

# Examinations in the Higher Education Space

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**Abstract:** Universities are central to society in that they contribute extensively to the delivery of competencies, skills and knowledge essential to the hi-tech world we have developed since the beginning of the industrial revolution. The Covid pandemic has forced academe to rethink the strategies that are used to assess students' competence. The purpose of this interpretive paper is to reflect on online examinations. In this paper, a short outline of traditional examinations is considered and compared with current examinations. This is important because it appears that examination strategies have not sufficiently evolved over the years to reflect the current circumstances. The different issues that affect the digital learning space are examined and some of the challenges are assessed. The practical implications of this research are that we as academe need to co-create the learning journey with our students.

**Keywords:** Examinations challenges, Ritual of examinations, Assessments challenges, examination trust, Open Distance e-Learning, Cheating in examinations, Digital Scholarship

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## 1. Introduction

The purpose of the paper is to highlight the challenges faced by the academic system to the creation, delivery, and evaluation of examinations. Examinations have always been important to the academic system, but they have not evolved to support current academic needs and this issue must be addressed. The purpose and importance of examinations is multifold and can be considered from the perspectives of the candidate, the academic teaching staff, the university, and external stakeholders. From the candidate's perspective successfully passing an examination indicates a level of mastery of the required academic material. From the point of view of the teaching staff, the examination is used as a means of measuring the effectiveness of their teaching ability. The university uses examinations as a vehicle to promote successful candidates to the next academic level of the learning journey as well as to claim funding from government agencies. Finally, external stakeholders trust that the examination process has produced capable graduates with whom they can engage. The role of examinations within the university space is complex.

The University has long been recognised as the pinnacle of our education system. University education begins with admission into an undergraduate program, which for some is also the foundation for postgraduate studies. In some rare circumstances, recognition of prior learning would allow some individuals access to undergraduate programs (based on the maturity of the candidate or industry experience) or certain postgraduate degrees. Generally, however, postgraduate courses are sophisticated research-driven degrees that are built on the foundation of an appropriate undergraduate degree. The research candidate is expected to identify a researchable problem, then use appropriate technologies and methods to develop a better understanding or solution to the problem. Before the Internet, and in the tradition of undergraduate shared "group" work, postgraduate research candidates would work in small communities of practices or groups and would share their research findings within those groups. The Internet has changed the culture of universities meaning that increasingly undergraduate and postgraduate candidates are using the internet to support their learning journey.

It is important to note that apart from governments, universities have been at the forefront of adopting or developing new technology. Universities have over the years invested in hardware, software, networking infrastructure, online databases, and mobile platforms. Despite this investment, university technology has often appeared fragmented or disorganized, but due to the COVID-19 pandemic university systems are being revitalised and a new form of scholarship is taking root - 'digital scholarship'. Remenyi & Greener (2016) refer to digital scholarship as the use of the internet, the Web as well as other electronic technologies to facilitate the development of research. They confine their definition to the postgraduate journey, but the COVID-19 pandemic has encouraged us to see digital scholarship with a wider lens and to include the undergraduate journey as well.

The undergraduate journey has largely been influenced by examinations (summative assessments) that evaluate the candidate's proficiency at the end of the academic year or semester. An examination can be seen as an

opportunity for candidates to demonstrate their level of understanding and competence within a particular area of study. Examinations are important events for both candidates and academics, and produces a variety of outcomes, some of which are not always satisfactory. Due to the importance placed on examinations, some form of cheating will inevitably occur. Furthermore, examinations have always been problematic for faculty because the faculty members must explore innovative ways to establish what the candidates have learnt. This innovation requires intensive labour both for the preparation of the examination and the evaluation of the examination. Examinations do not produce a good feeling for the candidates or the academics. This challenge with examinations has become even more intense with the massification of the high education system.

## **2. Academe in Context**

The COVID-19 pandemic has revealed gaps within the academic space. All academic disciplines find themselves in an uncomfortable predicament. University management and academics have had to make difficult and unpopular decisions within a constrained environment (Felson and Adamczyk, 2021). The academic community appears to lack the sophistication to adequately factor in the emotional well-being of students (Güner, 2021; Liu, Chen and Dang, 2021) and colleagues (Bashitialshaaer, Alhendawi and Avery, 2021). Some universities have developed safety nets to protect their students and examinations (Chadha, Maraj and Kogelbauer, 2020). Examinations are an important event during the academic journey of a student and with the COVID-19 pandemic, universities are developing sophisticated proctoring strategies (Khalaf *et al.*, 2020). Proctoring or online proctoring is the act of using computer hardware and software with some level of artificial intelligence to monitor candidates taking an examination. While the general sentiment towards online learning appears positive (Asare *et al.*, 2021), universities lack the appropriate experience to deliver effective online proctored examinations (Clark *et al.*, 2020). The question that arises is “How have universities advanced examinations?”

## **3. Context: The author, ODeI, and digital scholarship**

Within the higher education space, there are two broad approaches to education: the first is the residential university with face-to-face teaching and the second is distance education. The author is an academic and academic manager at the largest and only Open Distance e-Learning (ODeI) university in South Africa. In 2018, the University enrolled 373,747 candidates and delivered 52,318 graduates (University of South Africa, 2018). Previously students would register at the university, conduct their learning via an online portal, and at the end of the module students would write an in person examination. The ODeI model aspires to develop a community of practice between the key stakeholders, i.e the academics, the candidates, and the institution (Manyike, 2017) by actively using technology (Ngubane-Mokiwa, 2017). The unintended consequence of the ODeI model is that the entire community has become digital scholars. During this pandemic, social distancing to prevent the spread of COVID-19 was not an issue because the university was already using an ODeI model and the University management agreed that all examinations proceed as scheduled, the caveat being that they would be online and that examination papers would be modified to suit the online environment.

## **4. Reflection on Examinations**

### **4.1 The Ritual of Examinations /Assessments**

Examinations/assessments are the bedrock of our contemporary education system (Hickey *et al.*, 2006). Remarkably at the undergraduate level, very little has changed with the format of examinations over the years. Imperial Chinese examinations are the first known written examinations (Wilbrink, 1997). Much like in the Chinese tradition, sophisticated memorisations (Hu, 1984) of material to be regurgitated at examinations are still the order of the day. It was not uncommon for aspiring Chinese scholars to “collect essays by successful candidates in previous examinations” and try to replicate these essays in their examinations. Within the Chinese system, several inappropriate practices developed (Hu, 1984), such as:

- Memorising essays of successful candidates to be reproduced in examinations,
- Cribbing,
- Substitution of a student which involved bribing examiners,
- Post examination switching of examination papers which involved bribing examiners.

The Chinese authorities introduced countermeasures such as:

- Frisking examinees from head to toe, (today's digital equivalent is signal jamming technology)
- Constant patrolling of the examination hall, (we still invigilate examinations in person and with technology)

- Anonymity of the examiners, (we still use second examiners, moderators, and re-mark examiners)
- Reproducing essays to avoid recognition through handwriting, (we have developed sophisticated multiple-choice questions as one deterrent)
- Re-examination of successful essays, (we still use the moderator and external examiner) and
- Execution, (today we have trial by social media which negatively affects the university's image leaving a digital scar against the university (Singh and Mendy, 2019)).

The University of Paris and the University of Bologna in the 12 century were the first modern era universities to introduce examinations. The candidates knew the examination questions in advance and were required to demonstrate their ability to memorise the material (Madaus and O'Dwyer, 1999). Joan Cele is credited with creating the European examination model, with the objective of promoting candidates based on merit (Wilbrink, 1997). It was not uncommon, much like in the Chinese tradition, for 'examination compendia' containing model solutions to past questions to be made available to candidates. Within the European model, failing a student was a rare event, and the system experienced the same challenges as the Chinese system, namely, fraud, stress, coaching, cheating, and lying (Wilbrink, 1997). With both the Chinese and European models of examinations, only a small sample of the examinee's understanding of the material (Madaus and O'Dwyer, 1999) gathered in a stressful environment was obtained. Within the European system, the practice of payment by results emerged as teachers were offered an additional reward for each student that passed. This reward practice still exists today in the form of government subsidies for candidates that successfully graduate.

Much like in the past, contemporary academics still struggle to develop authentic examinations (Madaus and O'Dwyer, 1999). In an attempt to develop authentic examinations at the author's ODeL university, a variety of new tools are used (Dierick and Dochy, 2001):

- Portfolio Assessment – a purposeful written/electronic collection of the candidates' learning journey.
- OverAll Test – a sophisticated test that measures the extent to which a student can analyse and problem solve in a defined context.
- Self-Assessment – candidates make judgments about their success and challenges through the learning journey.
- Peer-Assessment – a process where individual candidates or groups of candidates rate their peers.
- Co-assessment – both candidates and academic staff are involved in the assessment process.

These are sophisticated, labour-intensive examination strategies. It may be argued that at the undergraduate level some of the examinations are an intellectually barren exercise. We have not progressed much from the early Chinese and European systems. What has been successfully achieved is the development of sophisticated examinations using frameworks such as Bloom's Taxonomy. Examinations at the undergraduate level, driven by the massification of the education system, appear to serve a ritualistic function – a right of passage to the next level.

Within the academic space, cheating in examinations is frowned upon at best, or regarded as a disciplinary matter leading to expulsion at worst. The question is "*why is cheating in examinations still frowned upon?*" There is the argument that the cheater is taking an unfair advantage and the examination process is being undermined. This view is probably driven by the long-standing moral imperatives of "Thou shalt not steal" and "Thou shalt not bear false witness against thy neighbour" (The Church has had a long-standing relationship with the university and has influenced university culture). Is it not plausible that these traditional moral imperatives are less appropriate for our contemporary society? In Information Systems and Computer Science, we teach programming and the notion of reuse. There are several repositories on the Internet that provide free programming code that can be "copy, cut, and pasted" into a software artifact with little to no recognition of the original programmers. The Open Access movement is arguing for the lifting of restrictions on academic research. The Free and Open-Source software movement is also championing the lifting of restrictions on software. Some websites provide free access to research papers. These are some examples of the blurring in attitude to the idea of originality (Simons, 2011). Within our learning spaces, we are developing learning communities and we are encouraging the sharing of knowledge, sometimes without acknowledging the original authors of these ideas. Is this a bad phenomenon? Possibly the question we should be asking is: *Why not (cheat) re-purpose?*

## 4.2 Online Examinations

Online examinations have introduced a different level of trust issues for the candidate. With traditional examinations, universities would develop strict policies that:

- Banned mobile devices in examination halls,
- Provided pre-seating for candidates,
- Ensured reasonable distancing to minimise communication.

In some bizarre situations, the cheating deterrents can be described as inhumane, Figure 1 for example demonstrates some demeaning examination practices.



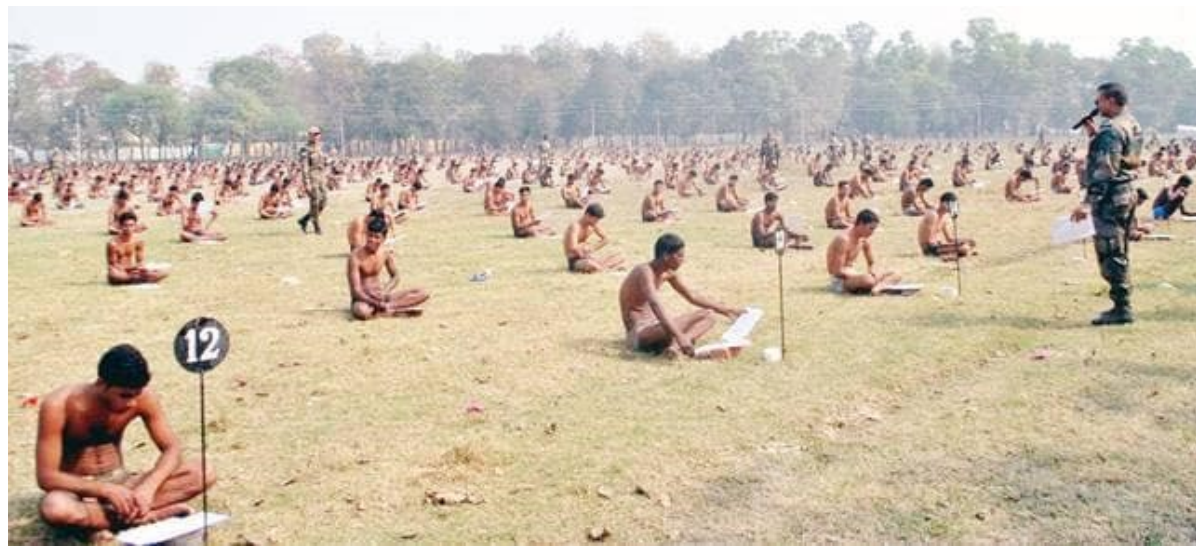
Source (W1, 2017)

Candidates wear newspaper hats to prevent examination cheating



Source (W2, 2020)

Candidates wear boxes on their heads to prevent examination cheating



Source (W1, 2017)

Army recruits were asked to strip off their clothes, as a deterrent to prevent examination cheating, and appear at the examination venue in their underwear.

Figure 1: Inhumane examination conditions

In online examinations today, students and academics have been subjected to unfamiliar examination strategies. The university ICT infrastructure was not designed to accommodate online examinations. Academics were



required to redevelop assessments for an online environment and students had to cope with an unfamiliar examination strategy.

Before embarking on the online examination journey, academics in the authors' School were asked what they considered would be required for successful alternative assessments. As a result of this engagement, some of the issues that were raised are outlined in Table 1.

Table 1: A snapshot summary of alternative assessment opinions

Theme	Response	Other Concerns of academics
Plagiarism	Use of anti-plagiarism software by all students and staff	Students will need to complete a multiple choice (MCQ) exam, but there is still a risk
Technology and proctoring	Access to Microsoft Teams®, where sessions can be recorded and students have to provide a 10 minute video via Dropbox® as part of the assessment	ICT system stability is an issue, as is access by all students to a computer with a suitable internet connection
Sophisticated application of Blooms Taxonomy	If possible, require justification for MCQ answers for additional marks	
Cheating	Timed assessment	There is no way to maintain integrity – It is not possible, for example, to know if a Computer Science student gets help from an experienced programmer.
Proctoring	Skype Oral, student card verification.	Some modules are technical and venue-based is the only way to maintain the integrity

The concerns raised by academics regarding plagiarism, cheating, and proctoring of assessments displayed a distrust of their students, which is not unfounded. There appears to be an entire online industry dedicated to inappropriately assisting students. In Appendix A there are screenshots of websites and social media postings that advertise inappropriate student assistance. So, it is not unreasonable to assume that digital scholars have already begun to 'outsource' some of their learning activities, demonstrating that the intellect has become lethargic during assessments.

To develop a better understanding of students' attitudes towards online examinations, a tag cloud was developed using sentiment analysis in conjunction with Tweets. Sentiment analysis is the process of detecting positive or negative sentiment in text. The software that was used to conduct the sentiment analysis was Sentiment Viz® which was developed by the Department of Computer Science at NC State University. A tag cloud is a visual representation of words found in the text. The tag cloud in Sentiment Viz® has an x-axis going from left to right with the labels *unpleasant* to *pleasant* and a y-axis from the top to the bottom with the labels *active* to *subdued*. The tag cloud that was developed, as shown in Figure 2, shows that the word exam appears in all 4 quadrants. This is no surprise as candidates react differently to examinations (in our case online examinations).

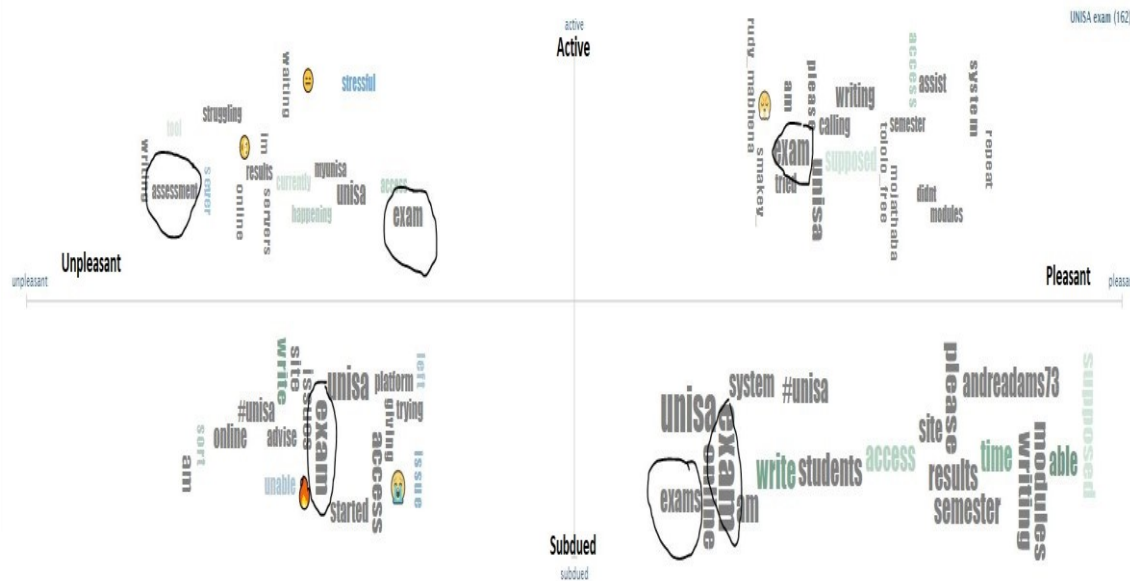


Figure 2: Sentiment Visualisation (Sentiment Tool: [https://www.csc2.ncsu.edu/faculty/healey/tweet\\_viz/tweet\\_app/](https://www.csc2.ncsu.edu/faculty/healey/tweet_viz/tweet_app/) )

### 4.3 New Challenges

Section 4.2 reflected on some of the challenges experienced in the online examination space. Within the digital scholarship space, other areas of concern have arisen in the form of the student's voice, the referral, and the professional tutor. These are outlined in Figure 3.

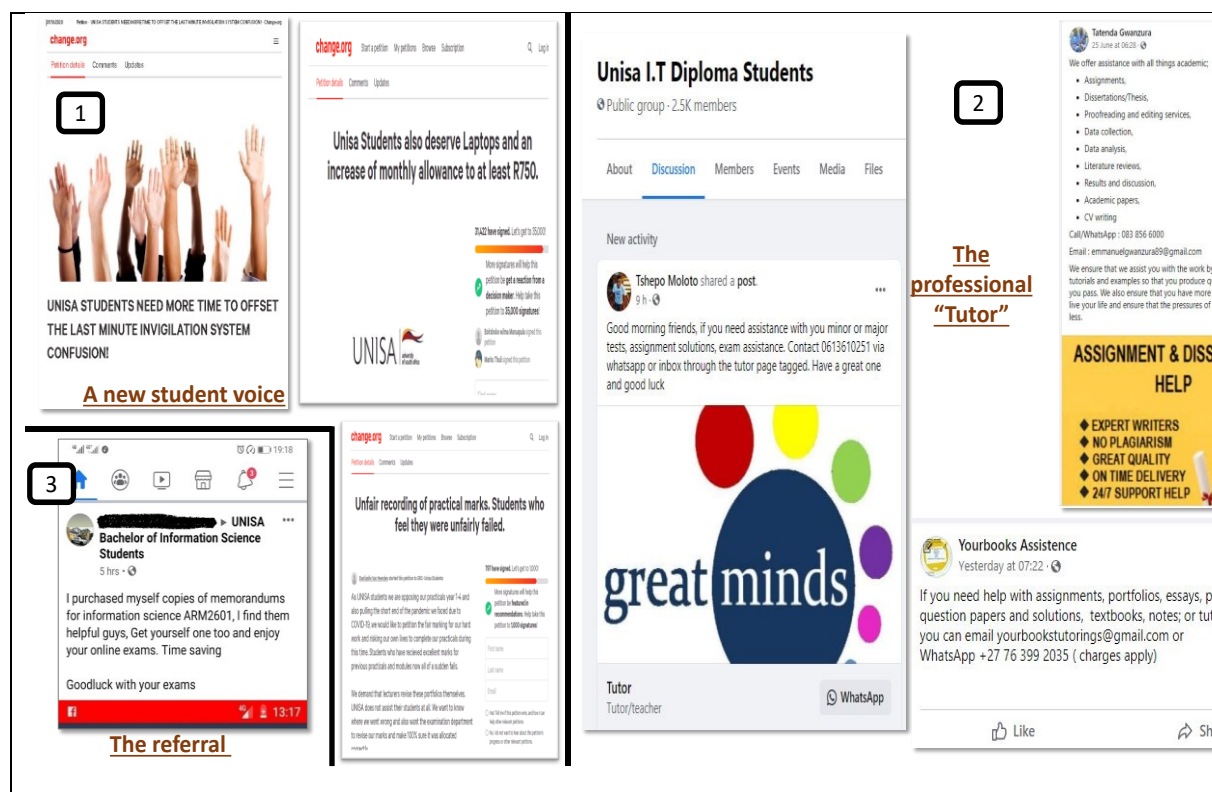


Figure 3: New areas of concern

Looking at each of these in more detail:

- **A new student voice:** Traditionally examinations used to be a closed system within the university. But now, academics face the issue that other interested groups are trying to influence the whole

examination process, one such group is the petition platform change.org. Previously, students would depend on the Student Representative Council, which was a democratically elected body, to communicate their concerns. The Student Representative Council even has representation on the university's board/council. With the use of petition platforms like change.org, the Student Representative Council has become fragmented into several smaller groups like political parties that may have competing agendas not directly related to academe. There has also been a concern raised as to who are the people signing the petitions, as there is the possibility that they are not all university students. Internal university issues have now been given an international audience.

A closer look at the services (See Figure 4) of a professional tutor reveals that the tutor will ensure that their documents are free of plagiarism and if a student contracts the professional tutor for four modules or more they will receive a discount. It is now becoming cheaper to cheat.

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Holder- False Holdings

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Branch Code - 253335

Branch Name - My Branch

Payment Reference - your name

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Proof of payment must show:

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- Account paid
- Reference

**NB: payment must reflect before we deliver the service.**

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**How we deliver?**

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**Portfolio** - We send to you the answer guide via WhatsApp not email.

**Written Exam** - when exam start download the paper and send it to me via WhatsApp and we will immediately start working on it. We will be sending you answer for each question completed such that you can have enough time to rewrite and submit.

**Multiple Choice Exam** - we can only help you if you give us your login details for the tutor to do it directly on your platform. We can't help by you sending us screenshot of questions, we are too busy for that process.

NB: each module we book a maximum of 40 students, make sure you pay to book on time.

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them a hand up. South African universities have invested significantly in technological support for candidates, but the candidates do not appear to have the appropriate skills to take advantage of this support.

The bureaucracy within the University system does not support innovation in examinations. Staff have outdated technology, university procurement is challenging, and university legal services could be paralysed by the legal implications of using technology-enhanced examinations.

Universities have a long history of operating as independent entities, so much so that they have begun to compete with each other for limited resources and candidates. There is a significant amount of duplication at universities, particularly when it comes to setting examinations. Perhaps there should be a union of universities that share the responsibility to develop high-quality assessments?

Increasingly students are seeking the assistance of “professional online tutors”, the cost-benefit of which appears to have created a market for students to cheat their way through their studies at a marginal cost. As academics, we should be asking ourselves who is really occupying our learning spaces. Is it the students? Is it the professional online tutors? or is it both the students and the professional online tutors? A further concern is, are the voices that we are hearing in our academic spaces those of our actual students or of interested sub parties that may not approve of a particular curriculum or academic.

Academics are knowledge workers and therefore it is entirely plausible for them to work from alternative spaces. However, this introduces the challenge of how or whether to invigilate examinations. Some academics have resorted to using tools such as MS Teams®, Zoom®, and Google Hangouts® to invigilate large examinations. These invigilation practices are driven by external key stakeholders who have a vested interest in the quality of the examination (engineering councils, certification boards, or professional societies). Other academics prefer using tools like Skype for one-on-one examinations, but this is not realistic for large cohorts of students. The premise is that technology will assist in reducing the tendency to cheat. In reality, however, it just introduces other challenges such as those related to the digital divide, human resource constraints, and technology challenges for candidates, academics, and the university. The result is that academics are using new technologies to mirror old practices.

Universities can be considered a trust system. The community trusts the University’s research and the graduates that it produces. However, within the university system, there is a mutual *distrust* between students and academics. Why is it that we do not trust our candidates? Why is it that we as academics spend so much time on the lower-performing student who may cheat? Should we not invest this time on the above-average student? Cheating will happen, but this is a self-correcting system as the cheaters will usually be exposed sooner or later.

Communication channels within the university during examinations have become blurred leading to catapult versus slingshot communication. With catapult communication candidates communicate directly with university top management, and vice versa, about online examination queries, bypassing departments, and academic managers. The disenfranchised academics are informed by candidates about some of the university’s decisions or via the press. With slingshot communication the student catapults an individual examination concern directly to university top management, by-passing the responsible academic and academic managers. The university top management in turn slingshots the student query to the structures below, typically: student query to principal/Vice-Chancellor, principal/Vice-Chancellor to the dean, dean to the school director, school director to the chair of the department, chair of the department to responsible academic. This ineffective type of communication creates a stressful hyper-reactive environment which is open to abuse.

With traditional examinations candidates received an examination paper and at the end of the examination, all papers were collected from the candidate. The university had a policy permitting candidates to query aspects of the examination and we as academics had a safety net to make “adjustments”. In the case of online examinations, candidates are taking screenshots of all questions. They analyse the questions and then pointedly query them and/or the marks that are awarded. It is also plausible that candidates are taking screenshots of the examination questions and sharing the questions with candidates in other countries or with candidates in different time zones.



## 6. Conclusion

The COVID-19 pandemic has brought to our attention that technology must play a greater central role in the learning journey as opposed to a supportive role, but it is also clear that technology cannot be used as a band-aid solution for replicating intellectually lethargic examination practices. We need to develop context-appropriate examination strategies for our society. Our current reality of the examination journey, as shown in Figure 3, will be characterised by social distancing, inappropriate examination venues, and hyper hygiene requirements

In a society plagued by time poverty (Walker, 2013) surely there are better ways of assessing young adults' grasp of knowledge that does not create a stressful environment.



Source (W3, 2020)

Jobseekers in South Korea undertake examinations in a football stadium to reduce the spread of COVID-19.



Source (W4, 2020)

Cleaner disinfects examination venue



Source (W5, 2020)

Candidates take outdoor examinations and maintain social distancing

Figure 3: The New Reality

Academics, in general, are overburdened with tuition obligations, academic citizenship, research, and administration. The academic space by design is a research space, where academics are first and foremost researchers and then tuition leaders. Why should academics have to become detectives to investigate cheating in undergraduate examinations? Academics are a scarce resource, whose time should be used more productively. It has been recognized that technology is evolving and so is education, but people will still cheat.

It is important to note that some students have realised that the examinations system has to evolve, and this evolution is to protect the academic integrity of the degree and the recipient of the degree, see Figure 4. While students are recognising that professional certifications are being proctored, it is only a matter of time before online proctoring will become standard practice at universities.

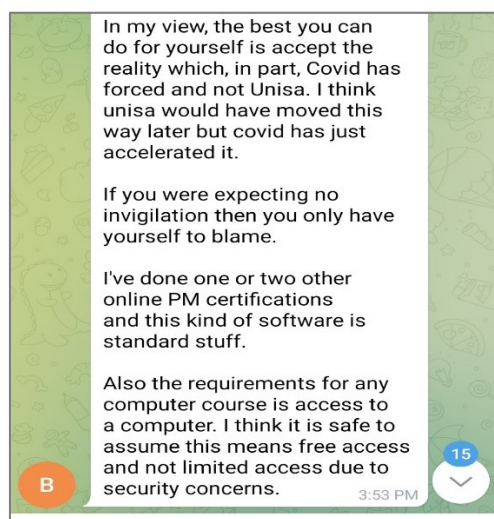


Figure 4: Student Voice

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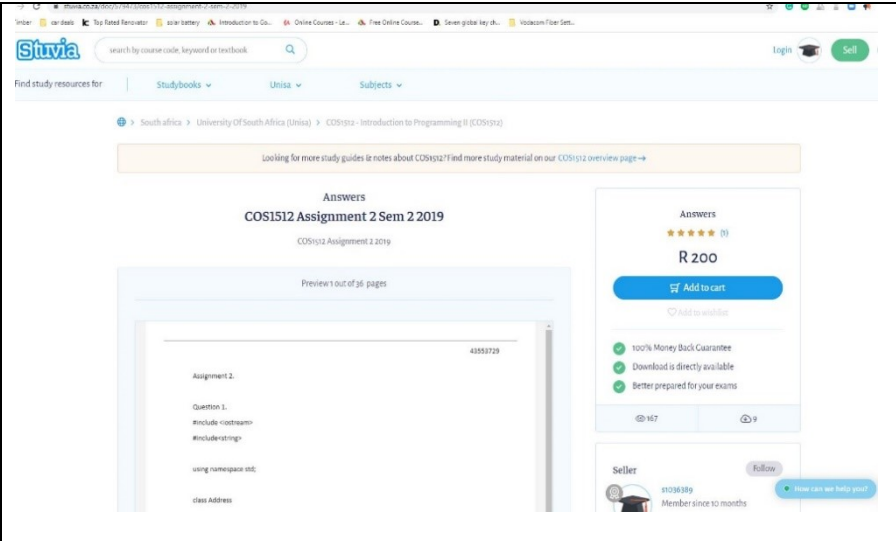
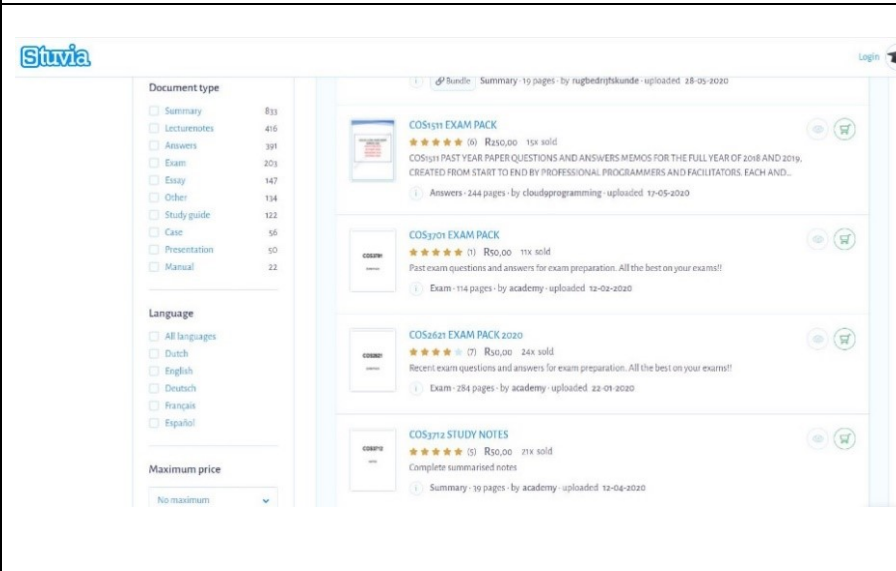
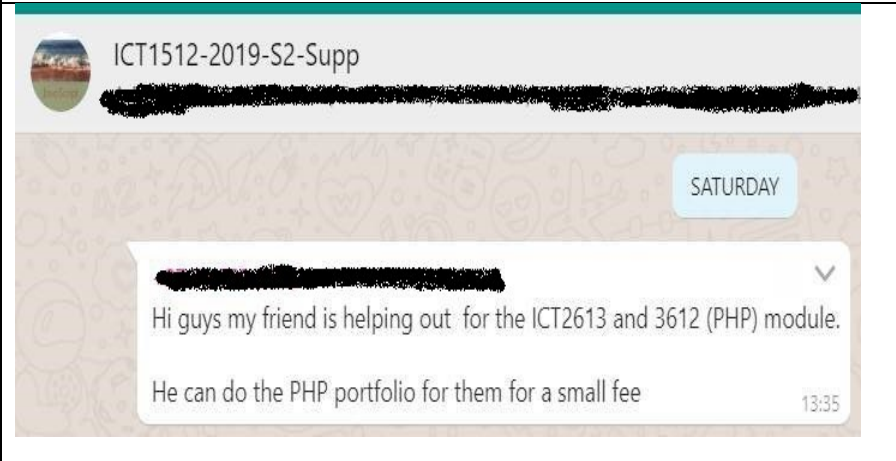
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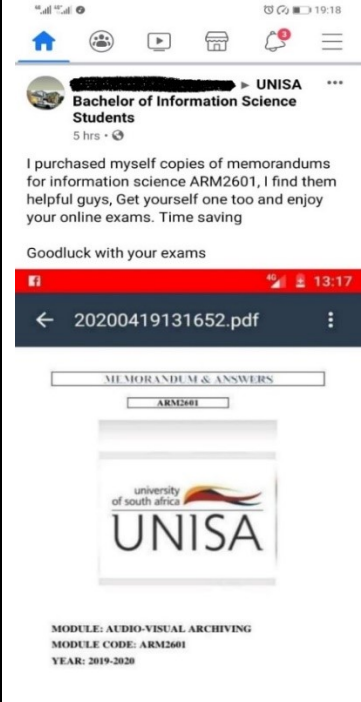
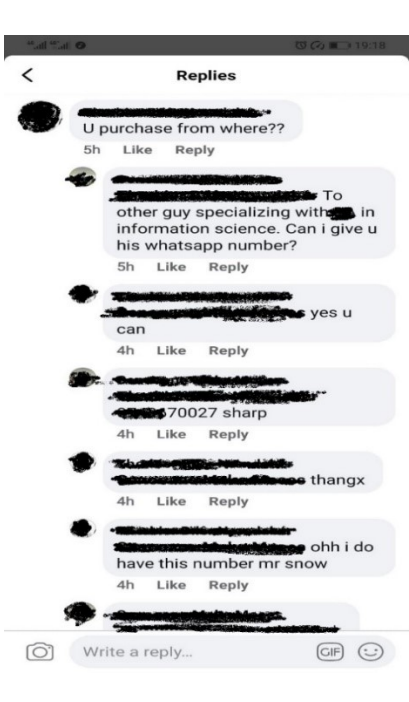
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## Appendix A

### Technology-driven cheating

	<p>A website that sells solutions (<a href="https://www.stuvia.co.za/">https://www.stuvia.co.za/</a>)</p>
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	<p>WhatsApp Cheating Group</p>



		<p>WhatsApp Group      Cheating</p>
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