS Teams, and Mixlr radio. A Google form survey link was shared with all 3rd year intermediate Professional Studies pre-service teachers. The data collection lasted for seven weeks, and participants were reminded to complete the survey during online sessions or platforms channels.

Upon clicking on the shared link, participants had to read the informed consent page before proceeding and they had to indicate Yes or No to participate in the study by ticking either box. If the participant selected the No option, the system automatically exited from the survey. If the participant indicated Yes, this was taken as a signature acknowledging their consent. The participating pre-service teachers responded to questions on a Likert scale from 1 to 5 with 1 representing “Strongly Disagree” and 5 representing “Strongly Agree.” This Likert scale was designed specifically for this research project.

Data analysis

To understand the usage of multiple platforms, an Excel package was used to capture and analyse data generated from the platforms’ track history to produce frequencies and observe relationships between variables. Descriptive statistics was used as the method for data analysis. Descriptive statistics allows an effective strategy to summarise and organise descriptive statistical observations (Yebowaah, 2017). We familiarised ourselves with the data to recognise patterns (see Hollweck, 2016). We used trace analysis to gain insights into participants’ use of the different virtual platforms. We captured the data in a worksheet and frequencies and graphs were used to interpret the findings. Data was presented in tables and graphs and by deductively interpreting and presenting observations.

Ethical considerations

We observed the ethical norms by obtaining faculty ethical clearance. Consent to take part in the study was obtained from each of the pre-service teacher participants. To protect the integrity of participants, pseudocodes were used to ensure anonymity. No identity information was collected from any of the platforms nor from the Google survey used. To increase the credibility of data collection, the cleaned data was shared with the students.

Findings and discussion

The purpose of the study was to illustrate how the use of multiple platforms enabled and increased pre-service teachers’ online attendance. Therefore, inclusively reaching out to most of the pre-service teachers by using the technologies they had thus increased their online course attendance. As indicated earlier, each platform has a way of providing an inbuilt attendance monitoring tracking system and the findings are an analysis of these platform tracking systems. At the end of the course, we recorded the weekly reports from the platform's tracking systems and analysed them together with the feedback we received from the evaluation survey.

Pre-survey and post-survey

As highlighted earlier the pre- and post-surveys were used to explore students’ variability in terms of their access to digital technologies and applications and, finally, their experience on the different platforms suggested for use in this course. The survey responses revealed that the wide range of devices was randomly distributed; for example, some students indicated

access to low-end mobile phone. Remarkably, 100% of the participants indicated that they had access to the social media platform WhatsApp at all times while 54% had access to Teams and 58% had access to both Teams and Blackboard respectively. Access to other platforms was mentioned by 9%. All 165 had access to a mobile device, 35% had access to laptops, and 9% had access to desktop computers.

Figure 4

Devices used to access online classes

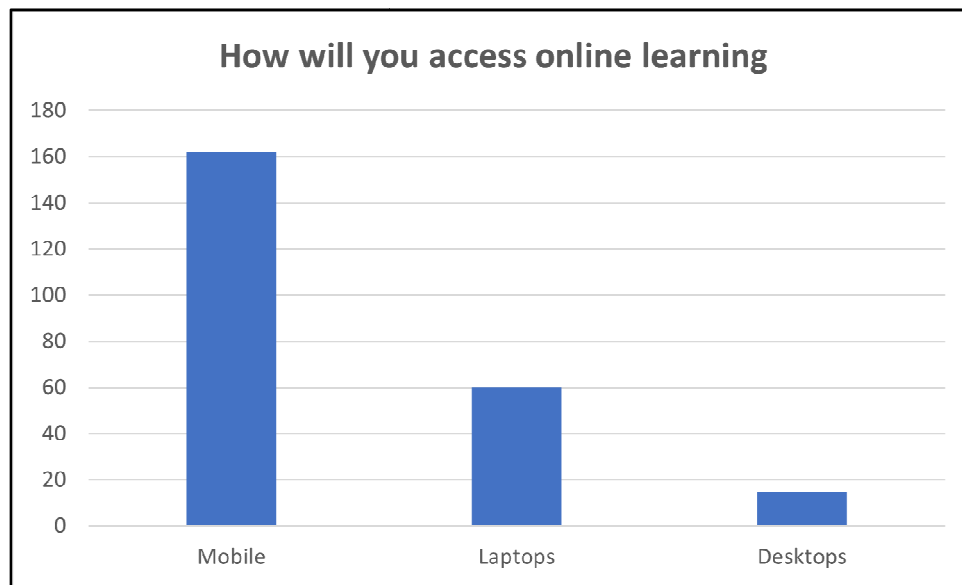
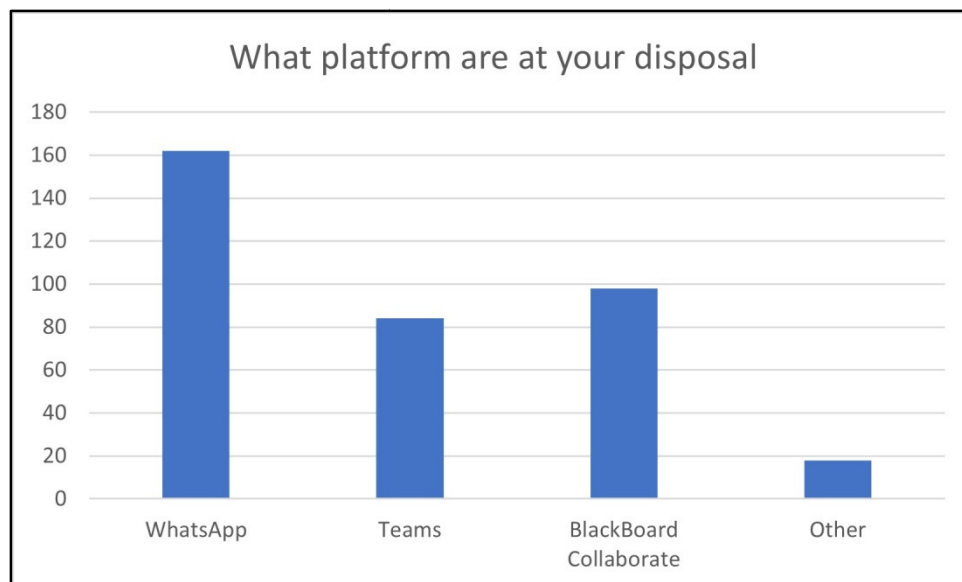


Figure 5

Platforms available to students



Figures 4 and 5 show the types of digital technological tools for remote learning to which students had access. After we discovered to which devices and platforms that students had access, we explored technological affordance by linking different devices synchronously. For

example, a greater number of students had access to mobile phones and this implied, of course, that mobile-mediated platforms would work better.

Platform session attendance tracking

After every session Mixlr would send a numerical summary of tracked statistics per broadcast and MS Team would provide a text file with a summary of who attended and time at which they logged in and or out. Blackboard has an inbuilt attendance link that allows the educator to capture attendance manually or students could record their own attendance. On Blackboard Collaborate, the number of logged in participants is also displayed in real time. WhatsApp was not included because it was used to complement the live platforms, and it does not have a tracking system. It was used mainly for interaction and for easily sharing notes and other resources. High volumes of interactions revealed active participation of the 160 pre-service teachers as follow-up on online class lecture presentations. Therefore, WhatsApp became a medium for unlimited engagements.

Figure 6
Attendance by Platform

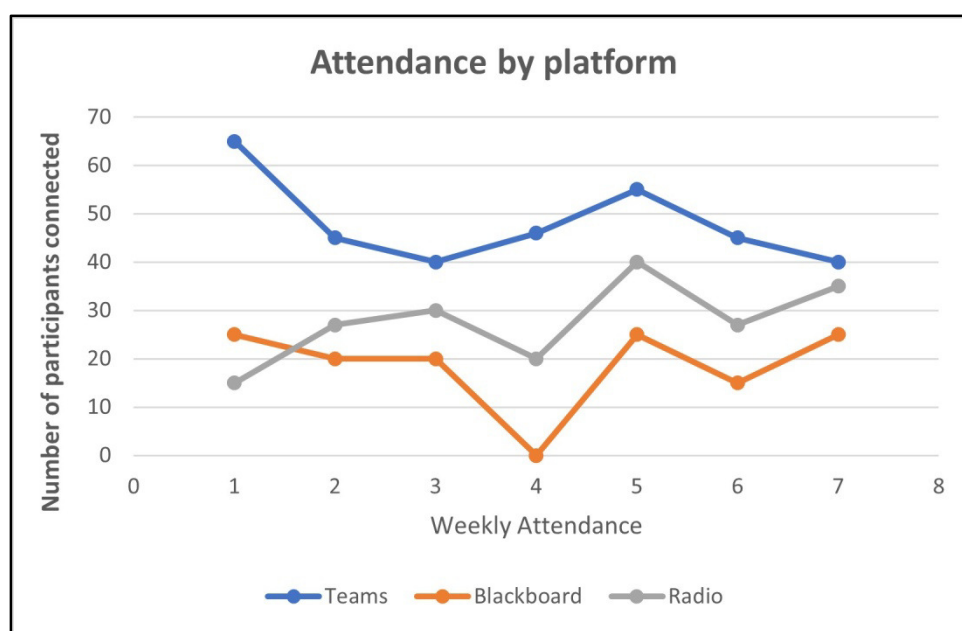


Figure 6 gives a summary of attendance by platform over the 7-week period of the study.

The Mixlr radio platform started slowly and later grew exponentially to a high of 40 connected devices and a low of 15. This was not a popular platform at the beginning of the study because of students' unfamiliarity with online radio platforms. It is important, therefore, for educators to continue exploring connecting options for students, especially when necessary to meet their socio-economic circumstances.

The Blackboard started with 25 devices and maintained a downward trend; by week 4, no device was connected to the platform because of institutional technical challenges. Interestingly, we observed that there were students who depended only on Blackboard to access online learning. This could have been the few students who remained in students'

residences during lockdown and could access the Blackboard using the institution's computer laboratories. This shows that infrastructure challenges are a contributing factor to the use of online platforms. These findings showed that students moved away from platforms that presented technical challenges in favour of ones that provided reliable connectivity. MS teams maintained a high device connection of more than 25 devices connected.

The table below summarises the attendance statistics for each platform during the period of research.

Table1

Attendance statistics for each platform during the research 7-week duration

Week	MS Teams	Blackboard	Radio	Totals across platforms
Week 1	65	25	15	105
Week 2	45	20	27	92
Week 3	40	20	30	90
Week 4	46	0	20	66
Week 5	55	25	40	120
Week 6	45	15	27	87
Week 7	40	25	35	100
Platform Total	336	130	194	
Average				94.28571

The findings show that using multiple platforms increased the number of attendances as illustrated by the table above. The table shows an average of 94 students' attendance (59%, an improvement over the previous 37% attendance pre-research), with a maximum of 120 in week 5 and a minimum of 66 in week 4 following technical challenges at the hosting institution. Week 1 to week 7 showed an improvement in attendance apart from week 4 that was affected by Blackboard downtime.

Of all the platforms MS Teams seems to have attracted more students. We assume that this could be because MS Teams was the least affected by technical challenges in having no downtime. It is also possible that students gravitated towards this platform since it was the platform of preference for the educator (see Oleson & Hora, 2014). Interesting observation is that the downtime of blackboard in week 4, may have caused the students to migrate to the next best platform in terms of availability as evidenced by the increase in attendance via Mixlr. This finding implies that connectivity is a contributing factor in choosing platforms to connect from.

Conclusion and recommendation

The purpose of the study was to illustrate how the use of multiple platforms enabled and increased pre-service teachers' online attendance. This study helped to determine the applicability of using different platforms for inclusivity purposes. As results showed, using multiple platforms increased students' virtual class participation from 37% on average per session to 94%. It is crucial to observe that the Covid-19 pandemic lockdown highlighted the need for the inclusion of students from different socio-economic backgrounds in the digital online learning environments. This inclusiveness can be achieved by using multiple online platforms. This is in line with the research in the field of educational technology that shows that students use social media for social interaction and believe that greater use of such technologies in academic contexts would lead to increased participation and engagement (June et al., 2014). Streaming across platforms is used in social sectors, so using them for teaching and learning could ensure that no students would be left behind.

It is therefore recommended that educators should use many different platforms for online learning to accommodate all students despite the type of technology to which they may have access and those they are comfortable to use for remote learning. This, as evidenced in this research, improved student participation and engagement. The use of multiple platform strategies should be explored further using streaming applications, entailing educators' need to be innovative, since this promises to reduce the digital divide caused by varying socio-economic circumstances and to increase inclusiveness.

It is further recommended that teacher educators are adequately equipped to teach effectively using the available affordable digital technologies that are accessible to marginalised student communities. In so doing, teacher educators would provide the pre-service teachers with a model of teaching that uses many different platforms that thus ensures that no learner is left behind.

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