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Pariksha Singh

IT Laboratories, University of Pretoria, pariksha.singh@up.ac.za

Jayshree Harangee

IT Laboratories, University of Pretoria

Tania Prinsloo

IT Laboratories, University of Pretoria

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Reflections and Experiences In a Fundamental Digital Literacy Course: A Study During the Covid-19 Pandemic

Pariksha Singh

IT Laboratories
University of Pretoria
Pariksha.singh@up.ac.za

Jayshree Harangee

IT Laboratories
University of Pretoria

Tania Prinsloo

Department of Informatics
University of Pretoria

Abstract:

When, in 2020, Covid-19 forced universities to close their doors ending face-to-face education and welcoming an online hybrid approach academics had to adjust all educational practices to ensure quality and proper education continued successfully. An introductory Academic Information Management course that deals mainly with computer literacy and has a cohort of over 9000 students had to find ways to help bridge the digital gap using online digital technology. The issues with internet connectivity, load shedding, and students not having compatible devices were just the start of the problems. Many students could cheat the online systems because assessments were not set for online learning; facilitators were not adequately prepared for this new shift to online education, and many felt stressed and overwhelmed. This study discusses the strategies implemented and the lessons learned after universities shutdown in 2020 and the new approach in 2021. Digital technology plays a critical role in online education, and the assumption that students are ready to use any technological system for online learning is considered. Learner-centred teaching and learner engagement is one of the goals the module aims to satisfy. Online collaborative learning theories that deal with constructivism, behaviourism, and cognitivism were explored and implemented to improve teaching and learning. The reflections of this study can help academics in a similar environment adjust to online education and adopt the learning strategies that have proved to be successful. Further investigation is needed to explore approaches to engage and innovate large cohorts of students.

Keywords: Covid-19, Hybrid Approach, Computer Literacy, Learning Theories, Constructivism, Behaviourism, Cognitivism.

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1 Introduction

Inequality, poverty, lack of jobs, and criminality have contributed to the poor quality of the South African educational system (De Groot & Lemanski, 2021; Francis et al., 2020). Most students who enter higher education are not equipped with the digital and information literacy skills needed to survive in higher education (Aumjaud, 2021). Some students enter university without using a computer or even a smart device (Prinsloo & Singh, 2021). When Covid-19 reared its ugly head and forced the educational system to move from a face-to-face environment to a hybrid online model, we, as South African facilitators, scurried to learn new technologies to present courses online to save the academic year. Students had to return home to rural areas where living conditions and the learning environment were not ideal. Many students struggled in confined spaces with other family members sharing the same space (Francis et al., 2020). Some families struggled with access to food and had to depend on the government for Covid-19 relief. Students and educators were thrown into the deep end. Being resilient South Africans, we accepted the challenge and had successful classrooms implemented on learning management systems in a few weeks. The success of these online presentations is debatable. Academic Information Management (AIM) is a compulsory first-year module for students at a leading university with a cohort of over 9000 students per semester and had to adapt to the hybrid online model very quickly. The modular syllabus lends itself to basic computer concepts and applications in information and computer literacy. AIM helps students to reduce the digital divide in their first year.

The AIM course was first developed in 2012 and the curriculum was continuously re-evaluated to remain current. The learning objectives are:

1. Find, evaluate, process, manage and present information resources for academic purposes using appropriate technology.
2. Apply effective search strategies in different technological environments.
3. Demonstrate the ethical and fair use of information resources.
4. Integrate 21st-century communications into the management of academic information.

The AIM course was presented in one two-hour session weekly. Students could attend any one of the 35 scheduled sessions. Each session was attended by approximately 250 students. The course was based on a continuous assessment model where different assessments carried a different weighting that contributed towards their final marks. The major assessments were semester tests weighted at 60% and compulsory assignments weighted 40%. The main activities were the weekly sessions with in-class activities, simulated training, and real-world projects. The AIM course is the golden thread that enables first year students to progress with their studies by equipping them with necessary computer and information literacy skills to complete their studies successfully.

2 Research Approach

The course outline was founded on the learning theory mentioned by Muhajirah (2020); that learning is a process that leads to a change in the student's way of thinking, feeling, and doing that is relatively permanent. The theories involved in this type of learning are behaviourism, cognitivism, and constructivism (Muhajirah, 2020).

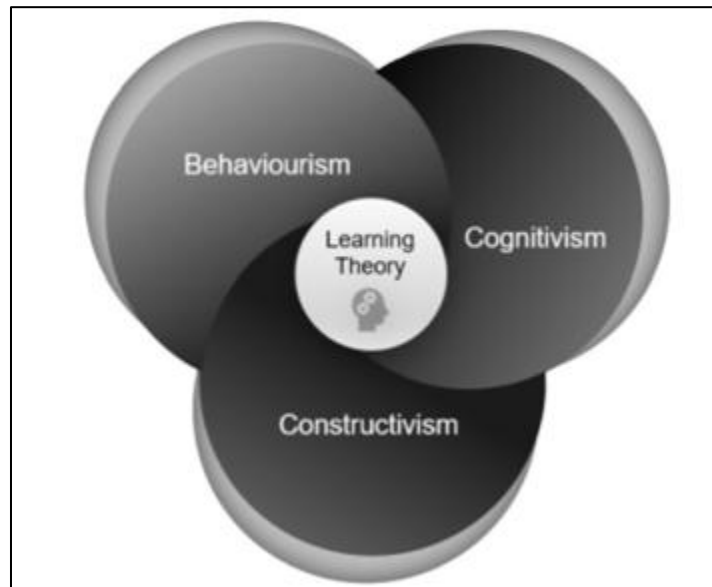


Figure 1. Learning Theory in Designed Instruction (From Cooper's (1993) Behaviourism to Cognitivism to Constructivism)

According to Muhajirah (2020), the behaviourism theory determines behaviour by external stimuli, focusing on what the learner does. This type of learning focuses on basic definitions and explanations of topics and generalisation and recollection. Cognitivism focuses on how students arrange new information and how they process it (Muhajirah, 2020). Higher-order reasoning, information processing, memory and organising are emphasized in this type of learning. Constructivism describes a student's approach to learning new material and applying it to real-world circumstances. This type of learning emphasises problem-solving and critical analysis, focusing on real-world scenarios (Muhajirah, 2020).

We improved the AIM course by embracing this paradigm, which allowed us to lead students toward better knowledge and, eventually, greater freedom in the learning process.

3 From Sinking in 2020 to Swimming in 2021

The movement from a campus-based course to online education was forced upon the education system, a system that was not tested but had to prove successful (Aumjaud, 2021); we needed to make the course work online, as it affected 9000 students. March 2020 created opportunities but introduced limitations that the education sector was not ready to handle.

3.1 From Chaos to Structure

Blackboard Learn is the Learning Management System (LMS) that we used to allow students to view and download the content for each course they registered for during their degree (Darko & Jagger, 2020). Many universities used this learning tool or a similar LMS as it was a platform that allowed instructors to communicate with students. Instructors published their course information to modules, collected students' tests and assignments, graded students' work, and engaged with the students using the integrated communication features (Darko & Jagger, 2020). Although students' interactions and engagements with Blackboard Learn were a vital process that increased their learning, students needed to understand how to interact with the resources and navigate the platform to improve their usage. As a result, the module in 2020 was designed with the idea of face-to-face interaction in mind. With the shift to the online hybrid approach, students struggled to navigate the LMS, leaving them perplexed and frustrated in their attempts to gain access to the content of the module. This was due to the instructor not being able to lead the student in a face-to-face environment. Students were left to navigate on their own.

In 2021, to enforce the behaviourism theory for learning, we created a video showing students how to use Blackboard Learn to navigate the module. We also integrated the resources into Blackboard Learn by developing content areas that organised information according to the students' needs to increase their overall involvement.

We created a fancy banner that drew attention to the course and used content links to connect the most crucial information to the welcome page. The carefully designed welcome page was the starting point for introducing the course and all vital content was easily accessible via the welcome page. This navigation method made students feel in control of their learning material.

In this way, we discovered that when the resources on Blackboard Learn are well-designed and managed, students' engagement, learning, and performance all significantly improved.

3.2 The Interactive Update

The AIM content was based on a Navigating Information Literacy (NIL) section that was predominantly theory and a practical component that required Microsoft Office. The textbooks for the course were provided using MiEbooks. MiEbooks is an application that allows students to actively engage with their e-book and content in an unprecedented way (ITSI, 2016). This e-book system was another educational software product that provided technology support to enforce behaviourism. During the 2020 lockdown, students used the fifth edition of the NIL textbook, which was published in 2017. This textbook was designed as a single source of information containing fact-based knowledge, where students assumed that learning was simply a collection of facts and figures. The textbook had all the answers to the questions, which made students view learning as an accumulation of correct answers.

In 2021 the sixth edition of the e-book was released. The material and design of the book provided a balanced chronological presentation of information. Students had access to various information sources, including websites, videos, and a higher level of questions that encouraged creative thinking and problem-solving. According to cognitivism, learning theory focuses on how information is received, organised, stored, and retrieved by the mind. Therefore, chapters were created based on knowledge and included numerous critical thinking and extending activities for visualisation. The new e-book helped students engage with the content and was not just a reference book. There were links in the e-book that connected students to external resources. These resources were either games, videos, or flashcards. Students were also able to create their own flashcards within the e-book environment. The theory of behaviourism and constructivism also played a role in the development of interactive videos and resources.

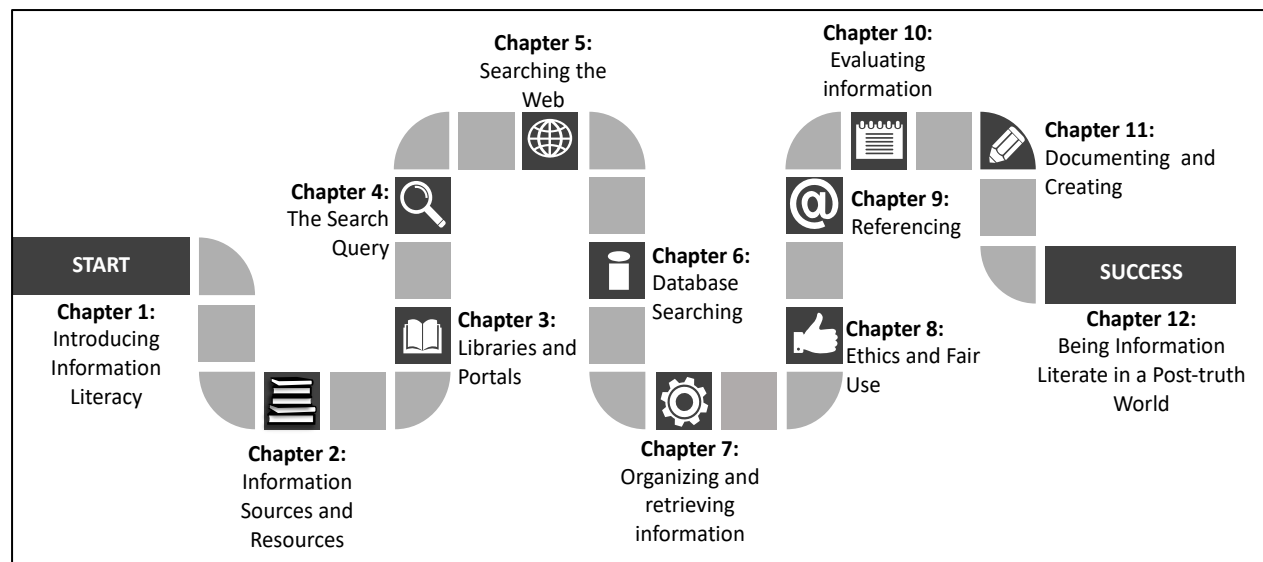


Figure 2. Roadmap Showing of the Chapters Covered in the NIL Book (Bothma, 2021)

3.3 Movement from the Assessment Nightmare

The platform used for disseminating the NIL content resides in Blackboard Learn; however, in 2020, the questions used for testing purposes were based on traditional exam questions used in the past. These questions also advanced students toward surface learning, in which they memorised information without understanding it. The questions did not effectively engage students in mastering the content. Cognitivism was enforced to assist students in exploring and exhibiting rigor in their application of knowledge, and the NIL content questions were modified to higher-order thinking questions. Even though a more extensive

database of questions was created, it was designed so that quality was prioritised over quantity. Questions were designed to not only test a single objective but multiple objectives from the same topic (Figure 3). The questions were now scenario-based, encouraging students to think outside the box and go beyond memorising facts. The students could not search for answers on the internet or copy out of the textbook, and the questions were set so that the students needed to apply their knowledge to the objectives.

2020	2021
<p>1. What is a patent?</p> <ul style="list-style-type: none"> ✓ An official document that grants the inventor or the company the sole right to make use of the invention for a limited period of time. • An official document that grants the inventor or the company the sole right to make use of the invention forever. • A symbol of recognition • Enforceable rules or guidelines that regulate behaviour in society. • The American term for Fair dealing. <p>2. What is a trademark?</p> <ul style="list-style-type: none"> ✓ A design, name or symbol used by a company or a manufacturer to distinguish its products from those of its competitors. • To put something that has been written into other or different words. • Looks at moral values in the information field • The way in which information is used (also see ethics). • Using copyrighted work without obtaining permission from the copyright holder. 	<p>James is a small business owner, and he is trying to be innovative and bring fresh ideas to the business market. To be fully compensated for his creations, James applies for ownership of the products and inventions he uses in his business. Once James' products are licensed, other companies can use his brand name or make products that fall within his patent. What type of rights did James apply for?</p> <ul style="list-style-type: none"> ✓ Intellectual property rights. • Exclusive legal rights. • Ownership rights. • Copyrights. • Ethical and fair use rights.

Figure 3. Example of Database Questions Used for the Theory Questions

The practical assessment component was conducted and taught using a Skills Assessment Manager (SAM), a Cengage (2021) learning software developed to help students gain skills to use Microsoft Office products. SAM embeds instructions into a Microsoft simulation, allowing real-world application-based examples to drive critical thinking and improve applicable skills (Cengage, 2021). Students can participate in training, which tracks their progress and provides insights into their grade book. As per cognitivism, students could rehearse the information they learn in training and store it for long-term use. On the other hand, in 2020 students did not fully use the training system because it did not contribute to their grade.

These graded practical training tasks could be completed before participating in sample project activities or completing assessments. The sample projects allowed individual learning to construct a meaningful end-product based on their knowledge through past experiences. Sample projects with instructions and supporting materials were downloaded and completed using a start file. These sample projects could be completed offline on a computer once they have been downloaded. SAM supplied a score and report as soon as the final result was submitted, detailing the errors and correctness completed for each instruction (Cengage, 2021). Based on behaviourism, this educational software allowed for positive and negative reinforcement. However, because sample projects were minimal, the same projects had to be offered to all 9000 students, which did not prevent students from copying.

These assessment tools reduced the effort of marking and improved feedback to 9000 students. However, the creation of appropriate test items was a time-consuming task to assess content learning outcomes and different knowledge levels. At the end of 2020, all lecturers were required to generate capstone projects designed to include cognitive and constructive learning. Students had to retain their knowledge from the past chapters and training and integrate it into a final project. These were created to expand the number of projects accessible to have different module projects for assessments. The newly created projects were used for testing purposes. To facilitate integrated learning these capstone projects contained the learning outcomes required for AIM and were designed for Microsoft Word, Excel, and PowerPoint. They were also moderated to ensure that the testing quality and standard were adequate.

3.4 The Time Conundrum

The semester grades involved seven compulsory assignments in 2020; each assignment was available for two weeks, allowing three attempts each, and only the highest mark was taken from these attempts. Assignments were completed individually on either Blackboard Learn or the third-party SAM system; depending on the nature of the assessment, students could complete the assignments before or on the last day of the due date. The module included two-semester tests, which contributed 30% each toward the semester mark. Semester test one was composed of two sections, namely section A, which contained the theory aspect. Section B was performed on the SAM platform. Semester test two consisted of all the practical elements which was conducted on the simulated MS Office platform. In this test, students were provided with real-world projects from the SAM program.

The semester test was available for two days and allowed all students to take the test without facing any technical, connection, or power-related issues. Any student that was absent from tests or performed poorly had access to a makeup test to improve their marks.

In 2020 the continuous assessments were associated with deadlines. This showed that students' engagement only peaked a few times throughout the year, usually the days before the assessment deadline. Students did not know about the makeup semester test from the beginning of the year. Due to the large number of students adapting to the online environment, many failed the first-semester test; therefore, we created two catch up semester tests which were carried out on different days during the semester.

In 2021 we allowed access to all course content, including the 11 compulsory assignments. Three attempts were available at the beginning of the semester and closed at specified due dates throughout the semester. Training that was optional in 2020 now contributed towards the students' marks. This allowed students to gain prior knowledge of the content and it organised student's thinking about what they were going to learn and experience in the course. Access to the entire course content permitted students to identify their strengths and weakness in the content. Behaviourism was enforced as if students missed the assignment deadline; no extensions were given because the assessments were opened for long periods of time. This approach allowed the student to pace themselves throughout the semester. Regular reminders were sent to students to prompt them to complete assessments timeously. The learning theory was applied to the assessments focusing on students' learning process and the technology needed during the pandemic.

3.5 The Dishonesty Assumption

In 2020 the database of questions was geared to an invigilated testing environment. Moving to an online environment almost overnight did not allow for the database of questions to be updated accordingly. There was a rising suspicion that not all students did their own work. That led to the updating and creation of scenario-based questions, and all questions set for the semester tests in 2021 were scenario-based; none of the questions used in the database was searchable on the internet. The large number of questions allowed for randomisation of the questions as this ensured that each student received a unique set of questions for the test. This randomisation reduced the chances of repeating the same question between groups of friends that reduced cheating. For the practical section, the projects within SAM contained an auto-grading feature that inspects for integrity violations; even though the module had approximately 9000 students, no student could upload a file that belonged to someone else. This was possible as the SAM program can detect files containing content copied and pasted from another student's start file and if the file contains information from another assignment or site. This validation process also lends to the behaviourism theory, where negative reinforcement is portrayed when students attempted to be dishonest.

3.6 From Mountains to Molehills

Initially, nobody was prepared for the new Covid-19 situation, and everything resulted in panic and fear. As the new normal set in, everybody became more comfortable and initial challenges became much easier to deal with. A few of them are discussed below.

3.6.1 Our Loudspeaker

Sending regular announcements or email reminders was rated as an essential engagement strategy by Martin and Bolliger (2018). During lockdown in 2020, we sent out announcements regularly to remind students of due assessments and forthcoming semester tests. To our disadvantage, the students found this to be too overwhelming, as one of the Blackboard Learn features included the ability to send an email to the students. We used this feature as we thought it would help them. However, they complained about email fatigue or receiving too many from several modules and not having enough time to read them all. In addition, we found that there was a lack of student participation in the emails as some students adjusted well to electronic communication while others struggled. Students who did not adapt generally did not participate, and since emails are private, there was nothing to promote or ensure student engagement. The overuse of these features went against the learning theory as this was not a student-centred approach.

In 2021 we streamlined all communication and only sent out mass communication occasionally when information was most important. All other necessary information was readily available in the LMS. By reducing the number of emails sent students complained less about email fatigue.

3.6.2 Our Diary of Thoughts

One of the features of Blackboard Learn is discussion boards. Students could contact their lecturers via email for any questions they had in 2020, only a single thread called General queries was created. Students did not use the platform; instead, they emailed their instructors. During semester tests, the lecturers' inboxes were flooded with emails from students with questions; students emailed about trivial errors; they also waited until the last minute to submit their test, but their connection lagged due to an overload of submissions to the test servers, and the deadline lapsed.

Throughout the semester of 2021, the discussion board was used more effectively to answer all student questions. A discussion board was created with numerous threads on all the issues that students faced frequently (Figure 4). Assistant lecturers were assigned to specific sessions daily to maintain updates on the discussion board. We noticed that when semester assessments were due, students used the discussion board to query, rather than emailing their lecturer, which lowered tension and anxiety for both the lecturer and the students. We created a semester test discussion board that was open for the whole day during the semester tests. As a result, many students could submit their work on time because their questions were answered regularly. To ensure that we provided consistent, correct, and valid responses to all students, we created a frequently asked questions booklet for the lecturers, which contained solutions to students' difficulties throughout the semester test. This document was updated regularly throughout the semester. The discussion board proved more successful as it aligned with constructivism, where students used other students' posts to enhance their learning.

Thread action	Date	Thread	Status	Unread posts	Unread replies	Total posts
<input type="checkbox"/>	05/05/2021	Navigating Information Literacy	Published	0	0	41
<input type="checkbox"/>	05/05/2021	The site can't be reached	Published	0	0	46
<input type="checkbox"/>	05/05/2021	Cannot download all support files	Published	0	0	46
<input type="checkbox"/>	05/05/2021	Technical Issues	Published	0	0	260
<input type="checkbox"/>	05/05/2021	General Queries	Published	0	0	468
<input type="checkbox"/>	05/05/2021	Resubmit error	Published	0	0	157
<input type="checkbox"/>	05/05/2021	Mark not reflecting/ Marks reflect 0%	Published	0	0	410
<input type="checkbox"/>	05/05/2021	Cannot submit due to file name	Published	0	0	104

Figure 4. Discussion board made for semester test 1 in 2021

3.6.3 Our Window to Students sitting Behind the Covid-19 Screen

Blackboard Collaborate was the platform we used to hold contact sessions with the students. These sessions were a Blackboard Learn feature that allowed for browser-based web conferencing without installing any software and provided quick access to all students and facilitators. We were able to focus on student engagement rather than technology management because the capabilities of Blackboard Collaborate were intuitive after using the platform for a few weeks. Because students could access the platform from their phone, laptop, or tablet, they could stay involved no matter where they were. This access allowed students to participate in sessions or study groups remotely. We could record the session and give students access to it through the internet, allowing them to pause, rewind, or fast-forward through the lectures.

Since online learning was new to us, Blackboard Collaborate sessions were made available from Monday to Friday in 2020. The platform was difficult to navigate for some of the students at first. They did not have devices to attend classes, and they needed significant data fees, so attendance was limited. It took a long time for the zero-rated UP connect page to load for students to get started. A zero-rated platform is a web-browser based virtual private network platform that allows a user to access the LMS without incurring any charges from a mobile data balance (University of Pretoria, 2021). Some of the sessions did not fit into the students' timetables as they overlapped with their other modules. Classes were over 350 students; therefore, the LMS tools like the chat-box was disabled. Assistant lecturers were also new to the online learning platform, providing a content-based session with minimal student interaction. In 2021, training sessions scheduled for learning content included technology that enhanced the cognitivism theory for all lecturers in the design of the course. We created sessions from Monday to Saturday, from 07:00 until 17:30 daily. Students could attend any session that suited their schedule. Students had more sessions to choose from, leading to smaller group sizes; therefore, allowing the tools available in the LMS to be utilised effectively, including the chat-box, polls, and video responses.

3.6.4 Our Journey to Better Scheduling

Weekly schedules were provided so students could know what was required of them beforehand. However, when lockdown began in 2020, the schedules continued to change due to government and university policies for Covid-19. These schedule updates caused due dates to change and left the students confused about what to follow. Schedule changes contributed to extending assignment deadlines. Students, therefore, did not consider the latest schedules and did not take responsibility for their learning as too many changes occurred over a short period (Figure 5).

AIM 111 Weekly and Assessments Schedule 1st Semester 2020	
AMENDED SCHEDULE	
All work will be done online: - via videos, PowerPoint presentations, Blackboard Learn, etc. Mark Weighting will also change	
4th – 8th May 2020	
Content Covered	Weekly Assessment
<i>Navigating Information Literacy:</i> Chapter 9: Referencing <i>Navigating Office 2019:</i> Getting started with Excel	Assignment 4 & 5 will be due on the 8 th May 2020 <i>(These assignments opened early in March and before the vacation / lockdown period).</i> Assignment 6: Microsoft Excel (SAM) Due date: 29th May @ 14h00 (No late submissions will be accepted) Contributes to Final Mark

Figure 5. Weekly schedule for 2020

In the current times, the schedules were set beforehand. They were well prepared, and all assignments opened at the beginning of the semester; this was due to the course management deciding to remain

online for the entire semester and relating to the concept of behaviourism. Students had full access to all the content, and they could prepare in advance and work at their own pace. Semester test dates were given in advance so students could prepare accordingly. The schedule was also updated compared to 2020 to include what students needed to complete per week (Figure 6).

AIM 111 Weekly and Assessments Schedule 1st Semester 2021	
Please note AIM 111 is a continuous assessment module and all compulsory assignments contribute to your final mark. These compulsory assignments are open and have different closing dates. All tests also contribute to your final mark. This module does not have a final exam or supplementary exam. Consistent hard work and attendance is required from day 1.	
17th – 21st May 2021 (WEEK 8)	
Content Covered	Weekly Assessment
<i>Navigating Information Literacy:</i> Chapter 8: Ethics and Fair Use <i>Navigating Office 2019:</i> Excel Module 1: Getting started with Excel TO DO THIS WEEK: <ul style="list-style-type: none"> • Read Chapter 1 and watch Chapter 1 video • Complete training for Excel Module 1 • Complete Excel exercise for extra practice 	Assignment 8: Ethics and Fair Use Due date: 28th May 2021 @14:00 (No late submissions will be accepted) Contributes to Final Mark

Figure 6. Weekly schedule for 2021

3.6.5 The Scurry for Devices

Many students did not have devices at the beginning of the lockdown period, and the university had to make provision for a time-consuming delivery period for such students (Prinsloo & Singh, 2021). These left students feeling frustrated and depressed as learning had to continue, and by the time the devices arrived, they had missed some deadlines or just had too much work to catch up and complete. During the middle of the semester, all registered students could apply to loan a device from the university and approximately 2 000 loan laptops were supplied to all those who qualified (Prinsloo & Singh, 2021). As a result, students had to begin working to the best of their ability to catch up on their workload and meet deadlines.

With the forward movement to online learning at the beginning of the year, students were aware of what devices were required for the module. Residences opened for all disadvantaged students to stay and use the facilities for studying. Permits were provided to students to make use of the computer labs, and also loan laptops were provided in advance for students to complete their work. The schedules were developed where all assessment deadlines and semester test dates were provided in advance so students without devices could make alternative arrangements to achieve their required deadlines.

3.6.6 The Horror of Connectivity and Load-shedding

Many impoverished students were caught in a catch-22 situation where they were required to finish their studies to save the academic year, but they also had to contend with inadequate resources and unsupportive social environments (Mgutshini et al., 2021). Unfortunately, during the Covid-19 lockdown in 2020, this was beyond our control. Students from rural areas were permitted access to the labs and to stay in residence for the academic year 2021.

Another big issue that we continue to confront is load-shedding; a shortage of electricity causes poor to no connectivity, making it difficult for both assistant lecturers and students to participate in online learning.

Load-shedding was pre-scheduled; however, when the power grid became overwhelmed with the consumption of electricity, power cuts were implemented on short notice and could last for up to a week or longer. Depending on the stage of load-shedding electricity was switched off between 2 and 6 hours in a 24-hour cycle. We could only address this by making all assessments available at the start of the semester, allowing students to complete their mandatory assignments before the deadline. This arrangement was also made to enforce behaviourism, in which students were held accountable for their time management. In addition, more than one assistant lecturer from different locations was placed in a Blackboard Collaborate session to ensure that online classes ran as scheduled. Students who missed the lecture due to load shedding could access the lecture recordings or attend another planned session for the week.

3.6.7 From Kilobytes to Gigabytes

According to Mhlanga and Moloi (2020), the South African government partnered with private network providers to offer zero-rated applications and educational websites due to Covid-19. These applications and websites were provided by many network operators, including Vodacom, Cell C, and MTN. In April 2020, the university officially launched the connect portal for students and staff to access their digital content and online assessment without incurring any data charges (University of Pretoria, 2021). The platform aimed to increase access to digital content and enhance opportunities for continuous assessment activities to support curriculum delivery in the AIM module. However, the platform could only be used for the university's web page, Blackboard Learn, and library services. The connect portal was also dependent on the quality of the university's internet connection, making it difficult for some students to access this platform due to a lack of devices and internet connection. Due to the limitations of the connect portal, the university provided 20GB (10GB any time + 10GB night-time) of data per student to be used for tests and examinations. This data also allowed students to access other platforms that required data costs; however, students were responsible for managing their data for the semester as part of the behaviourism theory.

3.6.8 The Joy of Video Creation

From the beginning of 2021, creating online content was a critical step. Voice-over PowerPoint videos were made to go over the content and interact with the activities given (Prinsloo & Singh, 2021). As a result, the work was divided among the assistant lecturers, who generated appropriate content for each student (Prinsloo & Singh, 2021). The videos, however, were not consistent between the chapters; they were also too long and not very engaging. Each video covered a chapter with many different objectives thereby making it between 30 to 45 minutes each. This increased the student's cognitive load (Brame, 2016). Assistant lecturers were not equipped with the correct tools for video creation; therefore, audio quality was poor. Looking at the learning theory of behaviourism, cognitivism, and constructivism, improvements in the 2021 videos were made to allow self-guided learning related to the constructivism theory. A standardised template was created and approved for all the assistant lecturers to follow. This change relates to the idea of cognitivism, where the video represented a visual tool to enhance learning. To reduce the cognitive load, the length of the videos was reduced to 10 to 12 minutes (The University of Alabama at Birmingham, 2021). Interactive exercises were included in the video creation for student engagement. The voice-overs were conducted by one person, who had all the required equipment like noise-cancelling headsets and a professional microphone. All video scripts went through a series of moderation to ensure the language, grammar, and content were of a good standard. Many students used the newly created videos during semester test periods for revision (Prinsloo & Singh, 2021).

3.7 Summary of Our Adventure

Table 1 below is a summary of our advancements from 2020 to 2021 and how we addressed the different aspects in our course as well as the improvements and recommendations for the future.

Table 1. Summary of Our Adventure

Headlines	2020	2021	Improvement for the future
From chaos to structure	Blackboard Collaborate was designed with face-face interaction in mind and students were shown during lectures how to navigate the system.	Organisation of online content was well thought out, interaction via video.	Take into consideration students with learning disabilities in structuring the module for example visually impaired, colour blind.
The interactive update	Traditional textbook with no student engagement.	E-book with enhanced features for student engagement such as videos, flashcards, online resources.	Track student engagement with the e-book.
Headlines	2020	2021	Improvement for the future
Movement from the assessment nightmare	Questions were set in a traditional way for proctored.	Questions were changed to scenario based which were not Googleable.	Create scenarios that are based on current South African related content.
The time conundrum	Rigid assessment schedule.	Flexible assessment schedule.	Enhance learning using the adaptive release tool in the LMS.
The dishonesty assumption	No randomisation.	Enhanced integrity/violation checking.	Randomisation of practical questions
Our loudspeaker	Overwhelming message content	Reduced email fatigue.	Find the balance using a student-centred approach for communication.
Our diary of thoughts	Unorganised discussion board.	Organised discussion board with relevant threads.	Encourage student engagement.
Our window to students sitting behind the Covid-19 screen	Stringent online lecture schedule.	Flexible online lecture schedule with Saturday classes and enhanced student engagement.	Introduce pre and post class activities.
Our journey to better scheduling	Continuous changing of content timelines due to government and universities regulations due to Covid-19.	Set content schedule with all due dates for improved time management.	
The scurry for devices	Loan devices from the universities allocated to students who met certain conditions.	Access to labs at residence, access to the university labs for students with permits.	Access to labs with generators and a stable internet connection at the university.
The horror of connectivity and load shedding			
From kilobytes to gigabytes	Connect portal was created that allowed zero-rated applications.	Connect portal was enhanced, third party tools were also zero-rated, the university provided data to students.	
The joy of video creation	Created videos with no guidelines and time limits.	Set guidelines recommended video time limits of 10 – 12 minutes were followed. Videos and video scripts were moderated.	Create videos with assessments using online tools.

3.8 The Beginning of the End

When Covid-19 struck, it filled the world with fear of the uncertainty. To better respond to a crisis of this magnitude, a few things needed to happen in order for the course to continue during lockdown and

beyond. One of the very first things that needed to happen, was a paradigm shift in the management of the AIM course. This happened in three stages, as discussed by Smith and Elliott (2007):

3.8.1 Stage 1: Crisis of Management

It was crucial that the management fully understood and comprehended the magnitude of the crisis. Management had to sit and plan for the immediate future and how things needed to change, and quickly. In this specific case, quick and concise decisions led to actions that made it possible to still plan and solve the most pressing issues, while still maintaining the course and continuing with minimal setbacks.

3.8.2 Stage 2: Operational Crisis

All the major changes that were needed had to be planned for and addressed. It was necessary that the management and the lecturers had to discuss the way forward in various meetings. Brainstorming sessions were conducted to gain a complete perspective of the different aspects that needed to be addressed.

3.8.3 Stage 3: Crisis of Legitimation

The Covid-19 pandemic now has a less severe effect than it did in 2020 and 2021 when everything was impacted. While we were in the crisis, we had to make changes that impacted the immediate semester or two, but also had significant potential impacts in the long run. With students slowly returning back to campus, some for the first time, even when they have been a student for three years. Their studies and learning environments still need to be relevant for them. One solution with the AIM students is to still present the majority of the classes online, as this course has sufficient resources, but to then allow the novice students to attend contact classes, as they are not very comfortable using technology.

3.8.4 High-level Lessons Learnt from the Covid-19 crisis

As part of reflecting on our journey of AIM from 2020 to 2021 and beyond, we would like to highlight five aspects that we feel can benefit other institutions in crisis:

- The first very important aspect is that students needed clear and accurate information regularly. We needed to remove communication barriers, and in doing so, we needed to ensure that all students had devices and access to the Internet. After those aspects were in place, the LMS had to be very clear and simple to navigate. Students had to have sufficient resources, but not be completely overwhelmed with constant new information. It is crucial that students have access to all the relevant information at their fingertips but are not bombarded with too many emails. Email correspondence should only be sent out when necessary.
- The second aspect that needed to be addressed effectively was ensuring that students can effectively learn in the new online environment. To cater to a large variety of learning modalities, lecturers need to provide adequate and relevant learning resources for the students. What worked well for AIM was to record moderated content videos of between 10 and 12 minutes, provide learners with an interactive e-book, and present live lectures using games and quizzes to keep them interactive. Using a variety of assessment methods, online help sessions and regular assessments with feedback made it easier for students to successfully complete the course. Assessments need to be set up in a way that the answers cannot be found when performing a Google search. Also, assessments should test more than one element of learning and should include applicable examples.
- The third aspect that we needed to tackle was to ensure all students were in an environment that was conducive to learning. As a country with massive socio-economic challenges, some of the underprivileged students had to share a room with nine other people. The university realised that some students also have no food, water, or electricity to charge their devices. That led to the university residences opening in 2021 for needy students.
- The fourth aspect of importance was that of the staff being trained and able to work in the online environment. There were numerous online training sessions to equip lecturers and administrative staff with all the required skills.
- Finally, in terms of load-shedding or any other natural disaster, the best way to mitigate its risk is to allow assessments to be open and available to students over a longer period of time.

4 Conclusion

Covid-19's shutdown has caused significant disruptions to 2020's academic activities. Nobody was prepared, and everyone had to learn as they progressed. A number of key issues were faced, such as a lack of devices for students, load-shedding, and unsuitable conditions for students to study from home. In 2021, the university was much better prepared for the Covid-19 pandemic and addressed key issues head-on. As part of helping the disadvantaged students, students could apply for a permit to move back to the university's residences. This arrangement allowed students access to proper shelter, food, and the required devices to complete their studies. Due to the continuous risk of load-shedding, assignments were open from the beginning of the semester, allowing students to complete them at any time before the due date. This article reflects on how the course was still presented effectively, amid the COVID-19 pandemic.

4.1 Methodological Contribution

In this article, we use the framework of Muhajirah (2020), and we discuss the challenges and experiences through the lenses of behaviourism, cognitivism, and constructivism. By concentrating on the student in their environment, we were able to address challenges and focus our efforts to teach students using a variety of methods and strategies, in terms of behaviourism. We focused on cognitivism strongly in the way that the content was delivered. Many different activities were given, all enabling the students to learn and apply the work to a given situation. In terms of constructivism, we ensured that our course and its examples have a real-world look and feel.

4.2 Practical Contribution

The way that we had to go about taking 9000 students all from different socio-economic backgrounds and equipping them with everything they needed to successfully complete the fundamental AIM course had a lot of problems and challenges. We sketch a picture of what we went through, how we dealt with Covid-19 restrictions, and how we had to ensure that nobody is left behind. The sheer logistics behind giving students loan-laptops, data, basic computing skills, getting all the students in groups to attend different online sessions and presenting it in a conducive manner was a mammoth task. We hope that this article can provide the reader with a picture of our context, to illustrate the resilience of the staff and students, and to inspire others to overcome similar challenges, or any crisis, by applying some of the techniques we discussed.

4.3 Future Research

Future research should investigate how a course such as AIM can continuously improve to keep the large group of students engaged and complete the course successfully. Also, in light of the Covid-19 crisis, we are all better equipped to deal with the unknown. We will continue to report on the management and teaching of large cohorts of students in the range of 9000. We would like to implement and evaluate the Hyflex model for large cohorts of students focusing on teaching, learning and assessment. The flexibility of this model will focus on student success and can also help institutions continue their educational activities in the event of a disruption.

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About the Authors

Pariksha Singh has been in higher education for over two decades, where student-centred education is her goal. As a manager of Student Relations, her key focus is based on improving teaching, learning and assessments for courses with huge numbers. Pariksha is currently involved with information and digital literacy for first-year university students, and her primary area of research is to personalise learning for academic information management. Dealing with cohorts of over 9000 students, technology has become one of the leading resources used for teaching, learning and assessment. Her focus is to use technology effectively and efficiently to improve the lives of all students. Pariksha works with a wide range of stakeholders in bridging the gap using Academic Information Management between school and first-year university students.

Jayshree Harangee is a master's alumna of the University of Pretoria. For the past four years, Jayshree has worked in the computer literacy section as a skilled assistant lecturer at the School of Information Technology. Based on her experience, she could grow within her position and mentor other lecturers; she also engaged in creating content material within multiple modules of the computer literacy course. Jayshree was also the first South African ambassador for Cengage, an international platform providing global digital educational content to institutions. Research and lecturing have always been the highlight of her student years. Therefore, her educational goals include obtaining a PhD to pursue a career as an academic.

Tania Prinsloo is a senior lecturer in the Informatics Department of the University of Pretoria. Her research focus is mainly ICT4D and ICT for Education. She has published five journal articles and was nominated for the Research Director position for SIGED, where she now serves. Her love for teaching and the severe impact that Covid-19 had on poor and marginalized students have been the focus of her latest research. She hoped to be back in the classroom again full-time from 2022.

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