From Contact to Online Learning in a Crisis: An Initial Investigation of Auditing Students' Online Behaviour Patterns

Zakiyyah Varachia, Dannielle Cerbone and Talya Segal

Abstract

The COVID-19 pandemic caused an abrupt change to the education system as most South African universities were forced to halt all face-to-face teaching and learning activities and shift to an online curriculum. This study aimed to provide an initial overview of the online behaviour of second-year South African Auditing students. Using reports from the Learning Management System, it investigated the time taken by students to access online resources, the type of resources accessed and if this behaviour had an association with students' marks. The analysis revealed that, on average, only 23% of the resources provided were accessed and also provided evidence that students did not access resources promptly. On average it took them 130 days after initial upload to access the online material. Students took longer to access tutorial videos (234 days) than other resources such as lecture videos (89 days). Significant, negative associations were established between student marks, time to access resources, and the percentage of resources accessed. This implies that, while face-to-face and online learning may be substituted for each other in an ordinarily contact university, the efficacy of online resources is dependent on the student's online behaviour.

Keywords: COVID-19, online learning, self-regulation, time management, higher education

Résumé

La pandémie de COVID-19 a provoqué un changement brutal dans le système éducatif, la plupart des universités sud-africaines ayant été contraintes d'interrompre toutes les activités d'enseignement et d'apprentissage en face à face et de passer à un programme d'études en ligne. Cette étude visait à fournir un premier aperçu du comportement en ligne des étudiants sud-africains de deuxième année en audit. En utilisant les rapports du système de gestion de l'apprentissage, elle a examiné le temps pris par les étudiants pour accéder aux ressources en ligne, le type de ressources consultées et si ce comportement avait un lien avec les notes obtenues par les étudiants. L'analyse a révélé qu'en moyenne, seuls 23 % des ressources fournies étaient consultées et a également prouvé que les étudiants n'accédaient pas rapidement aux ressources. En moyenne, il leur a fallu 130 jours après le téléchargement initial pour accéder au matériel en ligne. Les étudiants ont mis plus de temps à accéder aux vidéos des didacticiels (234 jours) qu'à d'autres ressources telles que les vidéos de cours (89 jours). Des associations négatives significatives ont été établies entre les notes des étudiants, le temps d'accès aux ressources et le pourcentage de ressources consultées. Cela signifie que, bien que l'apprentissage en face à face et en ligne puisse se substituer l'un à l'autre même dans une université où les contacts sont normaux, l'efficacité des ressources en ligne dépend du comportement en ligne de l'étudiant.

Mots clés : COVID-19, apprentissage en ligne, autorégulation, gestion du temps, enseignement supérieur

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Introduction

The coronavirus (COVID-19) outbreak across the globe significantly disrupted life in 2020 (de Villiers et al., 2020; Gonzalez et al., 2020; Rapanta et al., 2020). The education sector was not spared andmost South African universities were forced to move from face-to-face teaching and implement an online alternative (Gonzalez et al., 2020). The pandemic is not the first disruption experienced by the country's universities which were previously impacted by the *#FeesMustFall* protest which began in October 2015 and halted university activities (Mpungose, 2020b; Wangenge-Ouma and Kupe, 2020). However, unlike previous disruptions, COVID-19 resulted in a national lockdown that prevented physical contact and ordinary university activities for an extended period (de Villiers et al., 2020; Wangenge-Ouma and Kupe, 2020). In this context, universities were forced into emergency

remote learning to ensure that the academic year could be completed (Wangenge-Ouma and Kupe, 2020). The change to online learning was implemented on an urgent, unplanned basis without any transition or 'easing in' period which usually accompanies major educational change (Gonzalez et al., 2020; Mishra et al., 2020). Only one South African university is dedicated to distance learning, with all others dependent on face-to-face teaching (Mpungose, 2020b; Wangenge-Ouma and Kupe, 2020). At the University of the Witwatersrand, face-to-face contact was suspended from 16 March 2020 and by 20April 2020 online learning was used to deliver the remainder of the academic programme.

Online education is a relatively new concept (Zimmerman, 2000) with most research on this mode of teaching and learning being theoretical (Peters, 1999). It is gaining momentum at the global level, due to the higher costs associated with traditional teaching and learning (Çakýroglu, 2014; Queiros and de Villiers, 2016). Other advantages include its cost-effectiveness, convenience, accessibility and flexibility (Pollard and Hillage, 2001; Rodriguez et al., 2008). Online learning is often referred to as digital learning, remote learning, or e-learning (Moore et al., 2011; Mayer, 2019; Mpungose, 2020b) and can be broadly defined as non-face-to-face learning (Mpungose, 2020b; Mpungose, 2020a). Teaching material and instructions are delivered via the Internet on a device and the learning process is not dependent on the student's physical location (Clark and Mayer, 2016; Singh and Thurman, 2019). According to Ally (2004), online learning extends beyond using the Internet to deliver teaching material; it is also about the learner and the learning process.

Students who are successful online learners are self-directed, self-determined, self-motivated, self-regulated, and display self-efficacy (Dabbagh, 2007; Cunningham, 2010; Hong et al., 2011; Lehmann et al., 2014; Stephen et al., 2020). A lack of motivation, regulation, or self-discipline renders success unlikely (Cunningham, 2010; Hong et al., 2011; Stephen et al., 2020). Self-regulation specifically concerns the online student and his/her ability to control his/her own learning (Lynch and Dembo, 2004; Moore et al., 2011). It has different attributes such as goal orientation, self-efficacy for learning and performance, time management, help-seeking, and Internet competency(Lynch and Dembo, 2004).

The change from face-to-face to online learning was sudden, unexpected and rapid for lecturers and students and required a change in behaviour both in terms of teaching methods and students' approaches to studying (Mpungose, 2020b; Wangenge-Ouma and Kupe, 2020). As this was the first time that online learning was fully used for the traditional face-to-face accounting degree at the University of the Witwatersrand, the researchers sought to gain an initial view of students' online behaviour. Using information obtained from the Learning Management System (LMS) reports, the areas investigated were the type of resources accessed, the extent of resources accessed, and the time taken to access them. The study aimed to provide researchers in South Africa with initial findings in a local context to understand how the country's university students responded to online learning. It also aimed to provide lecturers at tertiary institutions with information regarding students' behaviour in an online environment which may assist in the design of future courses.

The article begins with a review of the literature related to online learning, self-regulation, and time management. This is followed by the background to the research and the methodology employed to conduct the study. Lastly, the results, implications and suggestions for further research are presented.

Literature Review

Online learning

The key elements of online learning include that there is physical distance between the lecturer and student, the use of the Internet and students' use of a device to access learning material (Ally, 2004; Gonzalez and St Louis, 2008; Clark and Mayer, 2016; Singh and Thurman, 2019). Mayer (2019) divides online learning into three components, namely, the 'what', the 'how' and the 'why'. The 'what' relates to the teaching material which can be verbal and/or visual such as pictures, diagrams, or videos (Mayer, 2019). The 'how' is the medium used for online learning and refers to electronic devices such as laptops, desktops, tablets or mobile devices (Mayer, 2019). Lastly, the 'why' relates to the reason for online learning, which is to impart knowledge to students (Mayer, 2019).

Online learning can be synchronous or asynchronous or a

combination of the two (Shahabadi and Uplane, 2015). Asynchronous learning occurs where there is a time delay in the delivery of resources such as pre-recorded lectures or communication is via email or forums, enabling students to plan according to their requirements (Gonzalez and St Louis, 2008; Shahabadi and Uplane, 2015). Online learning can also occur in real-time (synchronous learning), for instance, via Skype, Microsoft Teams, or live chats where there is live interaction between lecturers and students (Gonzalez and St Louis, 2008; Dhawan, 2020). Synchronous learning is more aligned to traditional learning as there is real-time contact between students and lecturers even though it is virtual (Aliyyah et al., 2020). Given that students face different obstacles such as limited Internet connectivity and poor access to devices, asynchronous learning was the best approach to online learning during the unexpected switch (Bharuthram and Kies, 2013; Queiros and de Villiers, 2016).

A weekly schedule was provided to assist students with better planning. The weekly planner included the lecture topic, the tutorials that would be covered for the week and a list of the tasks students were required to complete for the module. Tutorials are regarded as active learning as students engage in meaningful tasks because they have ownership of the content (McGown et al., 1996). Previous research has found that regular attendance at tutorials has a positive impact on examination results (Hutcheson and Tse, 2006; Horn and Jansen, 2009). Kirby and McElroy (2003) found that tutorial attendance has a greater impact on grades than lecture attendance. It has also been found that students who attend both tutorials and lectures benefit less than those who only attend one of the two (Horn and Jansen, 2009). With the change to online learning, no live lectures or tutorials could be held, and all learning occurred online with lecture and tutorial content recorded and uploaded for students (asynchronous learning). An advantage of this is that students can pause the video, rewind and re-watch content to gain a better understanding (Hughes, 2009). Videos have also been found to be beneficial to learning as multiple senses are used through viewing images, reading text and listening to content (Robertson and Flowers, 2020).

Although online learning has advantages, appropriate resources and commitment are required for it to succeed (Rossett, 2002). Ali and Leeds (2009) found that the drop-out rates for online courses were much higher than for traditional face-to-face learning. This is largely

attributed to a lack of self-regulation (Lee and Choi, 2011) and personal reasons cited by students (Nichols, 2010).

Self-regulation and Online Learning

Given the COVID- 19 pandemic and the move to online learning, the concept of self-regulation has become a key concept (Gonzalez et al., 2020). Students have had to adjust their environment and behaviour to become self-regulated (Zimmerman, 2000; Gonzalez et al., 2020). Self-regulated learning is defined as the extent to which learners are meta-cognitively, motivationally, and behaviourally active in achieving their learning outcomes (Peters, 1999; Zimmerman, 2000; Jung, 2001). It is a critical factor in online academic success; given the physical absence of a lecturer, online learning gives students more control overlearning material than traditional learning (Jung, 2001; Garrison, 2003; Dabbagh, 2007). It should be noted that overall educational practices are moving from teacher-centred to learner-centred practices which require self-regulation (Shahabadi and Uplane, 2015; Delen and Liew, 2016). Students who exhibit self-regulation traits focus on their learning strategies, engage in goal setting and complete tasks with fewer distractions (Zimmerman, 2000). They seek assistance as and when they need it, control important parts of their environment to ensure that their learning environment is conducive to learning and are active participants in their learning (Pintrich, 2000; Zimmerman, 2000). In a traditional face-to-face lecture, it is easier for lecturers to monitor students' understanding (Song and Hill, 2007). In an online setting, particularly with asynchronous learning, the student has to be self-regulated as he/she is responsible for his/her own learning and if issues are experienced the student is required to seek the necessary help (Song and Hill, 2007).

Students who dropout of online learning lack self-regulation traits as they underestimate the time required to complete tasks, display a lack of coping strategies and do not show commitment to goals (Artino, 2008; Cho and Jonassen, 2009). Self-efficacy refers to a student's belief that he/she can achieve something (Alqurashi, 2016). A student who lacks self-efficacy will not make an effort to complete tasks, will avoid obstacles and omit difficult tasks (Alqurashi, 2016). Goal orientation also impacts students' success in terms of online learning (Lynch and Dembo, 2004). Studies have shown that students who adopt performance-based goals

have higher levels of achievement in online learning (Zimmerman, 2000; Wang and Newlin, 2002). Students' experience of the Internet and the use of computers is also a key element for online learning success (Schrum and Hong, 2002). Those with superiorInternet competency have been found to be more goal-orientated than students with lower levels of Internet competency(Schrum, 1998; Zhang et al., 2001). Insufficient time management has been cited as a major reason for students failing online courses (Michinov et al., 2011; Yang et al., 2020). It is important to note that within the South African context, there are additional challenges such as studentsfrom disadvantaged backgrounds, economic inequality, a lack of access to infrastructure and technology and Internet costs (Brown et al., 2008; Bagarukayo and Kalema, 2015; Queiros and de Villiers, 2016), which also play a role in students' success. The purpose of this study was, however, not to consider the reasons for a lack of self-regulation but to rather gain initial insight into self-regulation patterns.

Time Management

Balduf (2009) found that a lack of time management is one of the causes of underachievement. Given the autonomy provided to students in an online setting, they tend to struggle with time management (Brophy, 2010). Studies from as far back as 1977 (Ellis and Knaus, 1977) and 1992 (Schouwenburg, 1992) indicated a widespread lack of time management amongst university students. Time management involves the adoption of a set of habits, rules and recommendations to manage one's personal time effectively to do as much work as possible within the given amount of time (Lynch and Dembo, 2004; Foltýnek and Motycka, 2009). Within the university environment, there are frequent academic deadlines for tests, examinations and assignments, as well as administrative deadlines such as submitting application forms (Popoola, 2005). Balduf's (2009) interviews with university students revealed that university provided them with freedom and more distractions, resulting in them sleeping during the day, choosing social events over academic commitments, struggling to keep up with the syllabus, being unable to manage their time and studying just before examinations rather than planning their studying. Students thought they had free time because of the structure of university and did not plan their studying or use their time effectively

(Balduf, 2009). Bembenutty (2009) notes that students who plan their studying are willing to sacrifice immediate enjoyment to achieve academic success. Moore et al. (2011) and Peters (1999) concluded that web-based, online courses can require double or triple the time investment in comparison to a face-to-face course. A learner's ability to effectively manage his/her time becomes very important in an online setting (Lynch and Dembo, 2004). Elvers et al. (2003) found that the content accessed by students peaked the day before an examination and even on the day it was written. It was also found that students do not follow the schedules provided to them to guide their online learning (Elvers et al., 2003).

Effective time planning has been found to improve students' level of achievement (Zimmerman, Greenberg, and Weinstein, 1994) and reduce drop-out rates (Gibson, 1998; Eastin and LaRose, 2000). Students who use their time efficiently are more likely to learn and/or perform better than students who do not have good time management skills (Zimmerman, 2002; McCarthy and Kuh, 2006). Learners who are aware of deadlines and can manage them appropriately due to their awareness of the length of time it will take to complete an assignment perform better than those who are unaware of such (Lynch and Dembo, 2004). When students do not plan their schedules, they experience pressure to complete the work, which may result in inaccurate,lower-quality work (Van Eerde, 2003). Furthermore, a lack of time management increases a student's stress levels (Macan et al., 1990). Studies have established negative correlations between procrastination, grades, learning and completion of course work (see, for example, Solomon and Rothblum, 1984; Macan et al., 1990; Michinov et al., 2011). Students who do not manage their time encounter issues with their allocated learning such as preparing for examinations, submitting assignments on time and dealing with deadlines (Balduf, 2009; Visser et al., 2018). They are also less able to retain information in the longterm than students who study on a regular basis (Melton, 1970).

Methods

This study adopted a correlational research design and drew on archival data on full-time students enrolled in Auditing II at the University of the Witwatersrand. The data were used to compare both student online

activity[1] and student academic performance (measured by final course grade). While a correlational design does not allow for an explicit finding of causation (Fraenkel et al., 1993; Tuckman and Harper, 2012), in this study, itwas able to strongly suggest whether or not online behaviour has an association with student academic performance. Furthermore, since a correlational design takes place after data collection without any manipulation or intervention, it enablesthe exploration of naturally occurring relationships between groups.

The population and purposeful sample consisted of all 705 students registered for the Auditing II module in 2020. Auditing II is part of the second-year syllabus for students pursuing a Bachelor of Commerce in Accounting degree or those registered for the Chartered Accountant qualification (Bachelor of Accounting Science), for which it is a prerequisite. In a traditional setting, lectures were offered once a week with a live tutorial every second week. Lectures and tutorials were not recorded, and students had to attend to benefit from the class. Most content such as lecture notes and tutorial material was printed for students. Whether printed or not, it was always uploaded for students on the LMS. Lectures comprised of a lecturer going through the content with students. A revision lecture would also be held before examinations or tests. The pandemic changed all this and required a switch to online learning.

Data Collection

All data were collected from the detailed access logs of the LMS (Sakai) and internal records of student academic performance. Resources were categorised into seven categories, namely, Revision, Lecture Material, Lecture Videos, Tutorial Material, Tutorial Videos, Self-Reflection and Extra Material. Revision relates to additional material on content already lectured. Lecture Material and Tutorial Material refer to documents electronically provided to students for lectures and tutorials, respectively. Lecture Videos and Tutorial Videos are asynchronous recordings provided to students for lectures and tutorials, respectively. Self-Reflection refers to the content which provided students with detailed explanations of their test results. Lastly, Extra Material is any document provided to the

1 Online activity was measured by considering the resources accessed and time to access resources.

students on the course content but not specifically lectured. It included professional guidance, industry examples and research articles of interest to students.

Hypothesis Development

The study aimed to gain initial insight into students' online behaviour during the first implementation of online learning in an ordinarily face-to-face learning environment. To achieve this purpose, four research sub-questions were developed. Firstly, as noted by Queiros and de Villiers (2016), students can experience obstacles when accessing online content (see also, Bharuthram and Kies, 2013). The first research question (RQ1) was thus developed to understand if students were accessing the online resources provided to them:

RQ1: To what extent are students accessing the online resources provided?

Once the extent of access was determined, the researchers aimed to understand the association between resources accessed and academic performance (Robertson and Flowers, 2020). Research question 2 (RQ2) was formulated as follows:

RQ2: Is there an association between online resources accessed and the academic performance of students?

In addition, students have historically had an issue with time management (see, for example, Ellis and Knaus, 1977; Schouwenburg, 1992; Balduf, 2009; Brophy, 2010). Research question 3 (RQ 3) was developed to determine the extent to which students delayed accessing content or if content was accessed on time.

RQ3: How long did students take to access online content after the initial upload onto the LMS?

Lastly, the literature suggests that time delays have a negative association with performance (see, for example, Solomon and Rothblum, 1984; Macan et al., 1990; Michinov et al., 2011). The study thus aimed to determine if there is an association between the time taken to access content and academic performance within a South African context.

RQ4: Is there an association between the time taken to access content and students' academic performance?

Data Analysis

For RQ1, descriptive statistics were calculated based on the categories of online material. These included the average total number of resources, percentage of resources accessed and the difference in access depending on students' marks. For RQ2, a Kendall's-Tau b correlation analysis was performed to assess if there were any correlations amongst the percentage of online resources accessed and student academic performance. Mann Whitney-U tests were used to support the correlations. For RQ3, the difference between when the resource was uploaded on the LMS and when students accessed the data was calculated. All students with a log of online activity were included in the sample (n=702). Descriptive statistics were then calculated to provide an understanding of the average total access times and for each of the categories. For RQ4, a Kendall's-Tau b correlation analysis was performed to assess if there were any correlations amongst the access times and student academic performance. Student academic performance was measured by the final course grade. As with research question two, correlations were supported by Mann Whitney-U tests to assess whether or not the access times differed for passing and failing students.

Results

Table 1: Detailed composition of the resources provided to Auditing II students

Categories	Revision	Lecture Material	Lecture Videos	Tutorial Material	Tutorial Videos	Self-Reflection	Extra Material	Total
Resources uploaded	24	30	40	125	111	36	21	387
Percentage (%)	6%	8%	10%	32%	29%	9%	5%	100%

Overview of Resources Provided

Table 1 provides a breakdown of the 387 resourcesuploaded for the Auditing II course. Tutorial content (notes and videos) accounted for the most resources (61%) uploaded, followed by lecture content (notes and videos) (18%). Tutorial content constitutes a large percentage of the resources because a wide range of tutorials are provided to students to facilitate application of the lecture content. On average, nine tutorials

were provided to students per lecture topic and a video was provided for each to explain the question and solution. Fifteen weekly planners were provided to students and on average only 273 (39%) accessed some planners. Only 45 students (6%) accessed all 15 planners, while 94 (13%) did not access any. Thisis in line withElvers et al.'s (2003) finding that students do not use the schedules provided to guide their studies.

Extent of Access by Students

In terms of resources accessed, 695 (99%) of the students accessed some type of online resource provided, with only ten (1%) not accessing any. Of the ten,seven students did not write the final paper.

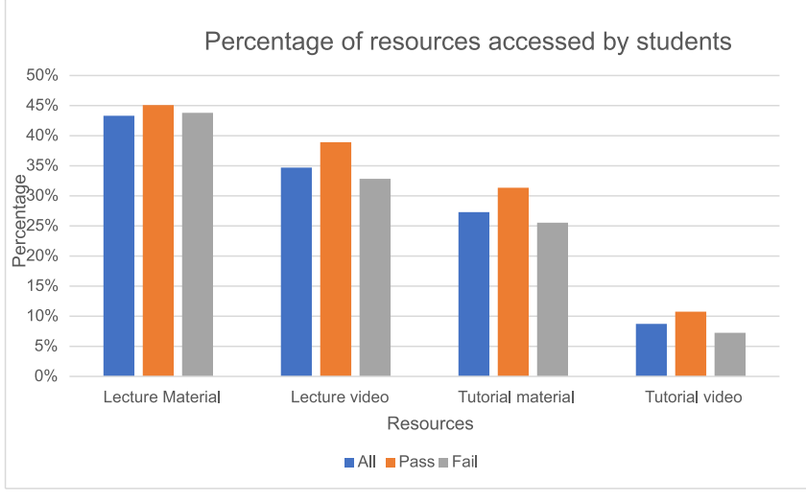

Figure 1: Percentage of resources accessed by Auditing II students

Figure 1 provides an overview of the percentage of all students accessingthe resources, and a breakdown of the figures for those who passed and failed.On average, the students only accessed 23% of the resources provided. Lecture material was accessed the most (43%), whiletutorial videos were accessed the least, with only 9% of the content accessed. The tutorial material accessed was also low at 35%. The low access rates indicate that students may have not completed the majority of the tutorials. This could be because they did not watch the lectures or did not see the benefit of watching the tutorial video. Although studies

by Kirby and McElroy (2003), Hutcheson and Tse (2006) and Horn and Jansen (2009) highlight the positive outcomes of tutorials, the high level of accessing lecture content when compared to tutorial content suggests that students relied on the lectures rather than the tutorials to improve their knowledge. Furthermore, the low levels of accessing lecture videos suggests that students did not gain an understanding of the content or used alternative means to substitute for the lectures and tutorials.

The Association between Accessing Resources and Students' Marks

Figure 1 points to similar trends among passing and failing students, with lecture material being the most accessed and tutorial videos the least. However, access across the resource types is statistically different ($p<0.05$) between passing and failing students[2]. This suggests that accessing more of the content has a positive association with academic performance. The correlations of a Kendall's tau-b presented in Table 2 complement the finding that different types of information are associated with the students' final mark. There is a positive, but weak correlation, between the final marks and the content accessed.

Table 2: Correlation between students' marks and type of resources accessed

		Revision	Lecture material	Lecture video	Tutorial material	Tutorial video	Self-reflection
Final mark	**Correlation Coefficient**	.066*	0.004	.076**	.105**	.058*	.056*

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

As indicated in Table 3, passing students were stratified into percentage ranges. Those in the 70% or above range accessed more resources than students in the lower ranges, particularly with regard to lecture material and tutorial material. Students in the 60%-69% and 50%-59% ranges had a similar access history. This indicates that other factors affected the academic performance of students in the 50%-69% range. Tutorial videos were the least accessed by students who achieved 70% or more. This provides evidence that, in an online setting, lectures and tutorials can be substituted for each other.

2 Findings in an untabulated Mann-Whitney U.

Table 3: Association between level of resources accessed by students and marks range

Topic	Content accessed by Passing students			Content accessed by Failing students
	50% - 59%	60% - 69%	70% or more	< 50 %
Lecture Material	45	45	49	44
Lecture Videos	38	40	43	33
Tutorial Material	30	31	36	26
Tutorial Video	12	10	5	7
Revision	13	12	21	11
Self-reflection	14	15	13	13

Time to access resources

Overall access behaviour

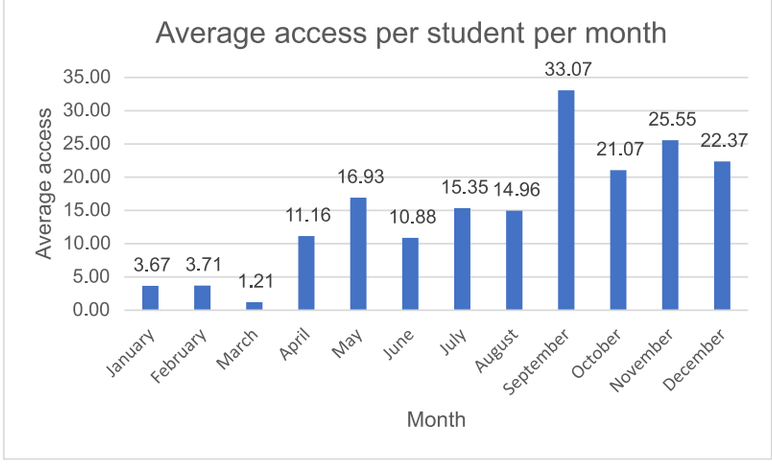

Figure 2: Average resources accessed per month by students

Figure 2 provides an overview of the average access per student per month. Online learning was introduced in April2020 which explains the low access for January to March as traditional lecturing was still in place during this period. However, even when online learning was introduced, overall resource access by students was low. The access patterns suggest

that students accessed resources just before they wrote examinations or tests, rather than accessing content as it was released. The sudden peaks in May, September and November coincide with the assessments written during the academic year. This increase in access before assessments is consistent withElvers et al. (2003) and Balduf (2009) who found that students tend to access resources on a larger scale before or on the day of examinations. The sudden increase in resources accessed by students just before assessments indicates that they may lack the ability to set goals, plan activities and maintain schedules, pointing to ineffective time management (Bembenutty, 2009). The large increase in average resources also suggests that access to the Internet or the ability to access the content (Bagarukayo and Kalema, 2015; Queiros and de Villiers, 2016) may be less of a hindrance to online learning.

Time Taken per Online Resource Content

Resources were uploaded weekly as per a schedule provided to students. As a result, it was expected that students would have accessed resources close to the upload date and would not have taken longer than seven days to do so. However, on average, they took 130 days (approximately four months) to access the resources provided to them. Further analysis of access to the different types of resources is more concerning. The average number of days to access lecture material and lecture videos was 64 and 89, respectively, with students accessing the tutorial material on average after 119 days and tutorial videos accessed 234 days later. The reason for the delay may be that students could access lectures and tutorial content at any point once the content was made available (Hughes, 2009; Robertson and Flowers, 2020). It may also indicate that students were unable to self-regulate their learning, often referred to as procrastination where students voluntarily delay the completion of academic tasks, despite knowing the consequences (Solomon and Rothblum, 1984; Day et al., 2000).

Within a South African context, the lack of time management cannot only be attributed to procrastination. Various factors may influence this behaviour, including connectivity issues, unsuitable/ lack of resources for online learning, home circumstances,the cost of accessing the Internet and a lack of IT skills (Brown et al., 2008; Isabirye and Dlodlo, 2014).

Table 4: Average days to access resources for failing and passing students

Topic	Failing students - Average days	Passing students- Average days	Difference - Average days
Lecture Material	65	56	9
Lecture Videos	102	67	36
Tutorial Material	129	94	36
Tutorial Video	245	214	31
Revision	212	176	36
Self-reflection	70	50	20
Overall average	**137**	**110**	**28**

Table 4 sets out the average number of days that failing and passing students took to access resources. On average, failing students took longer (137 days) to access all resources than passing students (110 days). Failing students accessed lecture material within a similar time period as passing students; however, they took almost a month longer to access the other types of resources.

Table 5: Average days to access resources for passing students per marks range

Topic	Average days for passing students			Average days for failing students
	50% - 59%	60% - 69%	70% or more	Failing - < 50%
Lecture Material	58	54	45	65
Lecture Videos	75	61	36	102
Tutorial Material	107	83	68	129
Tutorial Video	217	215	218	245
Revision	186	173	124	212
Self-reflection	50	47	55	70
Overall average days	**115**	**105**	**91**	**137**

Passing students were stratified in terms of marks range (Table 5). The average number of days to access a particular resource decreased for all types of resources except tutorial videos and self-reflection. This suggests that the students who achieved higher marks tended to have

better time management skills than those who did not, which is consistent with Macan et al. (1990) and Gibson's (1998) findings. Furthermore, not only is time management associated whether a student passes or fails, but it is also associated with his/her mark. As indicated in previous studies, when students procrastinate, it increases the pressure to complete the work to the required quality and has a negative association with marks (Michinov et al., 2011). It is interesting to note that across all ranges, students took similar times to access tutorial videos; however, the number of days taken to access tutorial material differs across the marks range. Tutorial material refers to students completing the tutorial and therefore being able to identify and correct their errors. Merely watching a tutorial video may not produce the same result and could be why students took longer to access the content, although the tutorial video was meant to explain the tutorial and its approach.

Table 6: Correlation of the average days to access content and student's final mark for the course

Days to access		Revision	Lecture material	Lecture videos	Tutorial material	Tutorial videos	Self -reflection
Final mark	**Correlation Coefficient**	-.108**	-.124**	-.159**	-.149**	-.067*	-.073**

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

Table 6 presents a Kendal's-Tau B correlation of the average days to access content and a student's final mark for the course. There are significant negative correlations between the average days to access the types of material and a student's final mark. This indicates that as the number of days to access course material increases, the mark decreases and vice versa. It confirms Cerezo et al. (2017), Van Eerde (2003), and Michinov et al.'s (2011) finding that procrastination is negatively associated with academic performance. Similar to the correlations presented in Table 2, the correlations are weak; however, the coefficients in Table 6 are stronger than those in Table 2 for the same type of content. This means that students did not benefit as much by merely accessing the content and required sufficient time to understand it.

Conclusion

Online learning is gaining more interest given its advantages such as cost-effectiveness, removing borders in studying and offering flexibility (Çakýroglu, 2014; Kauffman, 2015; Queiros and de Villiers, 2016). However, the drop-out rates in online learning are also cause for concern and can be attributed to different factors such as a lack of self-regulation and self-efficacy (Cho and Jonassen, 2009; Cerezo et al., 2017). This research extendedprevious findings by exploring the shift from face-to-face learning to an online environment in a South African context.

Consistent with Lynch and Dembo (2004), Visser et al. (2018) and Michinov et al. (2011), the study found that a delay in accessing resources is associated with poorer academic performance. Students were expected to have accessed online content within seven days of it being made available; however, on average took 130 days to access the content. Possible reasons for the delay include common issues related to online learning such as a lack of self-regulation, resulting in students not being able to complete tasks (Artino, 2008), their inability to manage time (Michinov et al., 2011; Yang et al., 2020), or because students were not familiar with using a computer and lacked the necessary skills (Schrum and Hong, 2002). Within a South African context, this could also be due to other factors such as students' background which impacts their skills in the use of online resources and access to the required resources such as the Internet and computers (Bharuthram and Kies, 2013; Bagarukayo and Kalema, 2015)

Tutorial videos took the longest to be accessed, at about 234 days on average. However, delayed access to asynchronous tutorials is not associated with academic performance. This suggests that they are not equivalent to contact or synchronous tutorials (McGown et al., 1996; Horn and Jansen, 2009).

The long delay in accessing resources was accompanied by poor access of the total number of resources. On average, students only accessed 23% of the total resources available. Lecture material was the most accessed at 43% of the content. However, this still means that more than half the lecture material was not accessed by students. Unlike Gorissen et al. (2012) and Robertson and Flowers (2020), the research results indicate that Auditing II students did not prefer video content as they accessed the notes rather than the videos.

The results indicate that accessing more online content is associated with better academic performance. The correlation is significant but weak, suggesting that accessing resources is not the only factor to consider when evaluating academic performance in an online setting. This supports Garrison (1997) and Artino's (2008) finding that to achieve success, students need to take responsibility for their learning and be committed.

As with any research of this nature, there are inherent limitations and additional research is required. Most notably, the study did not investigate the reasons for delayed access and low levels of access of resources. Future research could consider students' perceptions of the content provided as this may offer insight into why some content is accessed, and other content is not. An important area to investigate is the underlying reason for students' online behaviour given the unique South African context.

The delay in accessing resources and the low number accessed raise concerns regarding the operationalisation of online learning at a contact university. Althoughthe South African National Plan for Higher Educationplaces emphasis on the use of technology to improve education (Bagarukayo and Kalema, 2015), its effective implementation in the local context has not been sufficiently studied. Future research could consider the barriers and key learnings from multiple universities to determine a possible method of implementing online learning more effectively and efficiently.

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