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Comparison of the smart city concept: Examples from Croatia and Mauritius

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The smart city is a concept that has been around since the 1980s, but its importance and use are increasing in the 21st century. While some cities are still in the process of developing and expanding their intentions to become smart, others have already taken advantage of the opportunities offered by the concept of smart cities, creating new value for all stakeholders interacting in the ecosystems of the living city and serving as examples of best practice. The goal of a smart city is to improve the quality of life of its citizens, but also to contribute to the development of the country's economy and attract investors to invest in such smart cities. There are different concepts of smart cities and this study focused on examples of smart city best practices, their characteristics, and a comparison of smart cities from Croatia and Mauritius. The objectives of this paper are the following: a) introduction to the concept of smart cities; b) presentation of case studies of some smart cities in Croatia and Mauritius; c) analysis of the implementation and development strategy of smart cities at the national level; and finally, d) comparison of the smart city concept of Croatia and Mauritius. The idea of a smart city was developed in two phases. In the first phase of the concept's development, from 1985 to 2000, the definition of a smart city evolved simultaneously with definitions of concepts that were similar or appeared to be similar to the concept, such as a digital city, virtual city, or intelligent city. The second phase of the concept's development after 2000 is characterized by a broader meaning of the concept, but the emergence of too many definitions leads to a shift in focus away from the truly crucial aspects of a smart city (Bašić et al., 2019: 950). Smart cities are not just places with high availability of information and communication technologies, but urban areas that are successful in six dimensions: Economy, Governance, People, Environment, Mobility, and Living (Mora et al., 2017: 12). These 6 dimensions are considered as a relevant group that characterizes a smart city. They are divided into 33 relevant indicators that reflect the most important aspects of each smart dimension (Giffinger et al., 2008: 4). It is difficult to achieve that cities develop in all smart dimensions; therefore, they usually develop in the smart dimension in which they have the best chance of success. A city can be considered smart if it successfully develops only some of the six smart dimensions, but with success in additional dimensions, it approaches what a smart city really is (Tomašević, 2021). Many cities are adapting to smart technology, which consists of three parts: Information and Communication Technology, Internet of Things, and Big Data, all with the aim of developing smart applications that improve daily life. According to Mohanty et al. (2016: 14), the Internet of Things, Big Data and Information and Communication Technologies

are crucial technologies for the implementation of smart cities. The studies on the concept of smart cities in Croatia were conducted by Fojs (2020), Tomašević (2021), Jurlina Alibegović et al. (2018), and Zdjelar et al. (2016), while Allam and Newman (2018), Betcho (2016) and Maček et al. (2020) examined smart cities in Mauritius. However, none of these studies compared the smart city concept of Croatia and Mauritius. The methodology for this paper are local case studies of smart cities and country studies on the concept of smart cities. Case studies were created according to the dimensions of smart cities and their indicators and the level of adapted smart technology based on publicly available data. This study presents examples of good practices of smart cities, their characteristics, and a comparison of smart cities in Croatia and Mauritius. It was found that smart cities in Croatia are old, existing cities that are to be transformed into smart cities through various projects, investments in infrastructure, and the use of modern smart technologies, while in Mauritius the concept of developing entirely new urban units organized as smart cities to attract investors was observed. Investors in such smart cities enjoy various incentives (e.g. fiscal). The paper presents case studies of: a) the Croatian smart cities of Varaždin and Zagreb (capital); b) the Mauritius smart cities near Port Luis.

Keywords: smart city, smart city concept, Croatia, Mauritius, case study

The role of motivation in enhancing employee performance in local SMEs

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Employees are considered a key asset for any company. For any organisation to be successful it is important to ensure that they have a motivated workforce who will perform effectively in meeting deadlines and get things done properly. It is important that both new recruits and old employees feel valued and there are many ways and strategies which management can use to motivate their workforce and ensure employee performance. Elnaga and Irnran (2013) emphasise the importance of employees being the ones having the power to either destroy or build up the reputation of any organisation, impacting directly its profitability. Ahmad et al. (2012) further added that employees are the ones who help organisations to maintain a competitive edge over rival companies. Hence, this study attempts to evaluate the role of motivation in enhancing employee performance in several SMEs in Mauritius.

The objectives of the research are as follows:

- To discuss the correlation and impact intrinsic and extrinsic motivation has on an employee's performance.
- To examine the appropriate motivational measures to drive organisational performances
- To propose organisation solutions that would better motivate employees who are not performing.

In a paper by Emeka et al., (2015), the authors affirmed that the motivation of employees in a company is largely influenced by an array of factors such as job security, employee satisfaction, compensation, positive feedback as well as, intrinsic (intangible) rewards and extrinsic (tangible) rewards. Employee motivation helps in the growth of the organisation as well as the growth of the individual. Workers who find a task more intrinsically motivating will put in more effort in performing the task, just because they like the nature of the activity. Cerasoli et al. (2014), on their part, provided robust evidence of the effect of extrinsic motivation on performance, by analysing 40 years of research about the motivation-performance relation. Using a meta-analysis approach, the authors found a strong and positive association between extrinsic motivation and performance.

To meet the objectives of this research work, a mono-quantitative approach was used. Quantitative methodology, usually expressed in numbers and graphs, makes use of a structured procedure to ensure that data are collected objectively and systematically. As such, a survey questionnaire was administered to collect data from various SMEs in the country in an attempt to understand the different motivational factors affecting the performance of employees in the target companies and at the same time identify areas of improvement. The questionnaire was organised into six sections with a total of 30 questions. The majority of questions were collected either from scale or nominal data. A

total of 121 questionnaires were received back out of the 150 distributed, resulting in a response rate of 82%. The compiled data were subsequently analysed using descriptive methods and inference testing.

The results not surprisingly pinpoint that there is more male than female-led SMEs in almost all regions in the country, with 82% of respondents being male and the remaining 18% being female. It is also observed that the majority of workers employed in local SMEs are manual workers who are less educated. The inference tests on their part showed evidence that employee motivation has a significant relationship with employee performance in local SMEs; the beta-coefficient obtained through regression analysis was positive and statistically significant ($b = 0.431$, $p = 0.03$). In the same vein, the study finds that intrinsic and extrinsic motivation are also positively associated with employee performance; The spearman correlation for both was strongly positive and statistically significant ($r = 0.697$, $p = 0.054$). However, it is interesting to note the responses received that monetary compensation alone will not motivate employees as the latter tend to be intrinsically motivated. The chi-square test of independence on the relationship between rewards and employee performance turns out insignificant ($p = 0.925$) As such, the research recommends that to boost employee performance and motivation, companies need to recognise great work and celebrate results. Moreover, to make employees feel more valuable, a good working environment is needed as well as the need for a fair distribution of the workload.

Conversational artificial intelligence technology: An innovative pedagogic tool in digital education

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As conversational artificial intelligence (AI) tools like chatbots begin to cohabit with digital education technologies, concerns have been raised among educators about their ethical implications, authenticity, accuracy, and transparency (Chokri, 2023). Digital education technology encompasses a range of learning methods, such as online courses, webinars, educational applications, and digital textbooks. Chatbots are a novel technology that uses inputs, outputs, natural language processing, and response generation applications (Adamopoulou and Moussiades, 2020). Although chatbots have the potential to revolutionise digital education, they have infiltrated teaching and learning platforms without any formal assessment or evaluation, and concerns exist around their sustainability as a pedagogic tool.

This review aims to assess (1) the pedagogic role of chatbots in education, and (2) the implementation and sustainability of chatbots in the era of digital education.

There is limited local and global data on chatbot utilisation in digital education platforms or other forms of traditional learning. The existing literature on chatbots is mainly categorised thematically, with a focus on benefits/usefulness, effectiveness/safety, ethical/social considerations, and barriers to implementation. Recent literature reviews on chatbots in education suggest an emphasis on design focus (Jung et al., 2020), evaluation methods (Hobert, 2019), and larger-scale teaching scenarios (Winkler and Soellner, 2018). Additionally, design knowledge (Hobert and von Wolff, 2019), tutor similarity (Perez et al., 2020), decision tree technology (Smutny and Schreiberova, 2020), and design trends (Pérez-Marín, 2021) of chatbots for educational purposes are also presented.

A comprehensive exploration of pertinent themes including education, digital technology, artificial intelligence, and conversational artificial intelligence was conducted initially. This was subsequently refined to intersect the search criteria of 'chatbot', 'conversational artificial intelligence', 'education', and 'digital education'. Scholarly databases including Google Scholar, PubMed, Scopus, EBSCOHost, and ERIC were searched. Studies were evaluated based on their type, design, outcome measures, peer author critique, and appropriateness of conclusions, which yielded 6 systematic reviews. The search was limited to publications written in English. Articles that were not from academic peer-reviewed sources, i.e., periodicals, blogs, and grey literature, were excluded.

Three (3) different pedagogical roles for chatbots were identified from the data, viz. a supporting learning role, an assisting role, and a mentoring role (Wollny, 2021).

In the supporting learning role, chatbots were found to be used as an educational tool to teach content or skills through a fixed integration into the curriculum, such as conversation tasks (Fryer et al., 2020) or as voice assistants (Bao, 2019). Conversations with this type of chatbot aim to motivate the students to review their vocabulary, check grammar, and gain confidence in language assimilation and utilization.

In the assisting role, chatbots were found to be used to simplify students' daily tasks partly or completely. This could be achieved by making information more easily available (Suwannatee and Suwanyangyuen, 2019), or by simplifying processes through the chatbot's automation abilities (ICLIS, 2019).

In the mentoring role, chatbots could assist with students' personal development and encourage them to plan, reflect, or assess their progress on a meta-cognitive level. Chatbots could also be used to help students develop lifelong learning skills by prompting in-action reflections (Cabales, 2019).

The data is limited in that pedagogical roles were not identified in many of the publications identified. The absence of a clearly defined pedagogical role can be attributed to the more general nature of publications on chatbots, including student conversations and teachers' attitudes toward chatbot applications in classroom teaching.

Digital education in its current form has many advantages, including increased accessibility, flexibility, and affordability, and can be personalized to meet individual learning needs. The integration of chatbots into existing digital education platforms presents a novel and largely beneficial tool if attention is paid to issues such as verification of information, system design, content creation, and tutor similarity, inter alia. Further research and testing are required to give effect to its implementation, ensure its sustainability, and allay fears related to its use in digital teaching and learning platforms."

Keywords: artificial intelligence, education, digital technology

The effects of a growth mindset in South African small businesses

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This study is predicated on acknowledging that thoughts are the foundation of physical materials, and actions tend to be trailed by intent. If this is true, it is biased to account that only the extrinsic factors are the sole causality for the inadequacy of SMMEs, while retreating all individual accountability and responsibility from the owners of businesses.

This study is guided by the psychological theory based on evidence that explains human thoughts, emotions, behaviours, and ideas. The theory advances that attitudes are built and transformed based on evaluating belief systems and the need for achievements. Attaining success or growth is closely related to performance, and desire is intrinsically linked to choices. This theory is of great importance in this study regarding the consequence of willpower necessary for navigating through the adverse and ambiguous conditions prevalent in which SMMEs operate. Since people form businesses, a research study by Dweck (2014) has found that people with a growth mindset believe they are trustworthy and have a keen sense of ownership and commitment to their organisation. They are also likely to support risk-taking initiatives and more likely to foster innovation in their organisations, and see effort as a necessity. Hence, promoting a growth mindset can have a bearing on business performance Estafanous (2013), (Dweck, 2014, Mould, 2015, Miller, 2016, Kray, 2016, Lloyd, 2018, Thembekeyo, 2016).

For a long time, studies have overly emphasised extrinsic factors primarily referable to the crippling failure rate or lack of growth in the SMMEs sector. Nonetheless, there is no question as to the high rate of failure in SMMEs due to external factors. Still, there is a serious question about the amount of actual failure contributed by the “mindset” possessed by owners, managers, and inventors of SMMEs, referred to as businesspersons. The psychological theory is a good tool for this study, for it conveys deliberate desires to achieve.

The purpose of this study is to understand what personal virtues affect the growth mindset of businesspersons relating to the performance of SMMEs. Three research objectives are perused: to identify whether the growth mindset virtues of businesspersons affect the performance of SMMEs, to investigate and measure the challenges relating to the growth mindset and reinventing to the performance of SMMEs and to provide recommendations on how to enhance the performance of SMMEs.

This research was exploratory, using qualitative methods to collect and analyse data, which gave this research an interpretative character/attitude. Validation entailed online questionnaires, and in-depth open interviews to extract raw textual data focused on establishing tenets of businesspersons about business virtues. Using purposeful sampling, nine SMMEs participated in this study. Guided by an inductive approach, providing a simple, straightforward evaluation focused on deriving findings that can produce reliability.

Interviews were conducted with businesspersons from distinctive business sectors stratified by ethnicity and educational background, and the data were analysed using thematic analysis and NVivo. All participants were required to complete an online questionnaire, taking an average of 30 minutes. The interview discussion took about 30 minutes to an hour. Interviews were digitally recorded and later transcribed verbatim by computer software, then corrected before data analysis.

The study revealed that the personal virtues of SMMEs' businesspersons affect the performance of SMMEs. There is still deep-rooted silence in the field of behavioural attitude with relevance to the performance of SMMEs. The findings indicated that the high failure rate and lack of growth in SMMEs could be attributed to certain behavioural conducts and a paucity of self-imposed controls in attitudes, appetites and actions by businesspersons. Moreover, this study has shown that the growth mindset represents the spark of the human mind, symbolising the desire to expand. It revealed that businesspersons with little to no business education and mentorship struggle to grow their businesses. This study showed no justifiable evidence that ethnicity influence directly affected the growth of SMMEs. Businesspersons that actively reinvest in their interaction regarding capital, time and skills reinventing tend to recognise the needs of their business's future cash flows, which nurture growth potential and reduce the risk of failure during unfavourable economic conditions.

Based on the study's findings, it is revealed to educe from the mindset the attitude to grow businesses. The South African Government, from primary schooling and communities from early childhood, should develop the attitude of entrepreneurial character in its citizens. Support in dealing with the psychological entrepreneurial growth mental attitude could help create an atmosphere that supports a ready mindset responding to improve SMME's performance.

Keywords: Intrinsic, extrinsic, tenets, growth mindset, reinventing

Investigating the dynamics between firm's external environment and firm performance

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Small Medium Enterprises (SMEs) all over the world have proven to be the key to alleviating poverty, boosting economic growth, and positively affecting sustainable job creation. The South African government adopted various strategies in developing and promoting small businesses to accelerate SMEs to be able to boost the socio-economic outlook of the country. Even with the more focused financial and non-financial support that SMEs receive, the failure rate of SMEs in South Africa is still regarded very high. SMEs operate in both the internal and the rapidly changing external environment, which if not properly managed, like COVID-19 clearly illustrated, can affect the sustainability of their enterprises. This study focused on exploring the dynamics between the SME's external environment and their firm performance. The main objectives were to: a) Investigate Firm Performance as a construct; b) Investigate External Environment as a construct; c) Investigate and report on the relationship between their external environment and firm performance; d) Make recommendations about the training and development of SME owners. The researchers adopted a positivist research paradigm and applied a quantitative, cross-sectional, ex post factor, survey research design. A convenience sampling technique was applied, using an existing database of SMEs and possible respondents were randomly selected to complete the structured self-administered questionnaire. The collected data was statistically analysed using descriptive statistics, exploratory factor analysis. Pearson's Product-Moment Correlation was used to determine the direction and strength of the relationship between the external environment and firm performance. The following alternative hypothesis was formulated and subsequently tested: H₁ There is a significant relationship between external environment (independent variable) and firm performance (dependent variable). More than N=2000 structured self-administered questionnaires were distributed in hard copy format and n=650 were completed and collected; n= 253 were non-compliant because their business age was less than three years and incomplete and were therefore disregarded. A total of n=397 were retained for further analysis. Exploratory Factor Analysis on the external environment extracted two factors. Business acumen and the macro environment. The Business acumen score shows a significant, strong positive correlation with firm performance while the macro environment score indicates a weak positive correlation with firm performance. Therefore, an increase in the business acumen score will result in a significant strong increase in the firm performance score.

Keywords: firm performance, external environment, SME, South Africa

Climate change and its implications on agriculture: A case of small, medium, and micro enterprises (SMME) in the KwaZulu-Natal region, South Africa

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Climate change is a global problem requiring a global solution. Just as business operations are essential, it is imperative to consider the impact of climate change on business operations and the potential impacts on sustainability. Climate change has environmental, social, political, and economic repercussions. The study employs a qualitative research inquiry and uses an interview research instrument to collect data from twenty businesses in KwaZulu-Natal. The study aims to assess the causes and effects of climate change on businesses in developing regions. The study responds to “what is the cause and effects of climate change on businesses in developing regions.” question. The study hypothesised that extreme and unpredictable natural disasters such as bad weather conditions, floods, droughts, and rising sea levels are among the significant climate change challenges for business operations and have direct implications for commerce globally. The study hopes to find that climate change will have a domino effect on agricultural and production operations. For example, a reduction in the supply of agricultural products and water scarcity may lead to a reduced food supply and threatens food security. The findings of the study will provide a foundation for the capabilities and competencies businesses need to enhance their chances to survive and thrive under such conditions. The study will also influence the government to intervene with support such as funding in the case of natural disasters. Future research could look at the effects of climate change on food security and energy security.

Keywords: climate change, sustainability, developing regions, commerce

AI chatbot as a legal guidance tool

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There has been an increased investment in African health research with the aim of correcting global health inequalities. However, despite this, Africa continues to produce poor research outputs. The dearth of health research and commentary in Africa negatively impacts on the development of effective local health policies. A significant challenge to collaborative health research is the legal knowledge gap experience by health researchers and ethics committees, especially where research projects span multiple African jurisdictions. The potential role that Artificial Intelligence (AI) can play in bridging the legal-knowledge gap and streamlining legal guidance for health researchers and ethics boards demands further exploration.

A number of new data protection statutes have come into force across the African continent. The need to provide researchers with straight-forward legal guidance on how best to comply with the various data protection statutes of multiple countries is essential to removing the legal stumbling blocks currently hampering effective health research on the continent. An AI-powered chatbot, trained on relevant legal information, may provide a solution to bridge this legal knowledge gap.

We will introduce our ongoing work in developing such a legal chatbot. The legal information used has been carefully curated to ensure that only the most relevant, accurate and up-to-date sources are included. The accuracy and quality of the chatbot's responses will be carefully assessed by our trained team.

The objectives of developing the chatbot are three-fold:

1. To create a free legal-guidance chatbot trained on curated legal information, providing accurate and readily available answers to common data protection queries in health research.
2. To ascertain the effectiveness of a chatbot trained on legal information to accurately respond to legal queries; and
3. To assess the users' experience of the chatbot to determine whether a legal chatbot meets the needs of the scientific research community.

Our aim is to provide health scientists and other researchers with free, readily accessible and reliable legal guidance on areas of data protection law affecting health research. Attendees of the conference will be invited to make use of the AI-powered chatbot and provide feedback.

Keywords: Chatbot, AI, data protection, research

Challenges in inclusive social innovations for informal waste reclaimers in South Africa: Insights from a pilot study

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This paper reports on a pilot study conducted on informal waste reclaimer (waste picker) inclusion through social innovations in South Africa (SA). The integration or inclusion of waste reclaimers in the larger waste management system is proposed to improve reclaimer livelihoods (Gutberlet et al., 2020). Social innovations for informal waste reclaimers have emerged in SA to represent reclaimers and facilitate their integration as service providers into the larger municipality-wide recycling efforts (Samson, 2020). This need for representation and facilitation arises from the historical marginalisation of reclaimers (Samson, 2020). These social innovations have not been studied in-depth in South Africa at an organisational level or within the larger ecosystem, and as there is a paucity of pilot studies in qualitative research (Malmqvist et al., 2019), it is unclear from the literature what challenges may arise in such settings, and how methodologies are amended to accommodate these challenges. It is theorised that issues in communication with the waste pickers, due to differences in education levels, socio-economic backgrounds and language between the participants and researcher, may hinder data collection (Schenck and Blaauw, 2011). To assess this, Malmqvist et al. (2019, p. 1) suggest using a “carefully organized and managed pilot study” as this “has the potential to increase the quality of the research as results from such studies can inform subsequent parts of the research process”. Therefore, the aim of this pilot study is to critically assess the qualitative data collection to guide a substantive study on social innovations facilitating waste picker inclusion. This will then inform amendments in the methodology so that the data collection instruments are sound and the means of data collection are robust.

The conceptual framework used is based on the systems approaches to social and inclusive innovation devised by Foster and Heeks (2013), Avelino et al. (2019), i.e. the Ladder of Inclusive Innovation and the Transformative Social Innovation framework, respectively. These frameworks focus on multiple stakeholders, their relationships, the structures and the narratives within systems.

The pilot study was conducted with one of the four social innovation cases included in the substantive study. Semi-structured interviews were conducted with a total of 4 waste reclaimers and 2 members of management for each case ($n = 6$). The researcher transcribed the interviews and analysed the questions to determine which should be amended. The researcher also assessed how the interviews were conducted, what data could not be sufficiently ascertained from the interviews, and the involvement of translators. Lastly, the interviewer reviewed the usefulness of the data collected in the interview to identify gaps between the data collection instrument and the conceptual framework.

The findings of the pilot study suggest that communication challenges were the most significant hurdle in the qualitative data collection process, and that a greater diversity of observations and interviews with other stakeholders is needed to enrich the data. The study identified that: (1) the conceptual framework was validated, but a greater diversity of stakeholders need to be included and questions directed at engagements between these stakeholders and the social innovations were needed; (2) the credibility of the data was assured through interviewing both the waste pickers and members of management of the social innovations; (3) the researcher needed to reflect on the framing on the concept of inclusion as many waste pickers struggled with questions on inclusion and its measurement until the concept was broken down into its theoretical components of decision-making and knowledge production and exchange; (4) greater engagement with the translators beforehand could have elucidated how they would ask questions on inclusion; (5) working with translators who may also be from the organisations presents challenges to objectivity, however, the waste pickers were comfortable with translators who are familiar to them; (6) a majority of waste pickers were amenable to being interviewed after introductions were made through a liaison from the social innovation, however, gaining in-depth answers was challenging in some cases; (7) many waste pickers are itinerant, thus, it is more useful to follow them on their collection routes or go to their sorting locations, rather than expect them to come to a coordination point, however this limits the value of the observations in relation to the study.

These findings significantly guide amendments to the research protocol which will be used in the substantive study to adjust for the conditions of the waste picker operations and format the interview questions to be better understood by the waste pickers. Furthermore, these findings highlight the necessity to develop the interview questions with the translators and liaisons of the organisations. Importantly, the guidelines from this pilot study can be used by other researchers who may not be experienced in conducting informal waste picker research and who may be deterred by negative assumptions on how the research may unfold. These findings may also inform future research on marginalised and vulnerable individuals.

Keywords: waste management; qualitative research; marginalised groups; communication in research

Designing a gamified learning environment to enhance student engagement and motivation in online learning

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The traditional method of teaching in a classroom setting has become obsolete with the outbreak of the COVID-19 pandemic. With students now learning from different environments, gamification has become a popular and effective strategy for creating engaging learning experiences. Studies that focus on attitudes and characteristics of students in online learning have highlighted the issue of inadequate student engagement and motivation in the delivery of online education. In the online learning context, gamification is a strategy used to motivate and engage students. Gamification is the principle of adding game-like elements to non-game activities. According to current literature, if gamification is incorporated effectively into the lesson design, it has the potential to significantly enhance the learning experience. It is recommended to explore the gamut of gamified elements used in designing the lessons to make learning more interesting and enjoyable.

The role of motivation in shaping a learner's experience in a course is crucial, influencing factors such as persistence, level of participation, quality of work, and achievement. Despite the benefits of gamification pedagogy in motivating and engaging students, it continues to pose challenges in online learning. This study aims to fill this gap by rethinking student motivation and engagement in the context of online learning. The study identifies key components of game design that impact student behaviour in an online learning environment to bridge the existing literature gap in this area. An earlier study carried out by the authors combined quantitative and qualitative methods to analyse students' learning experiences from students' and lecturers' dimensions. The study showed that students usually miss interacting with the instructor and other students in an online class. Students did experience the feeling of being isolated. Concerning their reasons for participating in online discussions, the students were keener on earning an acceptable participating grade than in forming friendships and helping classmates. Hence, as a recommendation, gamification emerged as a promising strategy for its perceived benefits regarding motivation, engagement and learning progress.

Game elements are the toolbox for gamification and can be combined in different ways to build up any kind of game. Different mechanics and elements attract different player types. Based on the data analysis from the type of players the learners are, the game elements have been selected accordingly to cater for the different player types. Different motivational and behavioural theories are associated with varying elements of the game. The gamified learning environment in this study was designed using game elements such as narrative, progression, competition, content unlocking, leaderboard, level, points, emotions, relationships, challenge, cooperation, avatar, resource acquisition, reward, achievement, badge and feedback. This study presents the gamification process in a gamified music and movement course. An adapted D6 gamification design framework was used to gamify the course. The study was designed as a case study based on

interviews with students. Students used the gamified learning environment for fifteen weeks. The research process consisted of following phases: the design of the gamified environment, the use of the gamified environment and the determination of the students' perceptions on the game mechanics after using the gamified environment. In the analysis of data obtained in the interviews, the game elements were evaluated depending on whether students viewed them in a positive or negative way.

The outcome of the user experiences revealed that a gamified course should include the following game elements: badges and points as rewards, original narrative, levels of progression, and a reasonable complexity of the challenge. The students also encouraged well-designed content that was easy to use. However, due to its competitive nature, the leaderboard game element remains a mixed response from the students. Some valuable findings from the research are the importance of the tutor's personality in creating a fun and caring learning experience. Not only the instructor's presence in terms of continuous support and feedback but also in embodying a positive student-instructor relationship. Another element from the findings is the students' personality traits that can affect collaborative group activities. Shy students still face difficulty in participating in teamwork. However, based on the findings, whenever there was a synergy in the team, the group activities proved to build a social community and nurture a friendship among the students. To conclude, the outcome of the student's experiences with gamification in online learning showed that the students were motivated and engaged throughout the learning experience.

Keywords: online learning; gamification; motivation; engagement; learning experience

A modelling technique for evaluating the satisfaction of SADC countries citizens through the electronic government information services

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21 The purpose of this study is to determine the factors that have an impact on the level of satisfaction that citizens have with the SADC's electronic government information services. Although research has been conducted at the level of individual member states, no regional evaluation has been conducted. SADC member states are committed to achieving the goals outlined in conventions and treaties, including the use of technology to enhance the standard of living of their citizens. In order for SADC's work plan and policymakers to meet public expectations, it is crucial that they comprehend these factors. Participants hail from each of the six English-speaking SADC member states: Zimbabwe, South Africa, Namibia, Botswana, Tanzania, and Lesotho.

Citizens' satisfaction with electronic government information services is covered in the review, which contains ideas, concepts, models, and factors. Electronic governance is the delivery of government-related information and services via the internet and other digital channels [2,3]. Governments strive to provide comprehensive, pertinent, and convenient services; evaluating quality from the perspective of citizens can strengthen the citizen-government relationship [1,2].

Several models, such as SITEQUAL, SERVQUAL, EGOVSAT, ATIS, ISO/IEC 9126, and citizen satisfaction indices such as g-CSI Taiwan, EUSI, eGov-ACSI, can be used to determine the level of satisfaction with electronic government information services. Indexes of citizen satisfaction are influenced by latent factors such as perceived quality, citizen expectation, citizen gratification, citizen trust, government trust, and citizen complaint management. In these models, some of the latent variables contain manifest variables that serve as solid proxies for the latent variables [3, 4, 5, 6].

An electronic government citizen satisfaction model was created using the consumer satisfaction index modelling idea. Based on the literature, and electronic government satisfaction evaluation criteria and an electronic government citizen satisfaction index were chosen. To find a set of principles that contributes more to citizen happiness with electronic government information services, a reasonable method based on structural equation modelling and the citizen satisfaction index was utilized.

This study employed an electronic government citizen satisfaction index (CSI) model to assess citizen satisfaction with electronic government information services, based on the characteristics listed in the previous section. Even if citizens have never interacted with internet services, CSI models can directly explore how well they perform in terms of citizens' wants and expectations [7, 8]. Because it is commonly used as a quantitative

way of gauging citizen satisfaction, the research model used was chosen [9]. CSI models are well-known and have been shown to be adaptable across a variety of disciplines [10, 11, 12]. Fornell, Johnson [11], [50] used the ACSI model to examine 35 industries and more than 200 corporate entities. As a result, government CSI was chosen for this research. The research model depicts the link between the variables chosen for this investigation, as described in the previous section. In order to examine already existing methods of evaluating customer satisfaction to service offering, the researcher used a positivist research philosophy in this study. Users of selected e-governance services in SADC members aged 14 to 75 years old were interviewed

The approach for assessing citizen satisfaction with electronic government information services is based on National Customer Satisfaction Index (NCSI) models such as the American Customer Satisfaction Index (ACSI) and the European Customer Satisfaction Index (ECSI) (ECSI). This study uses an electronic government citizen satisfaction model with interaction (transaction) quality elements that operate as concrete proxies for the latent variable of perceived quality. Citizen expectation, perceived quality, citizen satisfaction, citizen complaint management, and citizen trust were identified as factors for evaluating citizen satisfaction with electronic government services [10, 13, 5, 14, 15] based on the level of electronic government maturity in the SADC area.

Utilising SmartPLS software, the Structural Equation Model-Partial Least Squares (SEM-PLS) technique is used to identify factors influencing consumer satisfaction. SEM-PLS simultaneously analyses the relationship between independent and dependent latent variables, accounting for measurement error via unobserved latent variables (LVs) [16, 17].

The findings imply that the electronic government citizen satisfaction index methodology is appropriate for assessing satisfaction not only in the SADC region, but globally. When applied to data, the model demonstrates a Goodness-of-Fit (GoF) value of 0.62 and a predictive power of 0.598. The most significant predictor of satisfaction with electronic government information services is perceived quality, followed by citizen complaints and citizen expectations. South African citizen are more satisfied with the quality of their electronic government information service than citizens in any other SADC country, which is why it came in top. In general, satisfaction was not very high in all of the countries assessed.

Journeying through the tempest: A council member's reflection on navigating stakeholder expectations and governance dilemmas in a South African TVET college

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According to McGrath et al. (2013), issues such as uneven or weak quality assurance systems, policy incoherence, complex governance, and low levels of employer participation were identified in the South African Technical and Vocational Education and Training (TVET) sector. Gewer (2016) argues that TVET colleges had to address governance issues across the sector when they migrated to the Department of Higher Education and Training (DHET) after the FET Colleges Amendment Act No. 3 of 2012. These added new emphasis and responsibilities meant increased stakeholder involvement in decision-making to ensure the relevance and effectiveness of TVET programmes (Boonzaaier, 2020). This article reflects on the governance dilemmas a TVET college council member faces while navigating stakeholder expectations and drawing on the author's experiences and insights from their involvement in college governance.

The article's objective is to reflect on the governance challenges faced by a TVET college council member while navigating stakeholder expectations and to explore the tensions and contradictions inherent in the complex web of relationships among the college's various stakeholders. The article uses a qualitative approach to identify critical themes related to balancing competing interests, promoting accountability, and maintaining institutional integrity. It offers insights and recommendations for improving governance and stakeholder engagement in TVET colleges. The article also highlights the potential value of using stakeholder theory as a lens for improving the effectiveness and impact of college governance.

There is evidence that governance in the TVET colleges has been researched, and the focus has been on specific lenses that touch on distinct aspects. One group of studies examines the governance system. These studies centre on the foundations of good governance to ensure that the core functions of the colleges are grounded on and able to operate and generate the highest possible impact for the college stakeholders. These foundations for good governance include policies, systems and engagement of stakeholders in decision-making in TVET (Apilada et al., 2012; Mende et al., 2023; Schröder, 2023; Gewer, 2016;).

A second group of studies focuses on the governance benefits, challenges, and stakeholder engagement strategies that TVET colleges have recently been experiencing (Coetzer, 2008; Moloji & Adelowotan, 2019; Mothapo, 2014; Wedekind, 2010). Boonzaaier (2020) suggest that stakeholders can participate in decision-making and other activities. However, stakeholders often work against each other and face uncertainty, posing a challenge. Boonzaaier (2020) highlights the importance of understanding the needs and interests of each stakeholder group, which forms the basis for effective communication and transparency. Balancing the conflicting demands of stakeholders is a key challenge identified by these scholars.

While the two groups of studies provide broader perspectives on stakeholder engagement and decision-making in TVET, Mokoena (2020) narrows the focus to stakeholder accountability within the TVET council. The author emphasises establishing accountability mechanisms and practices to foster transparency and effective communication between the college council and its stakeholders.

Overall, these studies contribute to the literature by highlighting the significance of stakeholder engagement and the involvement of stakeholders in decision-making processes within TVET institutions and councils. Their insights provide valuable perspectives on the benefits, challenges, and strategies associated with stakeholder engagement and accountability in the context of TVET. This study, therefore, seeks to contribute to this debate and the existing literature by providing information on navigating governance dilemmas. This includes managing conflicts among stakeholders and ensuring accountability and transparency in decision-making.

The article uses the lens of stakeholder theory. Stakeholder theory is a management theory that emphasises the importance of organisations considering the interests and needs of stakeholders such as employees, customers, suppliers, the community, and shareholders in decision-making processes. It has roots in the work of scholars such as R. Edward Freeman and has since been expanded and developed. Fundamental tenets of stakeholder theory include the strategic importance of stakeholder management, the need to create shared value, and the importance of ethical and responsible leadership. Stakeholder theory has been applied to various fields, such as corporate social responsibility, sustainability, and governance. It has been used to analyse the role of stakeholders in technical and vocational education and training (TVET) institutions in various countries.

A qualitative approach has been used, drawing on a research diary, first-hand observations recorded over five years and relevant policy and governance documents. Krishnan and Lee (2002) define diaries as first-person observations of experiences. The article identifies critical themes related to balancing competing interests, promoting accountability, and maintaining institutional integrity. Ethical considerations were also considered. Limitations include the possibility of biases, limited access to data, and the potential for the council member's experiences and perspectives to differ from the broader context.

The findings presented below are preliminary and are derived from the researcher's diary, first-hand observations obtained through active participation in council and subcommittee meetings, and observations made between 2019 and 2023.

The study findings identify challenges and complexities related to compliance with regulatory frameworks in the TVET college governance system. These challenges include the governance structure's requirements, such as the composition of the council and student representation. The existence of a one-year term of office for the Student Representative Council (SRC) presents a dilemma when these representatives also serve on the college council, which operates on a five-year term. This results in a regular rotation of SRC representatives on the council. This requires continuous familiarisation with the council's dynamics, ongoing initiatives, delays in decision-making processes, and potential disruption of cohesion and synergy among council members.

The study findings suggest a need for more diversity in decision-making processes and improved stakeholder engagement and management in TVET college governance. The CET Act prescribes that only the principal is the college council member, potentially excluding other leaders from the decision-making process. This lack of diversity impacts the quality of decisions and accountability. The findings demonstrate a need to address the policy compliance challenges. To address these challenges, it is crucial to establish a structured approach to stakeholder engagement, including clear channels of communication and coordination. This will enhance decision-making, transparency, and accountability in TVET colleges, ultimately improving the quality of education and training.

This study also highlighted that the transition period between council terms in TVET colleges creates a governance vacuum, leading to challenges and consequences for the institution. Prior to the appointment of the Council for the term under review, the college was without a functioning council for a year. Decisions were made by college management without proper oversight. One such decision was an asset acquisition without due diligence, which resulted in significant financial and operational difficulties for the college. Compliance costs were incurred, and the project had to be abandoned, leading to additional financial burdens. To address this issue, a smoother transition process and enhanced oversight during such periods are necessary to prevent governance gaps and mitigate the negative impacts of decisions made without proper council involvement.

Another notable finding pertains to the management information system at the college. The researcher observed that different committees reported different statistics on staff qualifications, which had a detrimental impact on decision-making processes. Inaccurate or inconsistent data on staff qualifications can lead to misguided conclusions and ineffective decision-making. Decisions regarding training programmes, professional development opportunities, and resource allocation may be based on flawed or incomplete information, potentially resulting in suboptimal outcomes for staff and the institution. Addressing this issue and implementing a robust and reliable management information system is crucial to ensure data-driven decision-making and enhance overall operational efficiency within the institution.

Adoption of digital systems at Ezemvelo

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The advent of COVID 19 lockdowns experienced across the world, led to transition from paper-based operations to digital operations in most organisations. This new digital era, challenges all sectors to implement changes, particularly in the hospitality and leisure sector, where employees need to maximise productivity using technology during and post lockdowns. This study aims to examine the adoption and usage of digital administrative systems and practices at KZN Ezemvelo Wildlife. The objective of the study was to determine digital administrative systems and practices used at Ezemvelo KZN Wildlife.

The literature on digital adoption and digital transformation has investigated the benefits of adoption and role of technology in various sectors. However, there is limited focus on digital administrative systems and practices in the South African tourism industry. Yet, these systems and practices can boost employee efficiency and productivity as they lead to better utilisation of time, money, resources and can contribute to improved customer satisfaction. Other benefits of adopting digitalised systems result in a paperless office, thus contributing to sustainable living. There are different types of digital administrative systems used in the hospitality and leisure industry in South Africa, thus it is crucial to study the extent of their adoption and usage.

This research adopted a quantitative approach using a census of 160 administrative employees employed at Ezemvelo. These respondents were requested to participate in an online survey. The online survey was a suitable approach during the COVID-19 lockdowns, where it was essential to reduce human contact to curb the spread of the virus. Data analysis was conducted using the Statistical Package for the Social Science Software (SPSS).

Results revealed that there is adoption and usage of administrative systems and practices by administrative employees. Interestingly, the mostly adopted system was associated with processing personal information of employees such as application for leave and receiving payslips. This implies that employees firstly adopt and use a system beneficial to them as individuals, prior to adopting those in line with the core functions of the business. Other adopted and used systems and practices are related to communication between employees, conducting meetings, processing bookings, orders, invoices and e-signatures. These systems were adopted due to their perceived ease of use and perceived usefulness as the study was premised on the Technology Acceptance Model (TAM).

The paper argues that management needs to enhance communication to employees regarding the purpose and benefits of the digital systems and practices to be adopted, in relation to the operations of the business. This is in order to promote willingness of employees to adopt and use them and to extrapolate how they can be of use towards enhancing productivity and customer service. This will help strengthen the adoption of digital administrative systems and practices and towards sustaining the use of these platforms, post the introduction of these changes.

Keywords: Adoption, Usage, Digital, Systems, Practices

Information and Communication Technology (ICT) trends, developments and innovations in the South African cannabis industry

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Cannabis industry refers to a wide range of cannabis farmers, growers and businesses involved in the cannabis value chain stages. The cannabis value chain stages include compliance and regulations, pre-cultivation, cultivation, testing, processing, manufacturing, packaging, distribution, transportation, retail, and consumption. Information and Communication Technologies (ICTs) refer to digital technologies such as computers, the internet, mobile devices, databases, telecommunication networks, and software applications to access, process, store, transmit, and communicate information. Globally, ICTs are playing an important role in the cannabis industry in various ways. This research focuses on the South African cannabis industry. The research gathers information and data from existing sources such as books, journals, websites, databases, and other published materials to provide an analysis, a synthesis, and insights on the current ICT trends, developments and innovations in the South African cannabis industry.

It is estimated that South Africa was the third largest producer of cannabis in the world in 2019. This is one of the reasons the South African government identified cannabis as one of the country's strategic sectors for development and commercialisation. In 2021, the South African government developed a National Cannabis Master Plan. The Master Plan has seven pillars. Pillar number three focuses on technology innovation, development, promotion, access, adoption, and use to support increased production, productivity and competitiveness of the South African cannabis industry. In addition, the South African government developed a national ICT strategy, in which one of the three pivotal broad strokes is 'technological advancement'. Pillar number three of the Master Plan and the third pivotal broad stroke of the national ICT strategy 'call for' research and development in various areas of ICTs. Therefore, this research paper is 'inline' with this pillar and pivotal broad stroke. While there has been some research conducted within the other pillars of the Master Plan, there is still limited research focusing on pillar number three. There is still limited research on ICTs and cannabis industry in South Africa. Hence the author decided to conduct this research in order to provide a broader perspective on the current state of ICT developments, trends and innovations in the South African cannabis industry.

The aim of this paper is to provide an analysis, a synthesis, and insights on the current ICT trends, developments and innovations in the South African cannabis industry. In order to achieve this aim, the research will cover these research questions/objectives: (i) what types and examples of ICTs have been developed for or targeted at the cannabis value chain stages in South Africa?; (ii) what are the ICT adoption patterns in the cannabis value chain stages in South Africa?; (iii) what implications can be drawn from these types and examples of ICTs and their adoption patterns in the South African context?

The descriptive research approach employed in this research paper is a mixed method (i.e. both qualitative and quantitative approach). The qualitative approach is used in the systematic review to assess written and published records as well as theme-based

scholarly publications. The mixed method is used to analyse and interpret the gathered data and information about the ICT trends, developments and innovations in the South African Cannabis industry. Tables and charts with frequencies and percentages will be used to present the findings regarding ICT trends, developments and innovations in the South African Cannabis industry. I used scholarly databases and non-scholarly databases to search for the relevant literature. The existing secondary data sources such as books, reports, conference proceedings, news, magazines, and websites are the main sources of information and data for this research. Only ICT trends, developments and innovations that fall between 2018 and 2023 will be included in this research. This criterion is informed by three factors: (i) in 2018, the South African government decriminalized the use and cultivation of cannabis in private spaces; (ii) the development of country's Cannabis Master Plan was initiated in 2019; (iii) the development of South Africa's 4IR strategy was initiated in 2019.

Outside of Africa, there is some literature about the applications, potential, role and impact of ICTs on the cannabis industry. For instance, Vernon *et al.* (2023), Nowvaratkoolchai *et al.* (2022), Abelseth (2018), and Ligaya (2017) researched the application of blockchain technology in the cannabis sector. Their findings revealed that blockchain can be used to track cannabis cultivation and sales throughout the entire supply chain. There is on-going research on the application of mobile applications, chatbots, Artificial Intelligence (AI) and Machine Learning (ML), immersive technologies, and Internet of Things (IoT) in the cannabis sector. For instance, Koss (2023) provided information about modern technological solutions ancillary to the cannabis industry along with their cannabis technological companies. For instance, Ramo *et al.* (2015) investigated the content of 59 cannabis-related mobile apps for Apple and Android devices; while Meacham *et al.* (2020) focused on investigating vaping-related mobile apps. There is a lack of research studies on the synthesis of ICT trends, innovations and development in the entire cannabis value chain (compliance and regulations, pre-cultivation, cultivation, testing, manufacturing, packaging, distribution, transportation, retail, and consumption). Some research studies only focused on ICTs and cannabis retail; while some only focused on ICTs and cannabis cultivation. In the South African context, Mbhele and Ncube Mbhele (2023) conducted a similar research study in a form of book chapter. However, their book chapter lacks a synthesis of ICT trends, development and innovations across the entire cannabis value chain. The author of this paper could not find any article or conference paper focusing on the synthesis and insights of the current ICT development, trends, and innovations in the South African cannabis industry. It is for these research gaps that the author decided to 'embark' on this research paper.

Preliminary findings reveal that various types and examples of ICTs targeted at different cannabis value chain stages exist in the country. These ICTs include online marketplaces (mobile applications and website-based platforms) targeted at retail (sale and marketing) and consumption of cannabis; mobile applications and website-based platforms for the provision of cannabis information; website-based platforms for the provision of cannabis training and skills; seed-to-sale tracking systems to ensure compliance to both local and international regulations; LED grow lights and IoT systems targeted at cannabis cultivation. It is interesting to note that online cannabis clinics through website-based systems are emerging in the country. ICT-enabled communities of cannabis enthusiasts in the form of social media pages, sharing their love and support for medical and recreational cannabis, have emerged in South Africa.

Since there is limited research on ICTs and cannabis industry in South Africa, this research contributes by providing knowledge, valuable insights, and a broader perspective on current state of ICTs and cannabis industry in the country. The research will help identify research gaps, key issues and themes, and therefore inform potential research questions for the future research. These contributions may be of importance to academics, scholars and researchers. Since the research will provide some valuable insights and also support the development of new ideas on ICTs and cannabis industry, the research may be of importance to government, and technology providers/vendors.

This research is still at the preliminary stages; hence the author has presented the preliminary literature and preliminary findings. The author will conduct further literature analysis. The author will gather more data and information on the ICT trends, developments and innovations in the South African cannabis space. This will enable the author to provide a broader perspective on current state of ICTs and cannabis industry in the country. Furthermore, this will enable the author to identify research gaps, key issues and themes, and therefore provide potential directions for the future research.

Keywords: cannabis industry; ICT; cannabis supply chain; technology; ICT trends; cannabis tech

Corporate social responsibility perceptions for Small Medium Enterprises in eThekweni Municipality

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This study examines the practices of Corporate Social Responsibility (CSR) among Small Business Enterprises (SMEs) in eThekweni, a metropolitan area in South Africa. While larger companies have been adopting CSR practices for several years, SMEs have been found to lag behind, with many citing resource limitations as the reason. However, this study argues that SMEs have a responsibility towards the communities and environment in which they operate, and should strive to incorporate innovative CSR strategies. Social responsibility has become one of the dominant themes in business over the last few years (Goss & Roberts; 2010).

Rangan, Chase and Karim (2015) point out that most companies have long practiced some form of CSR and environmental responsibility, with the main aim of contributing to the well-being of the communities and society that they affect and on which they depend. According to Vilke (2014), modern companies in a globalised world have recognised CSR as a driver of innovations. Rangan et al (2015) further state that there is an increasing pressure to dress up CSR as a business discipline and demand that every initiative delivers business results. Ramasobana and Fatoki (2014) state that it is a widely accepted and well-known fact that embarking on CSR is not only an obligation for the business, but also an important means for gaining an edge over competitors and creating a positive image of the business.

The UN Global Impact and the King IV Report have urged organizations to promote environmental responsibility and the development of environmentally friendly technologies. It is therefore imperative that SMEs in eThekweni and other developing countries adopt CSR practices as part of their business strategy. This will not only contribute to the well-being of the communities and environment in which they operate but also help to improve their business performance and sustainability in the long run. This study therefore examines Social Responsibility practice from SMEs in the eThekweni Municipal area of KwaZulu Natal province in South Africa.

In the world of business, CSR is interpreted and understood in many different ways. According to Kotler and Lee (2005), “CSR is a commitment to improve community well-being through discretionary business practices and contributions of corporate resources”. The understanding that Kotler and Lee (2005) have about CSR is also shared by Ackers (2009). The definition provided by Ackers is what European countries tend to adopt, and it is vital to understand factors such as workforce diversity, employee well-being, sustainable environment, and company operatives, which facilitate CSR activities (Baker, 2009; Matten & Moon, 2008).

In America, CSR emerged as a social and political reaction to the growth of capitalism after the American civil war (1861-5) (Bichta, 2003). In SA, the debate around the role

of CSR activity dates back to the apartheid era (Skinner & Mersham, 2008). In 1977, Rev. Leon Sullivan, an Africa-American who at the time was a board member of General Motors, developed principles that were to be adopted by US companies in SA to promote programmes that had a positive impact on non-white workers (Johnson & Turner, 2010). These principles included non-segregation in the workplace, improving the quality of life for blacks and other non-whites outside the workplace, and working towards eliminating laws that hinder social, economic and political justice (Igbanugo, 2012).

The SA government recognises the importance of CSR, which is contained in the Broad-Based Black Economic Empowerment (BBBEE) Act that was implemented in 2004 (Beenavigator, 2013; Zondi, 2014). However, various government policies and document, as well as King III, all address the need for companies to acknowledge their stakeholders and to adopt the ‘triple -bottom line’ approach. This approach focuses on the social, environmental and economic concerns of the organisation. Some scholars have further identified the three main concerns as people, plant and profit respectively (Zondi, 2014).

This study utilized a positivist philosophy to complete a descriptive research design and better understand the constructs that influence thinking around the phenomenon of SR amongst SME entities. 210 SMEs participated in the research who had been in business for five to ten years. Data was collected from them through questionnaires and analysed using Exploratory Factor Analysis. Eight factors were identified describing this phenomenon.

The results showed that SMEs in eThekweni do not prioritize CSR, with many claiming a lack of resources as the primary reason. This finding is consistent with similar studies conducted in other metropolitan areas in South Africa. This study highlights the need for SMEs in eThekweni and any other similar developing regions to incorporate innovative CSR strategies in their business practices. This can be achieved through the allocation of resources towards CSR activities and the development of partnerships with other stakeholders, including larger companies and government agencies.

Legislative initiatives in Mauritius: A critical analysis of the Quarantine Act 2020 from a Human Rights perspective

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The Coronavirus (COVID-19) disease emerged in December 2019 in Wuhan, China. Since that, no one would have expected that the World Health Organization (WHO) would declare it a “*pandemic public health menace*” (Jebril, 2020). Having over 499,758 confirmed cases and 37,593 deaths as at 30 March 2020 (WHO, 2020), governments of the world reacted through legislative initiatives that re-actualised new measures such as curfew, restriction of movement and compulsory vaccination (among others) to access countries and areas.

Mauritius is not an exception to this rule and by relying on **section 45(1)** of its Constitution, legislative initiatives such as the **Quarantine Act 2020 (Act No. 2 of 2020)** was enacted in order to overcome the prevailing situation. Nevertheless, in a post COVID-19 context, the effectiveness of this legislative initiative from a Human Rights perspective is still to be appraised.

- To review the Quarantine Act 2020 legislative initiative voted by the Parliament in Mauritius.
- To assess the awareness of the Quarantine Act 2020 in Mauritius.
- To recommend amendments to the current legal framework put in place from a Human Rights perspective.

According to the Human Rights International law, States have the duty to ensure that the protection of the rights of individuals and the community as a whole are observed and respected. In Mauritius, through its Constitution (**section 3-16**), Mauritius has ratified the provision of the Universal Declaration of Human Rights. Based on **section 45(1)** of the said Constitution, the Parliament also withholds the power of enacting laws for “*make laws for the peace, order and good government of Mauritius*” (Mauritius National Assembly, 2018).

Hence, with the emergency arising in 2020, as a means to overcome the COVID-19, the Mauritian government enacted the **Quarantine Act 2020 (Act No.2 of 2020)** to better contain the spreading of the virus. **Section 3** of the said Act granted certain powers to the Prime Minister to restrict movement of individuals in Mauritius. In the same vein, it noted that “*any breach of the Quarantine Act 2020 is punishable by a fine not exceeding 500,000 rupees and to imprisonment not exceeding 5 years*” (Office of the Commissioner of Police, 2021) and that such an offence would appear on the certificate of character of the latter, impacting on his/her ability to secure a job.

Beyond the employability impact, **section 3** of the above-mentioned Act is in itself against **section 15(1)** of the Constitution which deals with the Protection of Freedom of Movement¹; and by creating such a precedent, on what should the Mauritian citizen rely

¹ “(1) No person shall be deprived of his freedom of movement, and for the purposes of this section, that freedom means the right to move freely throughout Mauritius...”

to ensure that his fundamental human rights are protected and not superseded by an Act of Parliament?

Additionally, as per the hierarchy of laws in force in Mauritius, though considered as a primary source of law, Acts of Parliament are below the Constitution in the hierarchy and “*any other law is inconsistent with this Constitution, that other law shall, to the extent of the inconsistency, be void*”². Is the Quarantine Act 2020 then valid? Are the provisions of Chapter II of the Constitution of Mauritius³ really observed when it comes to legislative initiatives?

By adopting a socio-legal analysis, this research shall appraise law in action, and evaluate its impact over the society. Primary data will be triangulated with various sources of the Mauritian primary laws and statistics. Such an analysis will assess, among others, the impact of laws over the economic contribution; one determinant being employability in a post-COVID-19 context.

Primary data was collected through random sampling as means to assess the awareness of the Mauritian community on Human Rights concerns. The study consisted of close-ended questions and some open-ended ones relating to proposed amendments of laws currently put in place.

Based on the research conducted, the results revealed that there is a lack of awareness when it comes to the application of the provisions of the Quarantine Act 2020. A lack of awareness leading to breaches and resulting in sanctions being imposed as per Quarantine Act 2020. For example, people were left aside for a job based on the fact that the offence was recorded on the certificate of character.

Another finding revealed that the citizens were not alert of their constitutional rights and its application and infringement. As such, citizens considered only the enforcement of laws they are knowledgeable of.

The extent to which Mauritian citizens believe in the Parliament as an independent arm of the State contributing to “*good government of Mauritius*” was also conducted. The outcome was that a constitutional review is recommended as, the study also revealed that some respondents viewed politics were the real motive behind the enactment of legislative initiatives during the pandemic.

Keywords: COVID-19, Quarantine Act 2020, Human Rights, Constitution, Mauritius

² “*This Constitution is the supreme law of Mauritius and if any other law is inconsistent with this Constitution, that other law shall, to the extent of the inconsistency, be void.*”

³ Protection of Fundamental Rights and Freedoms of the Individual

Impact of the shift to e-learning and stakeholder governance in schools: A case of Mauritius

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Following the outbreak of the Covid-19 pandemic that hit the world in early 2020, education institutions that had never taken the initiative to adopt and implement e-learning suddenly started embracing e-learning technologies. This paper investigates the impact of the shift to e-learning and stakeholder governance in schools. During the Covid-19 pandemic, it was found that parents were stressed out while implementing online learning at home for their children due to the inability to offer learning guidance and health and financial challenges during the period. Therefore, the argument is that to overcome obstacles to online learning, all stakeholders must be involved in facilitating an easy shift. This study conducts a conceptual, empirical, and economic analysis of stakeholder governance and its impact on corporation performance in addressing stakeholder concerns. The study takes a mixed methods approach by adopting qualitative and quantitative techniques, such as using numerical and textual data from respondents about the research topic. Interpretivism and positivism research philosophies have been chosen to guide this study because it respects the diversity among school heads in terms of the obstacles, they experience in conducting virtual courses for effective learning and education after the Covid-19 pandemic period. A survey involving 80 secondary school heads and interview sessions lasting approximately 30-35 minutes will be conducted. A survey strategy is anticipated to aid the achievement of the study's primary objectives because it is less expensive, plus it will help in understanding this complicated societal subject and produce accurate results. Moreover, content analysis of documents such as JSTOR, ERIC, and Emerald will be conducted to provide more understanding of the topic of the study.

Keywords: Corporate governance, Stakeholder governance, competitive advantage

Climate change attitudes during Covid-19: A tale of iLembe district municipality

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The country has experienced significant climatic shocks over recent years. Water is the primary medium through which the impact of climate change is going to be felt in South Africa. As one of the world's top CO₂ emitters, this reflects a political commitment to ensuring that the country transitions to a low-carbon economy. Successfully navigating this transition will require a nuanced understanding of public opinion and behaviour, for policy processes to take account of individual preferences, concerns, and lived realities during the covid-19 period.

The COVID-19 crisis has become a reality check for climate policy and local governance. This study used political ecology theory into understanding and examine the phenomenon of climate change and considered the link between governance. This was highlighted in order to reveal the missing mechanisms of governance that would help public organizations and other stakeholders to take on joint responsibility for the impacts of climate change because it is a long-term problem. The study also focused on the relationship between beliefs about climate change, concerns about climate change, and personal norms and efficacy beliefs. Pro-climate change behaviours must be approached as something that people see value in and automatically respond to. The objective of the study is **to** examine the attitudes and perceptions held by the community in Noodsburg towards climate change and its impact during the COVID-19 period. Stern (2016) has identified climate change as one of the two pressing issues facing humans: poverty. Stern (2016) points out that there is a considerable risk for a safe and thriving world in the future if these two issues are not addressed adequately and quickly.

In 2015, the 2030 Agenda for Sustainable Development was adopted by all United Nations member states. This provides a blueprint for peace and prosperity for people and the planet, currently and into the future. At the centre of the Agenda are 17 Sustainable Development Goals (SDGs), which set out the path to achieving a better and more sustainable future for all. Two of the SDGs that are particularly relevant for this study are goal six and goal 13. Goal six of the 17 SDGs focuses explicitly on freshwater, including Sustainable Development (SDG six): *“Ensure availability and sustainable management of water and sanitation for all.”* Goal six, in particular, calls for improving water quality and protecting and restoring water-related ecosystems (Hering, Maag & Schnoor, 2016). Goal 13: *“Climate action- Take urgent action to combat climate change and its impacts.”* This highlights the impact that climate change has globally on weather patterns, which are changing, sea levels are rising, weather events are becoming more extreme, and greenhouse gas emissions are at their highest levels in history. The goal calls for immediate action.

According to Water-U. N's (2018) synthesis report, the 2030 Agenda lists rising inequalities, natural resource depletion, environmental degradation, and climate change among the most significant challenges of our time.

An investigation of climate change attitudes of residents in Noodsburg, Ilembe district municipality served as a departure point from which to critically examine the governance around water. The study employed a qualitative research design. The study worked with a purposive non-probability sample technique because it seeks to obtain insights into climate change attitudes that exist in iLembe District during the COVID-19 pandemic. New data on this topic was collected via focus groups which consisted of South Africans 18 years and older living in Ward 6 Noodsburg. The researcher and the team conducted three focus groups consisting of five community leaders and members in each group of the community in ward six, Noodsburg, iLembe District. A pre-designed focus group interview schedule was used. Face-to-face semi-structured interviews were conducted with Ilembe District municipality officials in the environmental and planning units. These key stakeholders are knowledgeable about the iLembe District Municipality and work on the ground with the ward committee members in the local government sector as well as environmental issues.

The study provides insights into the understanding of Noodsburg community members' attitudes towards climate change. The findings revealed that the community members in Noodsburg identified a range of expected adverse effects over the coming decades, particularly environmental impacts such as water shortages, drought, food shortages and higher temperatures. These findings have relevance to climate change communication in the country and matter for ongoing policy interventions that are striving to minimise the human development consequences of climate change and COVID-19. The study concludes with a discussion of the implications of these findings for crafting effective climate change frameworks and policy interventions in South Africa in the coming years.

Keywords: Local ecological knowledge, climate change, political ecology, COVID-19, public perceptions

Trade and investment promotion in South African provinces: A case study of trade and investment KwaZulu-Natal

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Using Trade and Investment KwaZulu-Natal (TIZN), an investment promotion agency (IPA), this study evaluated how governance and effective trade and investment promotion policy implementation could enhance trade and investment and address socioeconomic challenges in South African provinces, with particular reference to TIKZN. The paper drew on qualitative data sources such as interviews and focus group discussions and reviewed secondary sources.

The paper reveals that even though trade and investment promotion is known to play a significant role in any country's economic growth, South African provinces are still faced with persisting socioeconomic challenges despite the strategies and policies in place to promote trade and investment.

The paper argues that the cause of this is ineffective policy formulation and implementation, which fail to address the problem. It also illustrates the manner in which IPA agencies are governed, which does not encourage and encompass new governance principles of collaborative governance; thus, IPAs are seen as formulating and implementing trade and investment policies without the views and contributions of other stakeholders.

The insights and outcomes gleaned from this paper have underlying implications for South African IPAs, with particular reference to TIKZ and policymakers alike. Therefore, there is a need to rethink and remodel the whole governance system adopted and used by the South African IPAs and other similar institutions.

The study paper should provide a new perspective on how developing economies, such as South Africa, should formulate and implement trade and investment promotion policies and the manner in which IPAs should be governed in order to be able to address socioeconomic challenges that continue to persist.

The implication of this is that there is a need for South African provinces to treat trade and investment promotion as crucial to address socioeconomic challenges. This can be achieved only if policies are formulated and implemented correctly with the involvement of all stakeholders, and the manner in which IPAs are governed has an influence on attracting foreign investments. If left unmonitored, this has the potential to further lead to an inability to attract and promote international trade and foreign investment.

Keywords: trade and investment, policy formulation and implementation, governance

Sustainable development goals

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Sustainable Development Goals (SDGs) are a universal framework adopted by all the United Nations Member states in 2015 as a global call to action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity. The SDG consists of 17 interconnected goals and 169 targets covering a wide range of issues including poverty, hunger, health, education, gender equality, clean water and sanitation, affordable and clean energy, economic growth, industry innovation and infrastructure, reduced inequalities, sustainable cities, and communities, responsible consumption and production, climate action, life below water, life on land, peace, justice, and strong institutions, and partnerships for the goals. The SDGs apply to all countries, regardless of their level of development. Implementing the SDGs requires mobilizing all stakeholders, including governments, civil society, the private sector, and the international community. It also requires transformative changes in the way we produce and consume goods and services, the way we govern ourselves, and the way we interact with the environment. Achieving the SDGs by 2030 is a daunting challenge, but it is also an opportunity to build a more equitable, sustainable, and resilient world. This requires innovative and integrated approaches that address the root causes of poverty and inequality, promote social inclusion and gender equality, protect the environment and natural resources, and foster economic growth and innovation. The SDGs emphasize the importance of social inclusion, gender equality, and reducing inequalities to ensure that the benefits of development are enjoyed by all segments of society. They encourage policy coherence and the breaking down of traditional silos, fostering a more holistic and sustainable approach to decision-making. The purpose of this paper is to highlight the importance of the SDGs as a framework for sustainable development and to provide an overview of the challenges and opportunities associated with their implementation. It also emphasizes the need for multi-stakeholder partnerships, evidence-based policies, and participatory approaches to ensure that no one is left behind in the pursuit of a better world for all.

Keywords: Sustainable Development Goals, United Nations, Multi-stakeholder partnerships, innovation

Investigating the dynamics between firm's external environment and firm performance

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Small Medium Enterprises (SMEs) all over the world have proven to be the key to alleviating poverty, boosting economic growth, and positively affecting sustainable job creation. The South African government adopted various strategies in developing and promoting small businesses to accelerate SMEs to be able to boost the socio-economic outlook of the country. Even with the more focused financial and non-financial support that SMEs receive, the failure rate of SMEs in South Africa is still regarded very high. SMEs operate in both the internal and the rapidly changing external environment, which if not properly managed, like COVID-19 clearly illustrated, can affect the sustainability of their enterprises. This study focused on exploring the dynamics between the SME's external environment and their firm performance. The main objectives were to: a) Investigate Firm Performance as a construct; b) Investigate External Environment as a construct; c) Investigate and report on the relationship between their external environment and firm performance; d) Make recommendations about the training and development of SME owners. The researchers adopted a positivist research paradigm and applied a quantitative, cross-sectional, ex post factor, survey research design. A convenience sampling technique was applied, using an existing database of SMEs and possible respondents were randomly selected to complete the structured self-administered questionnaire. The collected data was statistically analysed using descriptive statistics, exploratory factor analysis. Pearson's Product-Moment Correlation was used to determine the direction and strength of the relationship between the external environment and firm performance. The following alternative hypothesis was formulated and subsequently tested: H₁ There is a significant relationship between external environment (independent variable) and firm performance (dependent variable). More than N=2000 structured self-administered questionnaires were distributed in hard copy format and n=650 were completed and collected; n= 253 were non-compliant because their business age was less than three years and incomplete and were therefore disregarded. A total of n=397 were retained for further analysis. Exploratory Factor Analysis on the external environment extracted two factors. Business acumen and the macro environment. The Business acumen score shows a significant, strong positive correlation with firm performance while the macro environment score indicates a weak positive correlation with firm performance. Therefore, an increase in the business acumen score will result in a significant strong increase in the firm performance score.

Keywords: firm performance, external environment, SME, South Africa

The impact of disruptions on the operations and performance of the Durban Port

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The Durban Port is one of the largest and busiest seaports in Africa – it plays a significant role in the South African economy. However, the port has been experiencing disruptions that affect its operations and performance, for example, labour strikes, COVID-19 and the heavy rains in KwaZulu-Natal during April 2022

The main aim of this paper was to explore the disruptions experienced by the Durban port and their impact on its operations and performance, and find out what strategies the port has in place to mitigate these disruptions. This is an exploratory and qualitative study. Primary data was collected through semi-structured interviews with 11 participants at the Durban Port. A non-probability, judgmental sampling method was used to select the participants. Data was analysed using thematic analysis.

The findings reveal that technical failures, labour strikes, bad weather conditions, security threats, government regulations, and congestion at the port are disruptions that affect the Durban Port's operations and performance. They resulted in decreased revenue, higher costs, interrupted and delayed cargo. Mitigation strategies to address these disruptions include and improvement in information technology, increased collaboration between employees and improved communication and training. Recommendations are presented in this paper suggest that if Durban Port wants to remain competitive, serious intervention is needed to improve and expand infrastructure, improve security, and implement and develop technologies and train existing employees to improve their skills and ensure that going forward, appropriately qualified and skilled persons are appointed.

Keywords: disruptions, operations, performance, mitigation strategies, Durban Port, Transnet SOC Ltd

Strengthening pathways towards sustainable development with a societal convergence towards customer centricity

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Governments play a role in shaping the way forward for integrated ideas that result in sustainable change for people. In recent years, new and complex challenges have emerged and considering perennial issues such as unemployment at extreme levels, there still exists a clear gap between the services that government provides and the needs of citizens. The creative economy has the potential to generate knowledge through innovation, which can be viewed as the fastest growing business in the world. Public value can thus be enhanced through a greater understanding of citizens' needs and experiences. This study introduced design thinking that adds another dimension to understanding the personal challenges that people encounter in order for more suitable solutions to be developed by government departments.

Exploring new avenues for the delivery of improved public sector value to citizens by creating new value with innovation.

Sustainable development policy has highlighted the innovation economy as an important constituent in generating added value (Szopik-Depczyńska et al., 2018). Innovation is understood to be a key factor in employment growth and economic growth, which impacts on improving the living standards of people (Ioppolo, Cucurachi, Salomone, Saija and Shi, 2016). Governments can view the people they serve, such as citizens and businesses, as their customers. A customer centric strategy delivers an improved performance as the customer benefits from superior service and the organization benefits as it creates value in a unique way (Hemel and Rademakers, 2016). One of the best ways to ensure a customer centric strategy is to facilitate innovation with design thinking (Naiman, 2019).

The presence of innovation unlocks new pathways for improved efficiencies and makes life better and easier. Thus, innovation should be understood not in the context of technology, rather it be understood in its simplest form as anything that brings new meaning and new value. An important consideration is that innovation should be thought of as the entire process of innovating, as well as the outcome (Kahn, 2018). Design thinking, as a strategic tool with which to conceptualize innovations, has attracted widespread interest as an effective innovation approach due to its user-orientation approach, which can be seen in incremental changes that improve the livelihoods of people.

This study was conducted at a Municipality in South Africa. Purposive sampling was used to select participants. The inclusion criteria for the participants included senior staff members with more than five years of experience. These participants would have a good understanding of how the public sector has been operating as well as have been actively engaged in activities. The qualitative data was collected during face-to-face interviews. Prior to each interview the researcher asked each participant to reflect on their work environment in terms of the way they carry out their work activities. Participants were then asked ten pre – determined questions that were semi – structured and in context of the reflection. The results were coded using NVIVO and analysed using thematic analysis.

Innovation was associated by the participants with cost-effectiveness and sustainability, as it is about doing *“things faster, smarter and more efficiently”* (Participant 8). In the context of sustainable development, participants alluded to the different dimensions of development, where innovation plays, or can play, an important role within the municipality.

“Currently, sustainable development initiatives are a bit piecemeal. There are initiatives but they are a bit in pieces, but there are organisational requirements that try and pull them all together.” (Participant 10).

Whilst there are noticeable efforts, a participant reported that innovation efforts are not really going anywhere. *“I think that innovation is a brilliant concept. There is a lot of exciting things that we are doing with industry and pushing in that direction; but I think internally, while there are debates, regarding that I don’t think we are getting anywhere fast.”* (Participant 3).

Participants shared their experiences of the constraints faced by the municipality regarding the use of innovation in the municipality. These include a low tolerance for risk; ambiguity and uncertainty; bureaucracy; lack of capacity; slow progress; working in silos, and the lack of a clear innovation strategy.

Barriers for women in IT positions in SA

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The under-representation of women in senior and leadership positions in the IT industry has long been an issue of concern for both organisations and governments and is gaining global attention. In South Africa we have seen efforts such as employment equality acts by government and diversity programmes by organisations that aim to address this under-representation.

The findings of this study may assist learners and university students by providing them with valuable information to inform their career choices. By making the social and structural barriers to women's entrance, persistence, and advancement in IT positions visible, this study can provide women with situational knowledge that is useful to overcome these barriers. Likewise, knowledge of structural and cultural enablers will assist IT female professionals to advance their careers. This knowledge enables businesses to nurture and support women in IT roles, and hence create an environment of ease and acceptance for women where they can thrive and succeed.

This study aims to understand the barriers that women encounter in their career journeys and the enablers that helped them overcome the barriers as they persist and advance in IT. This research considers barriers and enablers experienced by women in IT senior positions in South Africa during different career stages namely, when choosing an IT career, persisting in IT and advancing in the IT profession.

South Africa currently faces a shortage of female professionals who are skilled in IT, E-Commerce, and Computer Science. Comparisons between South Africa and other developing countries like Ghana, Brazil, Mexico and India show that the country has made just a 2.3 % increase in female leaders since 2014. A common problem is that the number of women in IT positions continues to decrease. This limits their professional input, specifically reducing the diversification of products and services provided by the IT sector. While men are expected to pursue more masculine career paths such as bricklaying and Computer Engineering, the IT career may seem less attractive to women, due to work-family conflict.

The participation of women in the workforce creates gender diversity. In the IT industry diverse teams perform better and are more innovative. Globally females continue to be under-represented in leadership positions, despite research that shows that companies that have female leadership continue to do much better. Women tend to support employees and pick up additional responsibilities above their standard responsibilities, increasing the value to the company and improving the organisational culture around them. The perceptions young girls have of the IT occupational culture play a significant role in their decision to pursue IT careers or, as young IT female professionals', whether they choose to persist in IT careers or not. The IT setting at

universities might find students working late into the night on IT projects which leads them to assume that this reflects the work culture they should expect when they start their careers in IT.

A qualitative approach was used due to its ability to provide comprehensive, detailed interpretations, and richer insights. Open-ended online interviews were used for data production using a sample of fifteen female senior IT managers. This sample consisted of Chief Information Officers (CIOs), Heads of Department, and different IT managers in their areas of specialisation within IT.

The results of this study showed that factors such as computer access at a young age played an important role in creating a positive attitude towards computer related careers. Factors such as the availability of bursaries for IT qualifications and family members' knowledge about IT careers were most likely to increase the chances of a young woman choosing an IT career. The results also showed that young women who liked Science, Technology, Engineering, and Mathematics (STEM) subjects were also more likely to study computer related qualifications. The IT industry career path and the support employees received from family and organisations also played a big role in determining the persistence of women in an IT career. Furthermore, mentorship and sharing of opportunities within professional networks contributed positively to the advancement of women in this industry. The flexibility and ability to work from home were among the highlighted benefits that encouraged women to persist. Results also showed that more women were concentrated in middle management and that the career path to the C-suite level is not clear. Based on the participants of this study it is evident that disabled women are equally able to succeed in an IT career with appropriate support and opportunities.

In the conference presentation these research findings will be theoretically located within Ahuja's (2002) model of social and structural determinants of women's careers in IT. This allows the results of this study to contribute to the existing body of knowledge in this area.

Keywords: Women, IT, Senior, Career, Barrier

Examining the awareness of customer satisfaction with artificial intelligence (AI) chatbot interactions in the Ghanaian insurance industry: A case study of Star Assurance Ltd

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The aim of this study is to examine the awareness of customer satisfaction with Artificial intelligence (AI) chatbot interactions in the Ghanaian insurance industry using Star Assurance ltd as the case study. The fascinating use of AI chatbots in the insurance industry is to assist customers online, particularly those from other countries, and to consider the vast distances and wide variations in cultures, languages, and expectations that these customers have. A quantitative data collection approach was adopted to gather data from 111 respondents. The findings of the study indicated a high level of awareness of AI and use of chatbots among respondents, as well as a strong and statistically significant relationship between AI chatbots and customer service delivery (CSD). Nonetheless, the research also uncovered several customer-related challenges in using AI chatbots, such as misinterpretation of inquiries or input, task assistance failure, redundant questioning or responding, inappropriate or awkward replies, unwarranted contact, actions or content, and monotony. The study recommended that Star assurance needs to invest in ongoing improvements and enhancements to the capabilities and user experience of the chatbots which involve incorporating more advanced AI technologies, such as natural language processing and machine learning, to improve the accuracy and effectiveness.

Keywords: Artificial intelligence chatbots, Customer service delivery, insurance industry, Emerging technology, Insurance companies

The management of digital education (blended learning) as a pedagogical tool within a South African independent school

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In keeping with United Nations sustainable development goals (UNESCO, 2021), many approaches have been adopted in the contemporary classroom. One of the approaches that has been receiving much attention is blended learning. Blended learning combines face to face instruction with technology to improve the learning process (Caird and Roy, 2019) The traditional classroom environment is under transition and there is a need to revisit the role of both the teacher and the student. Blended learning studies have been limited to a few institutions or in different countries with differing demographics. This being the case, this study focused on how a South African Independent school with a unique set of characteristics has responded to the use of blended learning. The review of an independent school provides an interesting juxtaposition to non-independent schools with little or no access to online and blended learning. The study sought to understand the current digital education and blended learning pedagogical tools that are being implemented within the curriculum at a South African Independent School. This was extended to an understanding of the current and broader schooling environment in South Africa. Also, why the implementation of online learning resonates in a particular manner within independent schools and how this may or may not be relevant in a non-independent school context)

Since digital education forms the overall umbrella under which blended learning falls, the conceptual model of blended learning espoused by Risdianto (2019) forms the theoretical framing of this study. This author suggests that blended learning may be an appropriate way to extend learning time so that the students can achieve standards of readiness in college and the world of work. It is also seen as an appropriate way to cover up learning that cannot be done in a face-to-face environment. Blended learning could also make it easier to monitor student progress.

The research design used, was qualitative and is placed in the interpretivist research paradigm. Interpretivism is focused on how people understand their experiences These unique experiences help uncover a depth of meaning and differing interpretations that the various participants may hold. A non-probability purposive sampling technique was used to extract the sample. The sample size included five principals, the one academic deputy at each campus, 6 curriculum leaders per core subject (English, Afrikaans, isiZulu, Mathematics, Mathematical Literacy and Life Orientation) at each of the five campuses, as well as the academic strategist at ADvTECH. Therefore, 41 respondents was included in the study. Interviews were conducted with the 5 principals and the 5 academic deputy principals per campus, as well as the academic strategist. These individuals formed the senior management team at the independent school. Thereafter, 5 focus group interviews for the 6 core subject curriculum leaders at each campus was conducted. The rationale for selecting the core subject curriculum leaders is that these subjects are compulsory from Grade 8 - 12, and as such the curriculum leaders engage with the entire student population

daily. As a result, their insight and reflections would be more representative of the entire student population.

It is anticipated that the academic management and curriculum advisors have divergent views on the adoption and implementation of online and blended learning. It would also be anticipated that the use of online and blended learning may not be seen in the context of the SDG goals for those that implement the curriculum, but rather a reactive response to an uncontrollable variable and circumstance. Whilst the importance of it would be acknowledged, they may not be able to see the direct link to their actual work context. However, there would be shared problems in terms of online teaching such as internet connection, access to the internet and students' perceptions of online and blended learning. These findings can then be extended to the non-independent schooling sector to identify what may be relevant in different schooling backgrounds.

Keywords: online blended learning; sustainable development goals; digital pedagogy, academic curriculum management

Youth and sustainable rural livelihoods in South Africa: Challenges and opportunities

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The notion of sustainable livelihoods remains a topic of interest for researchers, academics and policy makers in many countries, South Africa included. This notion is undoubtedly very popular in the development debate. In the recent decades, the interest of researchers has been drawn to sustainable livelihoods in rural contexts. While youth are recognised as key players in the development of their countries, evidence regarding their contribution to sustainable rural livelihoods is inconclusive. Thus, the purpose of this paper is to analyse the contribution of youth towards sustainable rural livelihoods in South Africa. This study adopted a qualitative approach to address its purpose and secondary data sources were used to inform this study. The results indicate that the livelihoods of rural youth themselves are unsustainable in South Africa. Accordingly, the contribution of rural youth to sustainable livelihoods of rural households and communities is limited due to several youth challenges. These challenges include high levels of unemployment, illiteracy, and alcohol and substance abuse. Thus, many young people in South Africa remain a burden in rural households and communities as opposed to being contributors to sustainable livelihoods.

Keywords: Communities, Households, South Africa, Sustainable rural livelihoods, Youth

Fostering resilience through emotional intelligence in an academic environment

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Covid-19 evoked a wide range of emotions as people struggle to cope with its effect on the normal way of life. The Future of Jobs Report by The World Economic Forum (2020) ranks emotional intelligence in the top 15 in-demand skills to trend in 2025 onwards. Given the evolving situation of Covid-19 and the limited research on how university academics can use emotional intelligence to build resilience to cope with the emotional ramifications like Covid-19, this research would be beneficial to higher education institutions at large, in aiding academics in dealing with the ramifications of the pandemic or adversity. A quantitative approach was implemented using stratified simple random sampling. A sample of 360 university academics from a population of 11325 was drawn from 5 campus sites in a South African higher education institution. The findings revealed that there is a significant relationship between emotional intelligence and the resilience of university academics. Amongst others, respondents outlined that self-care and meditation are skills that are needed to build resilience for thriving during adversity. Additionally, the majority of the respondents felt that there was an absence of well thought out strategies supported by empirical backing from the human resources division during the Covid era.

Keywords: academics, adversity, emotional intelligence, higher education, resilience

Investigating the obstacles to cloud computing adoption in the health sector: A case study of selected public and private health centres in Ghana

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The aim of this study was to investigate the obstacles to the adoption of cloud computing in both public and private health centres in Ghana. Despite the potential benefits of cloud computing, such as cost-effectiveness, scalability, and accessibility, the health sector in Ghana seems to face obstacles that hinder its adoption. Therefore, the study seeks to identify the obstacles to cloud computing adoption in Ghana's health sector. The study adopted a mixed method approach to gather data from respondents. A questionnaire was used to collect data from 76 employees and semi structured interview was conducted for 10 experts to gain in-depth understanding. The study found that the major organisational obstacles faced by health centres in adopting cloud computing included a lack of technology expertise in cloud computing, the high cost of internet and Information Technology (IT) equipment, and a lack of top management support. The study also revealed that the technological factors impeding cloud computing adoption included security and privacy concerns, the availability of internet to access the cloud, and compatibility challenges with existing IT equipment. A recommended was for key personnel to recognise the intrinsic risk associated with cloud computing adoption to mitigate these risks on user side.

Keywords: Cloud computing, technology adoption, Public and private health centres, privacy, internet, security

Digital entrepreneurship in the 4th Industrial Revolution and beyond

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The nature of the confusion that underpins entrepreneurial processes and outcomes and the strategies for addressing it has changed due to the fourth industrial revolution brought about by the development of digital technologies. Technology is the main force behind digital entrepreneurship. The fourth industrial revolution's technological development is both a limitation and a turning point for digital entrepreneurship. Most importantly, it has been assumed that the fourth industrial revolution will provide additional drivers for the future of digital entrepreneurship. The fourth industrial revolution is receiving much attention from society. Still, very limited research has been done on digital entrepreneurs' opportunities, obstacles, and success factors during and after this transformation concerning Covid-19. The purpose of this paper was to compile the most recent research on digital entrepreneurship, investigate how the fourth industrial revolution's digital transformation has affected this field, and explore how the Covid-19 pandemic has affected it. An evidence-based literature review on digital entrepreneurship was conducted by conducting a systematic search and review of journal articles, book editions, statutory publications, and other government documentation. A qualitative analysis research method was used for this study. Content analysis is the type of research analysis that was used. The information collected from journals, articles, books, and other sources was analyzed and organized to allow the researcher to identify patterns and develop new ideas. The study found that digital businesses were unaffected because they were already familiar with digital methods of operation and their business model. Covid-19 benefited digital entrepreneurs by allowing them to quickly and effectively pivot to a new market and segment. However, Covid-19 also posed a threat to the survival of the businesses as it disrupted their business model and disrupted their supply chain. Digital entrepreneurship in the 4th Industrial Revolution is promising to look beyond. In response to COVID-19, numerous digital technologies are being used.

Keywords: Digital, Entrepreneurship, Technologies, Transformation, Covid-19

Fourth Industrial Revolution (4IR): Survival skills for the South African job market

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In a rapidly developing world, the future of work is ever-changing, with the fourth industrial revolution (4IR) well underway. The paper used a systematic literature review methodology to explore the ‘future of work’ in South Africa, focusing on the skills for 4IR, examining the 4IR impact on the South African job market and investigating ways to help the country stay ahead of the curve. The findings showed that 4IR skills include skills like creativity, critical thinking, and communication. The findings also reveal that 4IR has a massive impact on the South African job market, as numerous jobs are at risk of becoming obsolete due to advanced 4IR technologies. These 4IR technologies are also expected to create new job opportunities. However, such opportunities will benefit those with the necessary 4IR skills.

This study provides a greater understanding of the skills required for the 4IR, which is important because the 4IR will likely create many new jobs requiring new skills. The South African government has acknowledged the possible effects of the 4IR in the country; hence, the establishment of the National Skills Fund (NSF) provides funding for initiatives focusing on developing South Africans’ skills (NSF, 2019). Furthermore, the government created the National Skills Development Plan (NSDP), which “seeks to ensure that South Africa has adequate, appropriate and high-quality skills that contribute towards economic growth, employment creation and social development.” (Department of Higher Education and Training 2019, p. 11). Hence, this study will provide valuable insights into skills that the NSF and NSDP will have to focus on in terms of funding to ensure the employability of South Africans under the 4IR.

1. To identify the skills required for the 4IR.
2. To examine how 4IR will impact the South African job market.
3. To investigate ways to equip South Africans with the necessary skills for 4IR.

This study follows a thematic review approach to synthesize the findings of the existing literature on the skills required for the 4IR and how they will impact the South African job market. 4IR is still an ongoing phenomenon, and the skills necessary for it are not yet fully known. However, as it is dubbed the ‘technological’ revolution, it is without a doubt that it will require a lot of technical skills with a higher level of digital literacy and a greater ability to use data and analytics. Additionally, Magwentshu et al. (2019) suggested that technology-enabled jobs will be in demand and require higher-skilled personnel compared to other jobs. Furthermore, it is expected that in South Africa, one in three jobs of the 5.7 million low-skill jobs will likely be automated (Dijkman, 2023; Rapanyane & Sethole, 2020).

Investment in learning and skills development is necessary to ensure that everyone is competitive in the labour market (Anakpo & Kollamparambil, 2021). One way to ensure South Africans have the skills required for 4IR is to invest in skills development (Abuselidze & Zoidze, 2023). Hence, South African academic institutions play a vital role in this regard, as they are uniquely positioned to provide these skills.

The search strategy for this systematic literature review involved searching for studies in peer-reviewed journals relevant to the research objectives. In particular, the following databases were explored: Google Scholar, Science Direct, and EBSCOhost. The PRISMA model was used in selecting relevant articles. Inclusion and exclusion criteria were applied.

The skills required for the 4IR are not only technical, but also social and emotional. These skills can be divided into three categories: technical, soft, and adaptability. 'Technical or digital' skills are those that are specific to a particular job or industry, such as computer science. These skills are often acquired through formal training and education and are required for jobs involving technology, which 4IR is all about. Followed by 'soft' skills, referred to as 'human' skills by World Economic Forum (2018), these skills are not specific to any one job or industry, such as critical thinking and analysis. As the 4IR progress, it will become more and more important to be able to think critically and analytically. With so much data and information available, people will need to be able to go through it and understand it; this will require thinking logically, figuring out patterns, and coming to conclusions. Such skills are often related to personal attributes and interpersonal skills. They are essential for jobs that require working with people and for managing change. Then there are 'adaptability' skills, and these are traits that enable people to adapt to new situations and learn new skills quickly.

Keywords: fourth industrial revolution (4IR) skills, South African job market

Operational resilience during coronavirus disease on total quality management in textile multinational companies

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This paper aims to investigate the impact of the coronavirus disease (COVID-19) on operational resilience and total quality management (TQM) practices in multinational textile companies. The scope of the study encompasses the challenges faced by the textile industry during the pandemic and how these challenges affected the implementation of TQM principles. The research focuses on multinational companies in the textile sector, considering their size, geographical diversity, and global supply chains. The paper concludes that the COVID-19 pandemic significantly disrupted the operational resilience of textile multinational companies and posed challenges to their TQM practices. The sudden disruptions in supply chains, labour shortages, and restrictions on mobility resulted in production delays, increased costs, and compromised product quality. However, the study also highlights the resilience strategies adopted by these companies to mitigate the impact of the pandemic. These strategies included the implementation of agile supply chain management, remote working, digitalization, and increased collaboration with suppliers and customers.

Keywords: Operational resilience, Total Quality Management, COVID-19

A model to assess building big data capability

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This research investigates the potential of big data organisational capability to address fact-checking and combating false information in news media. The media and data sharing services are grappling with fake news and public mistrust. Big data innovation has the potential to provide much-needed intervention, but some myths need to be dispelled, such as the notion that data analysis alone can ensure transparency and reliable content distribution. This study employed the Digital Data Genesis Capability (DDGC) model to review the implementation of a big data capability in the media fact-checking sector to determine its appropriateness as a guide for capability development.

The study focuses on a specific big data implementation: The Dexter project. The research objectives are driven by the variables and stages of the model: To determine

- the relationship between the Dexter project's big data capability (stage 1) and the digital knowledge strategy used for monitoring the factual quality of digital media.
- how the Dexter project produces the output (stage 2) used by strategy makers (stage 3) to safeguard the factual quality of digital media.
- the Dexter project's big data capability's (stages 1 to 3) influence on the performance of fact-checking.

A critical review of recent studies and online research libraries was conducted. Online research libraries from Google Scholar, Springer, Science Direct, IEEE Xplore, and ACM library, were used. The global rise of misinformation due to increased connectivity and news media technology is discussed. The literature on open-source architecture for big data analytics and changes in the media world caused by big data analytics are also considered.

A 2017 study found that factors such as novelty of information, negative-toned news, and news with limited characters (like tweets) increased the spread on social media. The researchers used text mining, machine learning, and econometric models to identify the factors that drive the virality of news and misinformation. A key recommendation of the study was the need to build theoretical research on big data driven implementations. This suggestion, supported by other authors, is the primary motivation for this study.

Prescott's (2016) Digital Data Genesis Generation Capability model provides a theoretical approach to the development of technical, infrastructural, big data capability along with the necessary data, people, and strategies, to optimise its application to societal issues. It, however, has not been applied in a range of business sectors, to verify its broader applicability.

The DDGC model combines a resource-based view and a dynamic capability view of the big data process. The resource-based view focuses on resources that are valuable, rare, and difficult to imitate perfectly, but which can be easily leveraged by a company to

achieve its goals. The dynamic capability view, focuses on the company’s routines and ability to respond to changes in the business environment. This approach is intended to make the system highly adaptable to changes in the operational environment as the organisation responds by using the existing capabilities and routines to establish the required new capabilities.

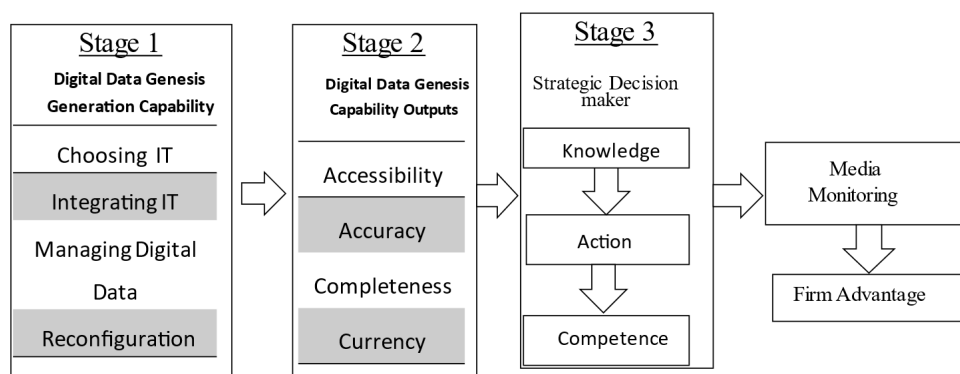


Figure 1: Digital Data Genesis Capability Model.

The study employed a qualitative case study analysis of the Dexter platform (Durban, KwaZulu-Natal, South Africa). The data for the study consisted of in-depth interviews with participants involved in the development and daily use and analysis of the output. The interview questions focused on the variables of the model and the relationships in the model. Interview transcripts were thematically analysed using NVivo.

The findings suggest that highly skilled employees with expertise in both proprietary and open-source tools are crucial for developing effective big data systems (stage 1). To ensure a feasible strategy that can deliver the necessary outputs (stage 2), the study highlights the importance of compatibility with existing web standards and tools when deploying to ensure responsiveness and agility. The model was most efficient in exploring the backend construct i.e., the backend and front development of the system (stage 3). Implementing a big data workflow is complex and requires careful planning; the use of cloud computing services for hardware, software, and outsourced third-party services; as well as in-house data structure development and the use of docker containers. The case study identified key performance indicators such as the speed of the system; user friendly user interface; changing and evolving roles; and responsibilities of staff members (stage 3). The study further notes a deviation from the existing DDGC model. It illustrates how big data initiatives can be implemented by multiple companies in partnership if they operate in the same business sector; have similar business traits; and share the same philosophy towards big data management (Stage 3). Overall, this research emphasizes the value of the model as an explanatory and analytical tool and extends our understanding by showing how businesses can successfully choose to collaborate to develop big data capability.

Keywords: big data, docker containers, cloud computing

The influence of the Covid-19 pandemic on the professional identities of health care workers

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The health care profession has been labelled as a high-risk profession owing to the various occupational dangers it experiences. As a result of this, this profession requires a robust professional identity. However, identity is fluid and for individuals in health care, their professional identity is continuously changing. One factor that has influenced professional identity was the Coronavirus pandemic (Covid-19). The spread of this virus created a global health emergency. With its unique and unprecedented conditions, substantial changes had occurred, of which influenced the professional identity of health care workers. Professional identity is a key component of identity was studied under the novel influence of Covid-19 in Pietermaritzburg, South Africa.

Based on structuration and positioning theories, the purpose of this paper was to answer the question: how has the Covid-19 pandemic influenced the professional identity of health care workers? During the Covid-19 pandemic, health care professionals found themselves in inherently demanding positions of managing this health emergency. Their daily routines changed, and there were concerns of one's role, work effectiveness, limitations and vulnerabilities. There is a gap between the accelerated change in environment of health care and the uncertain nature of Covid-19. Therefore, the rationale behind is study was to gain insight into this disorientated environment.

The objective of this paper was to investigate the professional identity of health care workers in Pietermaritzburg, KwaZulu-Natal, South Africa during the Covid-19 pandemic.

Literature across disciplines provided a myriad of discussions into identity formation. One pathway is that of professional identity. Professional identity is a substantial catalyst that influences one's career, their workplace performance, attitudes, and behaviours that are within and beyond workspaces (Porter & Wilton, 2019). For individuals in health care, their professional identity is in constant reconstruction, as it is easily influenced by many factors (Sheng, Zhang, Wang & Cai, 2020). With the novel and sudden impact of the Covid-19 pandemic, this profession faced many physical and psychological challenges. As an example, nursing professionals were exposed to a larger risk of poor mental health, they were positioned in new roles and conducted tasks that were previously not practiced and beyond their scope (Liu, Luo, Haase, Guo, Wang, Liu, Xia, Liu, Yang & Yang, 2020). With this, a new working environment was created that these professionals found themselves immersed in. This made health care workers more sensitive to the influence of the pandemic than other professions. Given the formation of this new working space, and the influence that the pandemic could have in altering ones' professional identity, created new interest. At this stage it remained unclear as to what

was already known about the pandemic and how it affected professional identity, and within this basis, the motivation for this study was constructed.

The methodology applied was qualitative. Six individuals participated in sixty minute individual semi-structured interviews. Participants who met the inclusion criteria of the study participated. The lived experiences of health care workers and their professional identity was studied through phenomenology. This provided an opportunity to understand the thoughts, emotions, memory, and perceptions of the participants. An inductive approach was applied to generate theory and compare and challenge it to the existing literature and theory that was used.

Primary data was collected from individual semi-structured interviews. Interview questions consisted of open-ended and probing questions. Research participants were interviewed at their workplace (a tertiary hospital situated in Pietermaritzburg).

Three themes emerged from this study. These themes were; the front-line worker, Covid-19 and the workplace and professional strain and identity management. During the pandemic health care workers questioned their identities. This was because of fear, panic, and burnout experienced from the pandemic. Social and structural factors also affected their identities. However, although they mentally, physically, and emotionally strained, they found comfort in each other as health care workers and were able to re-establish their professional identities during uncertain times.

Although multiple studies have aimed to understand the impact of the pandemic on individuals and institutions, few have focused on the impact of the pandemic on health care workers and their professional identity. Therefore, this study filled a gap that was believed to be missing. Through uncertainty health care professionals had questioned their identities, and their vulnerabilities weakened their professional identity. To provide for the development and sustainment of professional identities for health care workers, it is recommended that supportive practices be implemented to personal, social, and professional identities. This will safeguard the development of identities during uncertain conditions.

Keywords: Professional identity, Pandemic, Health care profession, South Africa

Cybersecurity in developing countries: A case of South African Small-Medium Enterprises (SMEs)

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Research suggests that cybersecurity in Small-Medium Enterprises (SMEs) in South Africa, is inadequate. Cybersecurity has been identified as a major security problem, which Small-Medium Enterprises face in South Africa. South Africa focuses on providing cybersecurity to many large enterprises. Government should also provide Small-Medium Enterprises with some degree of cybersecurity. This study focuses on improving cybersecurity in SMEs and enhancing cybersecurity in enterprises. A systematic literature review was used as the research methodology to conduct this research. This research aims to make Small-Medium Enterprises aware of the importance of cybersecurity and the risks and/or threats they may face. Some of the findings suggest that ransomware and malicious software are some of the most significant risks and threats that SMEs encounter. Their information systems are vulnerable due to poor infrastructure and poor finances.

One of the main issues that SMEs face is that their information systems are frequently attacked and their data/information is threatened. This issue causes a negative impact, as this sometimes leads to the SME being forced to shut down or result in being financially constrained. The study aims to enlighten SMEs on the various cyber-attacks that they can become a victim of, so that they may reduce the risks of such threats and attacks. A lack of knowledge or affordability of cybersecurity makes SMEs in South Africa most vulnerable to cyber-attacks. System damage, financial information theft, and compromised data may result from cyber-attacks (Malumo, ND).

1. To identify the common risks and cybersecurity threats that affects SMEs in South Africa.
2. To investigate the strategies used by SMEs to examine risks and threats related to cybersecurity.

Studies have shown that SMEs in South Africa need more cybersecurity management, as developing countries are often ignorant of the various cyber-security threats that exist and the strategies that can be used to examine and prevent cyber-attacks. Nauman et al. (2020) have shown that many large organizations have cybersecurity management and cybersecurity protocols in place. Many organizations experience challenges that consider reputation, business operations, compliance, and financial matters in the context of cybersecurity. These cybersecurity attacks drastically affect organizations (Nauman et al., 2020).

Belli (2021) speaks of the South African government's significant concern about cyber threats. The government acknowledges that security breaches and mitigation have individual, governmental, and international implications. The main threats of cybersecurity include physical threats, human threats, communication and data threats, and active threats. These are the most common threats that occur when handling an

information system. The attacker will use these forms to try and get information or damage the data stored in the information system (Belli, 2021).

This research was conducted using a systematic literature review, which aims to synthesize the findings of existing research, which are related to the research objectives of the study. The work is interpreted and analysed by breaking it down and studying its constituent parts. As a result, it is subjective writing of many studies to decide the best way to answer the research questions created. According to Melnikovas (2018), this methodology will include an interpretivism philosophy that interprets previous studies and has an induction approach. This research methodology contains four phases, each of which has stages within them, that is, planning, selection, extraction and execution.

There exists a vast range of cybersecurity threats that affect SMEs in south Africa. These include:

- Data spillage, malicious emails, lost or stolen devices, website infringements, USB incidents, and denial-of-service attacks are the main cybercrimes occur within organizations (Pate-Cornell and Kuypers,2021).
- Data breaches, data destructions, and refusal of data access which are considered the most critical cyberattacks (Alahmari and Duncan, 2020).
- Ransomware is an extremely dangerous attack, which is done mainly through phishing and spamming (Haddad and Binder, 2019; White et al., 2020)
- Formjacking is harmful in ways of stealing credit card information and many other user details (Tam et al., 2021).
- Says that ransomware phishing, malware, and social engineering are some of the dangerous forms in which an attacker can get what they want from the information system (Du Toit et al., 2018; Wylde et al., 2022).

Several researchers believe that the NIST CSF framework will be able to handle all cybersecurity matters within the information system; however, the system will only need one framework (Benz and Chatterjee, 2020; Gordon et al., 2020; Gourisetti et al., 2020; Roy, 2020; Japs, 2021).

Keywords: Small-Medium Enterprises, Cybersecurity, South Africa

How students view the role of Information and Communication Technology (ICTs) in enhancing their academic performance

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Educational stakeholders have recognized the potential of Information and Communication Technology (ICTs) to enhance students' academic performance, leading to substantial investments in technology for teaching and learning purposes. While previous studies have explored the benefits and drawbacks of using ICTs in education, little research has been conducted on the actual influences of ICTs on students' academic performance. The COVID-19 pandemic has emphasised the importance of remote learning and the critical role of ICTs in facilitating this transition. To address this gap, this study utilised a structured questionnaire with a quantitative approach to gather data from students enrolled in tertiary institutions during the 2020-2021 academic year. The study was guided by the Technology Acceptance Model (TAM) framework, which focuses on students' acceptance of ICTs for teaching and learning in South African tertiary institutions, and their subsequent influence on academic performance. The data was analysed using Google Forms, and the findings indicate that ICTs do improve students' academic performance.

In education, the term ICT, which stands for Information and Communication Technology, is employed with varying connotations compared to its broader application in other settings (Zuppo, 2012). Nonetheless, regardless of the context, the fundamental definition of ICT revolves around technological devices and network infrastructure that enable the transmission of diverse information across digital platforms and digital competencies. While utilizing technology in education presents both advantages and disadvantages, research conducted in this study reveals that technology can effectively enhance the process of teaching and learning (Lee *et al.*, 2018). However, there has been limited research conducted on the impact of ICTs on academic performance. This study specifically aimed to investigate this aspect.

The primary objective of incorporating ICTs in teaching and learning is to support and enhance the experiences of students and academic instructors, who play a crucial role in creating pedagogical environments. The researcher aimed to address existing gaps in the literature concerning the impact of ICTs on academic performance and contribute to this field of study. The available literature on the effects of ICTs on teaching and learning is relatively extensive, and overall, it seems to support the notion that students find ICTs highly beneficial in assisting them with various academic tasks like assignments and research. (Parrish, 2016; Dintoe, 2018; Mir & Shakeel, 2019; Ishaq *et al.*, 2020). However, one of the goals of this study was to determine whether the existing published studies offer corroborating evidence for claims or counterclaims regarding the impact of

ICTs on students' academic performance. Additionally, the study sought to identify which devices have the potential to assist students in enhancing their academic performance.

The objective of this study were to examine the impact of ICTs on student academic performance, compare the effectiveness of previous, current, and future ICTs in supporting student performance, utilize the collected data to evaluate the influence of ICTs in educational institutions, provide assistance to students by examining existing literature and identifying best practices from around the world that can be applied in the South African context, and investigate how students access and utilize ICTs both at home and in school.

Over the past two decades, ICTs have revolutionized various industries, including medicine, banking, education, tourism, and information technology, significantly transforming conventional practices. In particular, the field of ICTs has brought about substantial changes in the teaching and learning sector, modernizing traditional approaches. However, the degree of progress or transformation in the education field resulting from the integration of ICTs has not reached the same level as seen in other industries (Dintoe, 2018). As a consequence of this lack of improvement, the education industry has encountered various factors that impede its progress. A study carried out in developing countries such as Bangladesh and Indonesia discovered that students in tertiary institutions and colleges extensively employ ICTs in their learning activities (Ullah *et al.*, 2019). Nevertheless, the study revealed that excessive access or reliance on these ICTs had a negative impact on students' academic performance. Additionally, within the same study, 80% of the respondents disagreed with the notion that ICTs contributed to enhancing student academic performance (Ullah *et al.*, 2019).

Tertiary institutions should enhance their technology infrastructure to incorporate ICTs, thereby facilitating students' preparedness for remote learning, online certifications, and courses (Humbhi and Tareen, 2021). In 2019, the outbreak of the global pandemic, Covid-19, necessitated the implementation of lockdown measures across countries, leading to the closure of schools as a preventive measure to curb the spread of the virus (WHO, 2020). In order to prevent the loss of the academic year, numerous institutions, including schools and tertiary education providers, adopted online remote learning.

This study employed a deductive approach and followed a quantitative research design. The sample consisted of students who were enrolled in a tertiary institution during the 2020-2021 period. Purposeful sampling was employed in this study to select respondents who were students registered for a qualification at the tertiary institution. Purposeful sampling is a technique in which the researcher deliberately chooses participants who meet specific criteria that align with the study's objectives (Benoot, Hannes & Bilsen, 2016). The study employed purposeful sampling, taking into account the ages and educational levels of the students. A total of 168 students participated in the study by responding to the distributed survey. The population group for this study consisted of tertiary institution students who were enrolled in their studies during the year when the survey was conducted. To collect data, a questionnaire was created using Google Forms and shared with potential respondents through social media platforms like WhatsApp, LinkedIn, and Facebook. Descriptive statistics were utilized to analyze the collected data. The study presented its findings by examining the theory using logical reasoning, numerical data, and statistical tools such as tables, figures, and bar graphs.

The study employed an exploratory and descriptive research design, aiming to delve deeply into the research aspect. Students who met the criteria for inclusion in the study were identified as the respondents within tertiary institutions. In order to accomplish the goal of exploratory research, the study aimed to thoroughly investigate the research topic (Fleming and Zegwaard, 2018). The utilization of an exploratory, descriptive research design encompasses two categories: exploratory research design and descriptive research design. Firstly, according to Burns and Santally (2019), exploratory research design is characterized as research conducted to gain new insights, discover innovative ideas, and expand the understanding of a particular phenomenon. Secondly, the purpose of a descriptive research design is to provide a depiction of a situation, individual, or event, or to illustrate the relationships between various elements as they naturally occur. This study specifically aimed to accomplish these objectives. Both exploratory and descriptive research designs rely on a crucial element: data collection.

The study employed the purposive sampling technique to select specific respondents who met certain criteria to participate. The criteria included being a registered student in a tertiary institution and being 18 years of age or older. Purposive sampling involves making deliberate decisions to define or categorize the membership of a "representative" sample based on identifiable characteristics. This approach facilitated the targeted selection of respondents, allowing for the collection of their responses through a constructed questionnaire in the data gathering process (Gentles *et al.*, 2015). A respondent is specifically chosen using the purposive sampling technique, also known as judgment sampling, based on the attributes they possess (Richmond, 2016). It is a non-random method that does not require it (Todd, 2017).

The distribution of the survey was carried out using a structured questionnaire created on Google Forms. A link to the survey was shared with potential respondents through various social media and multi-platforms such as LinkedIn, WhatsApp, and Facebook. An electronic survey has the advantage of wide coverage across different internet-connected platforms, enabling access to a large number of respondents. This was particularly valuable for this study as it allowed for reaching respondents irrespective of geographical limitations imposed by the Covid-19 lockdown restrictions. However, due to the lockdown measures, it was not possible to distribute paper-based questionnaires to respondents who lacked internet access or technological devices. Consequently, these individuals were excluded from the study. The questionnaire provided clear instructions on who should participate, along with comprehensive information on ethical considerations, non-disclosure, anonymity, and confidentiality. Out of the distributed survey, a total of 184 individuals responded. However, 16 students did not complete the survey, leading to their incomplete responses being excluded from the study. Therefore, the final sample size included 168 students who completed the survey. There were 168 valid respondents that were utilised for data analysis and there were 91 female and 77 male students. The consent form did not explicitly indicate that only South African students can participate as it was not required in this study and no question indicated that they should enter their tertiary institution name for the researcher to determine their country of origin. The questionnaire was distributed to students through social media platforms that relatively had students that were registered at South African tertiary institutions. The population was gathered by asking students to share the questionnaire link with their respective tertiary institution's academic groups. Without any evidence to

the contrary, it was assumed that only South African tertiary institution students participated in the survey in terms of demographics.

The choice of data analysis approaches relies on the research objectives and the intended purpose of the data, such as hypothesis testing. (Oberhuber and Maurer, 2019). Data analysis entails examining the raw data as a resource for a study, with the aim of identifying statistical significance in terms of trends, patterns, correlations, statistical hypothesis testing, and relationships (Mwapwele et al., 2019). In the discussion of the findings, it is essential to interpret and explain the statistical analysis results that confirm the significance of trends, patterns, correlations, and relationships (Kaur, Stoltzfus and Yellapu, 2018) Furthermore, the study can be analyzed by considering measures such as the mean, average, median, and mode. Additionally, the spread of variable values can be described in terms of range, frequency, and variance (Tobias and Trindade, 2020). According to Ullah et al., (201), descriptive statistics have the potential to make complex concepts more comprehensible by visualizing data sets. In a study, the main objective of descriptive statistics is to summarize numerical data and present it in a visual format that can be easily communicated (Todd, 2017) Moreover, it is important to note that descriptive statistics can provide reports and summaries of the data set, but they cannot generate claims or draw conclusions that exceed what the data itself allows or supports (Loeb *et al.*, 2017) Consequently, the collected data was subjected to descriptive analysis techniques, and the outcomes of this analysis were conveyed through the use of graphs, charts, and tables. The data was exported to MS Excel for additional analysis, allowing for the presentation of the findings in a graphical and tabular format.

The collected data underwent descriptive analysis techniques, and the resulting findings are presented in tabular format. Through personal experiences, the respondents in this study developed their own perspectives on the academic advantages and disadvantages of teaching and learning, particularly in relation to their academic performance. This aspect of depending on remote ICT-based online and contact teaching and learning provided a valuable and informative resource. In exploring the students' experiences to uncover unexplored aspects, the researcher found that the TAM (Technology Acceptance Model) theoretical framework was suitable for this study, as it helps understand the effects of ICTs on student academic performance. The TAM theoretical framework does not aim to validate any assumed hypothesized relationship between ICT dependency, proficiency, ease of adoption, and academic performance in remote or online teaching and learning. However, it did assist in identifying the external variables influencing the adoption and proficiency of ICTs in teaching and learning. Thus, the utilization of the TAM theoretical framework was justified, particularly in relation to the behavioral responses involved in the adoption of ICTs in tertiary institutions. The data obtained from the survey validated the TAM theoretical framework's applicability to the adoption and proficiency of ICT utilization in hybrid teaching and learning.

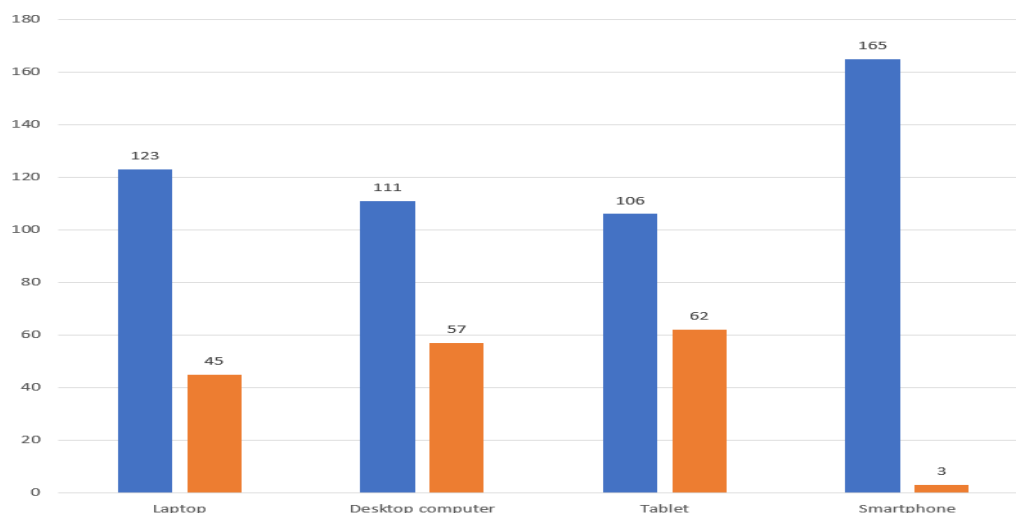


Figure 1: Technological devices used by students to access the Internet

In this study, Figure 1 reveals that the majority of the students participated by owning a "Smartphone," with 165 students confirming their possession, while only 3 students indicated not having one. The research also found that 57 students did not have access to "Desktop Computers" for academic purposes, and 62 students did not have access to "Tablets." The second most commonly utilized device for academic tasks was laptops, with 123 students affirming their use of laptops to access the Internet for their academic work. Consequently, it is crucial to recognize that Internet access plays a vital role as a critical success factor (CSF) in enabling students to accomplish their academic tasks. When students effectively and efficiently employ the Internet and information and communication technologies (ICTs) for academic purposes, they can develop and acquire essential skills and knowledge to tackle intricate problems and create innovative solutions. These opportunities and improvements can greatly enhance student academic performance. Therefore, it is important to acknowledge that Internet connectivity and technological devices capable of connecting to the Internet should be considered as critical success factors (CSFs).

Table 1: The extent to which ICTs influence students' academic performance

	To no extent	Small extent	Moderate extent	Large extent	Very large extent
Technological devices improve my grades or marks.	1	8	12	25	122
I can effectively do my online assessments.	4	6	8	79	71
Technological devices help me understand and do more research through YouTube, Google Scholar, etc.	4	7	4	72	81
I can keep my academic life and social media platforms separate at home.	4	24	15	70	55
Technological devices help with my studies.	0	7	10	71	80
Wi-Fi connectivity can hinder my studies.	11	16	8	64	69
Total	24	68	57	381	478

In these findings, the researcher opted to discover the percentages of the findings by the researcher utilized a specific approach to determine the percentages of the findings. To calculate the final results, the responses for "Very Large extent" and "Large extent"

were combined and divided by the total number of respondents (168). This value was then multiplied by 100 to obtain the percentage. Out of the total respondents, 122 students strongly agreed and 25 students agreed to “Large Extent” that "Technological devices improve their grades." In summary, 88% of the students expressed their belief that technological devices can positively impact their academic performance. Additionally, 90% of the students agreed that they could effectively complete their online assessments. This indicates that students were able to proficiently utilize ICTs for online assessments and found them easy to use, which contributed to their improved attitudes towards their use. According to Venkatesh and Davis (2000), having a positive intention to use specific technological devices is significant as it signifies that the technology is perceived as useful.

Table 2: The influence of ICTs on student academic performance

	Positive attitude (Large/very large extent)	Negative attitude (small/ to no extent)	Moderate respondents
Student responses	478+381	24+68	57
Total	859	92	57

The above Table summarises the totals from Table 1 to provide a clear picture of students'. The provided table presents a comprehensive overview of the data from Table 1, offering a clear understanding of students' attitudes towards the impact of ICTs on their academic performance. The majority of students exhibit a positive attitude towards the influence of ICTs on academic performance. Conversely, there were relatively low instances of negative attitudes, totaling 92, along with 57 moderate responses. It is important to consider these negative findings as they contribute valuable insights for addressing the grey areas of ICTs in tertiary institutions that require improvement. The overall findings suggest a positive attitude towards the influence of ICTs, indicating that they can indeed impact students' academic performance. Furthermore, the study identified additional variables beyond the scope of the TAM theoretical framework, which influence students' perceptions of the usefulness and ease of use of ICTs. These external variables have been recognized as factors affecting the TAM and its application to the impact of ICTs on students' academic performance. The survey responses emphasize the significance of Internet connectivity, individual factors, IT skills, and technological devices as variables that influence students' acceptance of ICTs for completing their academic work.

The study adhered to the TAM theoretical model, which considers perceived ease of use and usefulness as interconnected components. This alignment supports the underlying theory that guided the research. It has been established that positive attitudes towards utilizing ICTs not only enhance social interaction but also offer valuable opportunities for students in tertiary institutions (McNicholl *et al.*, 2021). Tertiary institutions recognize the importance of fostering learning environments that promote active peer engagement and collaborative discussions among students. To facilitate this, they make use of assistive technology (AT) within social groups. However, when it comes to students who rely on AT for communication, their level of interaction is influenced by factors such as group size and the presence of a personal assistant, which is crucial in providing them with a sense of personal space (McNicholl *et al.*, 2021).

Table 3: Influences that can negatively impact student academic performance.

	To no extent disagree	Small extent	Moderate extent	Large extent	Very large extent
High data prices.	0	4	11	25	128
Load shading or power outages.	0	7	6	57	98
Internet coverage or speed.	1	6	9	69	83
Social media distractions, e.g. Facebook, Instagram, WhatsApp, and Twitter.	4	20	22	60	62
Home distractions e.g. home chores, family responsibility	12	21	16	56	63

By combining the responses for "very large extent" and "large extent," as well as "small extent" and "to no extent disagree," and then dividing the sum by the total number of respondents (168) and multiplying by 100, we can calculate the percentage of positive and negative findings. Table 3 illustrates that 128 students, comprising 72% of the sample population, were affected by "high data prices." This is concerning because students who cannot afford data due to high prices may face difficulties attending lectures, accessing online resources, and potentially completing assessments. Additionally, "Load shedding" (power outages) negatively impacted 92% of the respondents, while inadequate "Internet coverage" posed a challenge for 90% of the respondents. Insufficient Internet coverage can have adverse effects on students, as they may encounter difficulties in writing or completing online assessments, leading to poorer academic performance.

Table 4: Student's technological devices that enable learning for academic purposes.

	Strongly disagree	Disagree	Agree	Strongly agree
I often use technological devices such as laptops, tablets, smartphones, etc.	3	5	33	127
The institution prepared me for the technologies I would need for my course.	9	19	79	42
Wi-Fi connectivity in class helps me use my device effectively for academic purposes.	5	9	83	71
The institutional website has enough materials to help me with my studies.	1	13	61	92

Based on the information presented in Table 4, students have generally shown positive responses regarding the use of technological devices for their academic learning. However, a minority of 19% of students expressed disagreement with the statement, "The institution prepared me for the technologies I would need for my course." Although this percentage may not be very high, such findings cannot be disregarded, particularly by tertiary institutions, as they bear the responsibility of ensuring that every student possesses the necessary technological skills. Therefore, prioritizing students' preparation for the technological devices required for their courses becomes imperative. Moreover, it is crucial for the institutional website to be user-friendly, allowing students to effectively carry out their academic tasks. The findings revealed that 19 students believed the institution adequately prepared them for the required technologies, while 13 students indicated that the institutional website provides sufficient materials to support their studies. These findings highlight the importance of making institutional technologies and websites more user-friendly to enhance their perceived usefulness and ease of use.

When considering the TAM theoretical framework, most students held the perception that ICTs positively impact or influence their academic performance. This perception was driven by their recognition of ICTs as user-friendly and valuable tools in their studies. The students' intention in utilizing these technological devices was to enhance their academic performance. It is a common tendency for individuals to prefer and engage with technologies that are easy to use (Austermarn, 1998). The findings of the study indicated that the institutional resources provided were sufficient in assisting students. The recommended ICTs by the tertiary institution aligned with the students' requirements for completing their academic work, as evidenced by 83 students strongly agreeing that the "Institutional website" was helpful to them. The following section will delve into potential factors that may impede student academic performance. The research aimed to enhance the TAM framework for investigating the adoption and adaptation of ICTs in remote teaching and learning.

The study utilized the TAM theoretical framework to investigate the user acceptance process, providing the foundation for the research methodology. Through the study, certain aspects emerged that warranted the development of a theoretical framework based on the findings. This resulted in the creation of the Extended Technological Acceptance Model (ETAM), as depicted in Figure 2. The study identified key variables that impact the use of ICTs in student academic performance, which can lead to positive or negative effects in teaching and learning. The findings discussed in the results section (Section 4) were instrumental in shaping the new TAM framework. These findings provided insights that were incorporated into the new framework, outlining various variables that were deemed relevant and significant in addressing the research questions.

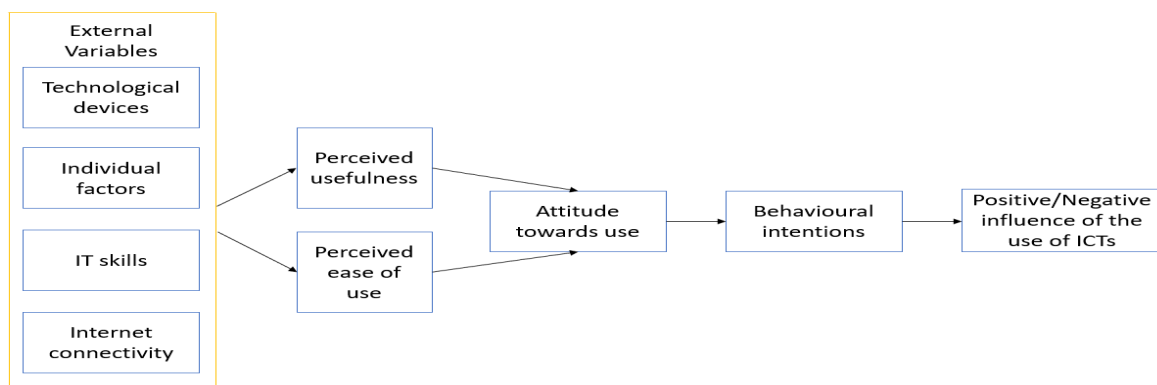


Figure 2: *Extended Technology Acceptance Model*

Figure 2 presents the external variables, namely "Internet connectivity, individual factors, IT skills, and technological devices." These external variables encompass factors such as an individual's inclination towards specific technologies like smartphones, laptops, tablets, and desktop computers. Constructs such as perceived ease of use and usefulness are employed to gauge individual beliefs, which in turn are influenced by the external variables (Toan and Thu, 2017). The external variables in the Expanded Technological Acceptance Model (ETAM) have a direct impact on "perceived ease of use" and "perceived usefulness". The derivation of the ETAM theoretical framework was based on the findings uncovered by the researcher, highlighting the most significant variables. Consequently, both constructs or variables, namely perceived ease of use and

perceived usefulness, have an influence on individuals' "attitudes towards use" and their "behavioral intentions".

The importance of ICTs in tertiary institutions has significantly increased, and there is ample room for further expansion due to the growing demand and usage. However, it is important to note that this study did not specifically investigate the relationship between ICT usage and the grades achieved by students. As a result, the study did not directly measure any correlation between actual grades and the utilization of ICTs. It would have been valuable for this study to assess the impact of using technological devices on grades. Further research is necessary to determine which devices effectively contribute to improving students' grades. Nevertheless, the findings of this study suggest that ICTs do influence students' academic performance. These findings can be useful for tertiary institutions in identifying beneficial technological devices that can assist students in their academic endeavors. Additionally, the findings indicate that students utilize technological devices as a means of communication when completing assessments and assignments.

The findings suggest that institutions should increase their investment in ICTs, particularly considering the rise of online classes due to the impact of the Covid-19 pandemic. The use of ICTs has shown to enhance students' collaboration and enthusiasm towards their academic studies, potentially leading to improved academic performance. Equipping students with ICTs not only benefits them during their studies but also provides them with valuable expertise and experience that can be advantageous in their future workplaces. Moreover, ICTs enable students to easily access a wide range of information from various sources and internet platforms. The study's findings align with the Expanded Technological Acceptance Model (ETAM), as more students exhibit a positive outlook towards using ICTs. Overall, the feedback from the students indicates a strong preference for using ICTs as the preferred method for online studies and face-to-face lectures.

ICT seems to be on the rise as students are positive about how much they are benefiting from ICT integration (Bagarukayo and Kalema, 2015; Khan and Jan, 2015; Adam and Tatnall, 2017). Consequently, a higher level of positivity among students correlated with increased engagement in learning activities. However, it is crucial to acknowledge that ICTs alone cannot ensure academic success. The study did not consider factors such as the manner in which technological devices are utilized, the quality of the devices employed, learning environments, and student motivation, which can also influence academic outcomes. Furthermore, the study identified certain limitations, including not reaching the desired number of respondents of 200+ and the absence of additional data collection methods such as paper-based surveys. Therefore, the study recommends further research to address these limitations, as discussed earlier.

Keywords: Information Communication Technologies; ICTs; Technology Acceptance Model; TAM, Academic Performance; Tertiary Institutions