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Mfingwana, Nwabisa

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Research Report

Learning Management Systems within a South African university: lecturers' experiences and extent of use during and post COVID-19

Submitted by:
Nwabisa Mfingwana
2116854

Supervisor: Dr Suzanne Sackstein

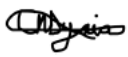
Declaration

I declare that this research report is my own unaided work. It is submitted for the degree of Master of Commerce in Information Systems at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any other degree or examination to any other University.

_____

Nwabisa Mfingwana

07 August 2023



Dedication

I dedicate this dissertation to my late father, Mthobeli Dyayiya, whom I lost back in November 1999, while I was sitting for my second-year exams of my undergrad. He held me very dear to his heart and it would have been such a pleasure to have him around to celebrate this milestone with me, but I know he is always with me in spirit, may you continue to rest in peace Bhele!

ACKNOWLEDGEMENTS

There are a couple of people I would like to acknowledge whom without their support this dissertation would not have been possible.

Firstly, I would like to thank the Lord Almighty for the gift of life, His provision, His hand of grace upon my life and the strength to complete this dissertation.

Secondly, my supervisor, Dr Suzanne Sackstein, who held my hand throughout this journey and sometimes going beyond her call of duty to offer emotional support when I thought I could no longer do it.

Thirdly, my husband, Skhu Mfingwana, whom throughout this journey single-handedly ran our household, became a dad and a mom to our beautiful kids, thank you my love for all the sacrifices you have made.

Fourthly, my kids, Inga and Amila, whom I took a lot of their time locking myself in the study room when I was supposed to have been spending time with them, sorry for skipping your special soccer matches my boy.

Lastly, my mother, Thobeka Dyayiya, thank you for throwing a huge fight in that ICU bed and my siblings, Thumeka and Aziwe for stepping up, nursing mom back to health when big sister was swamped with schoolwork.

To all my family and friends, whom I could not support and be available to celebrate your milestones during this process, once again accept my apologies and thank you for your understanding and continued support.

ABSTRACT

The integration of technology in the education sector has resulted in pervasive use of Learning Management Systems (LMSs). Prior and during COVID-19, several higher education institutions within South Africa acquired and started using LMSs to enable and facilitate online teaching and learning. During COVID-19 when face-to-face learning was impossible due to lockdowns, LMSs became even more prominent, advancing from being learning support tools to becoming primary learning systems. While prior research claims that LMSs are underutilised, as the world transitions to the new normal, with hybrid learning being the latest learning method, LMSs appear to be just as significant. To explore the experiences and extent of use of LMS, this study employed the Will, Skill, Tool, and Pedagogy (WSTP) model. Using semi-structured interviews, data was collected from nine lecturers who teach technology and creative arts programs at a Johannesburg based university in South Africa. Findings indicate that even though lecturers view LMSs as a valuable tool, it is not a perfect fit for the needs and requirements of all university programmes. Furthermore, although use of LMSs grew exponentially and pervasively during COVID-19, post the pandemic lecturers' use patterns are more varying. While some lecturers in the creative art programme are reducing or stopping their use of certain LMS features as they favour of in-person teaching and believe that the LMS may not be aligned to their teaching style. However, lecturers in technology are continuing their current use, and in some cases are even more curious and enthusiastic about the tool. Lastly, despite the reported benefits of LMSs such as content management and communication, challenges related to system constraints, functional limitations, infrastructure issues and limited technology and LMS skills were reported. Theoretically the study contributes to the body of knowledge about lecturers' use of LMSs and illustrates how the WSTP model can be used in similar contexts. Practically the study highlights that a comprehensive needs and requirements analysis should be conducted by decision makers prior to implementing a one-fits-all approach, training and ongoing awareness of LMS features is critical to ensure that the system is used optimally.

Keywords: Learning Management Systems, LMSs, Technology, eLearning, LMS, Lecturers, COVID-19, pandemic, WSTP, Higher education institutions

TABLE OF CONTENTS

ABSTRACT 5

1 INTRODUCTION 1

1.1 Context and Background 1
1.2 Problem statement 2
1.3 Research Questions 3
1.4 Research Objectives 3
1.5 Significance of the study 4
1.6 Delimitations 4
1.7 Conclusion 4

2. LITERATURE REVIEW 5

2.1 Technology use in the general context 5
2.2 Technology use in the education sector 5
2.3 Learning Management Systems (LMS) 7
2.3.1 LMS features 8
2.3.2 Types of LMS 9
2.3.3 Benefits of LMS 10
2.3.4 Challenges of LMS 12
2.4 The role of lecturers in LMS 14
2.4.1 Lecturers' Pedagogical Beliefs 14
2.5 Literature review conclusion 15

3. CONCEPTUAL FRAMEWORK 16

3.1 Task-technology fit (TTF) 16
3.1.1 Use of TTF 17
3.1.2 Reasons for not selecting TTF 17
3.2 Theory of planned behaviour (TPB) 17
3.2.1 Use of TPB 18
3.2.2 Reasons for not selecting TPB 18
3.3 The Will–Skill–Tool-Pedagogy Model (WSTP) 18
3.3.1 Use of WSTP 19
3.3.2 Reasons for selecting WSTP 19
3.4 Conceptual Framework – Application to WSTP 20
3.4.1 Will factor 20
3.4.2 Skill factor 21

3.4.3 Tool factor 22
3.4.4 Pedagogy 22
3.5 Conceptual framework conclusion 24

4. RESEARCH METHODOLOGY 25

4.1 Research Paradigm 25
4.2 Research Approach 26
4.3 Research Design 26
4.3.1 Case Study research approach 27
4.4 Data Analysis 31
4.4.1 Analysis Methods 31
4.4.2 Thematic Analysis Process 32
4.5 Evaluation criteria 33
4.5.1 Credibility 34
4.5.2 Dependability 34
4.5.3 Transferability 34
4.5.4 Confirmability 34
4.6 Ethical considerations 35
4.6.1 Formal participant consent 35
4.6.2 Confidentiality and anonymity 35
4.6.3 Permission 36
4.7 Research methodology conclusion 36

5. FINDINGS AND DISCUSSION 37

5.1 Case Study Site 37
5.2 Lecturers interviewed 37
5.3 Will 39
5.3.1 Lecturer Beliefs 39
5.3.2 Benefits of using LMS 41
5.3.3 Challenges of using LMS 43
5.3.4 Lecturers' attitudes 45
5.4 Skill 47
5.4.1 Lecturers' LMS competencies 48
5.4.2 Skills level analysis 48
5.5 Tool 50
5.5.1 Lecturers' awareness of LMS Features 50
5.5.2 Lecturers' use of LMS features 51
5.5.3 Lecturers' Perception of LMS support 53
5.5.4 Used and under-used LMS Features 53
5.5.5 Challenges of LMS Features 55
5.5.6 LMS availability 55
5.6 Pedagogy 56
5.6.1 Lecturers Teaching Styles 56
5.6.2 Role of Technology in Teaching 57
5.6.3 LMS and Lecturers' Teaching Styles 57

5.7 CONCLUSION 58

6. DISCUSSION 59

6.1 WILL 59
6.1.1 BELIEFS 59
6.1.2 BENEFITS 60
6.1.3 CHALLENGES 61
6.1.4 ATTITUDES 63
6.2 SKILL 63
6.3 TOOL 64
6.3.1 LMS AWARENESS AND USE OF LMS FEATURES 64
6.3.2 UNDER-USED LMS FEATURES 65
6.3.3 CHALLENGES OF LMS FEATURES 65
6.3.4 LECTURERS' PERCEPTION OF LMS SUPPORT AND AVAILABILITY 66
6.4 PEDAGOGY 66
6.4.1 LECTURERS' TEACHING STYLES 66
6.4.2 ROLE OF TECHNOLOGY IN TEACHING 67
6.4.3 LMS AND LECTURERS' TEACHING STYLES 67
6.5 CONCLUSION 68

7. CONCLUSION, LIMITATIONS AND FUTURE RESEARCH 69

7.1 RESEARCH OVERVIEW 69
7.2 REFLECTION ON WILL 70
7.3 REFLECTION ON TOOL 71
7.3.1 FEATURES 71
7.3.2 BENEFITS 72
7.3.3 CHALLENGES 72
7.4 REFLECTION ON SKILL 72
7.4.1 LECTURERS' LMS SKILLS 72
7.4.2 LECTURERS' LMS EXPERIENCE 73
7.5 REFLECTION ON PEDAGOGY 73
7.6 CONTRIBUTION OF THE STUDY 74
7.6.1 THEORETICAL CONTRIBUTIONS 74
7.6.2 PRACTICAL CONTRIBUTIONS 74
7.7 LIMITATIONS 75
7.8 FUTURE RESEARCH 75

REFERENCES..... 76

APPENDICES..... 105

APPENDIX A: ETHICAL FORMS..... 105

APPENDIX A-1 PARTICIPATION LETTER 105
APPENDIX A-2 INFORMED CONSENT 107
APPENDIX A-3 PERMISSION LETTER.....108
APPENDIX A-4 ETHICAL CLEARANCE CERTIFICATE.....109

APPENDIX B RESEARCH PROTOCOL 110

APPENDIX C SAMPLE TRANSCRIPT 111

LIST OF FIGURES

Figure 3.1: WSTP Model of technology integration (Knezek & Christensen, 2016) 20

Figure 3.2: WSTP adopted for Conceptual Framework 23

Figure 4.1: Thematic Analysis Process based on Braun and Clarke (2006).....33

Figure 5.1: LMS Features 51

Figure 7.1: Adopted WSTP Model 70

1 INTRODUCTION

The COVID-19 pandemic has not only increased digital technology use in higher education institutions but has also accelerated digital transformation (DT) across all educational levels (Iivari, Sharma & Ventä-Olkkonen, 2020; Mhlanga & Moloi, 2020). According to Fleaca (2017) and Mhlanga, Denhere and Moloi (2022), DT transforms the current education system by using information and communication technologies (ICT) together with applied process thinking principles, to capture and model activities required for teaching and learning activities. Integrating ICT in education has become increasingly popular and pervasive (Bai, Li & Liu, 2021), enabling the teaching and learning processes to evolve into online (Valdés, Alpera & Suárez, 2021), distance, and blended learning environments (Røe, Wojniusz & Bjerke, 2022).

Online learning (also referred to as e-learning), a commonly used alternative to traditional learning methods in education (Bagde, Bobde & Bagde, 2021), uses ICT to enable delivery of educational content between instructors and students where distance or time differences separate them (Al-Fraihat, Joy, Masa'deh & Sinclair, 2019; Sharifov & Mustafa, 2020; Tarhini, Arachchilage, Masa'deh & Abbasi, 2015). One prominent enabler of online learning is the Learning Management System (LMS), which provides a collective educational environment (Aldiab, Chowdhury, Kootsookos, Alam & Allhibi, 2019; Maphalala & Adigun, 2020), with features such as collaboration, file sharing, messaging, data storage capabilities and a variety of external integrations that are highly beneficial in the teaching and learning teaching process (Lim, 2021).

Even though the COVID-19 pandemic and its associated restrictions are disappearing and in-person learning is being resumed (Alawamleh, Al-Twait & Al-Saht, 2022; Li, Zhang, Liu & Tomg, 2022), Aljahromi (2020) argues that LMSs will remain a relevant and significant part of the higher education learning system as they offer options for hybrid teaching and learning with virtual possibilities including the ability for students and lecturers to interact beyond physical limitations (Al-Ataby, 2021; Al-Ataby & Al-Nuaimy, 2019).

1.1 Context and Background

While for the last 20 years the education sector has been digitally transforming (Balyer & Oz, 2018), during Covid-19, which was detected in China in December 2019 (WHO, 2020) and

declared a pandemic by the World Health Organisation in March 2020, the need to use technology became more urgent. This urgency resulted from most countries instituting lockdowns and closures to slow the spread of the virus (WHO, 2020), with face-to-face learning being immediately prohibited (Kuliya & Usman, 2021) for 1.3 billion learners (UNESCO, 2020).

Within South Africa, the government imposed a hard lockdown to restrict personnel movement in areas of travel and large gatherings such as work, school and church attendance (Zuma-Dlamini, 2020). So too, the education sector (schools, colleges and universities) was forced to immediately shut down contact classes (Watermeyer, Crick, Knight & Goodall, 2021). While some universities already had LMSs in place, many of these systems were not being used as core learning tools but rather as assistant portals to complement traditional classroom learning (Aldiab, Chowdhury, Kootsookos, Alam & Allhibi, 2019; Mpungose, 2020a). For those institutions that had already undergone digital transformation, switching immediately to e-learning methods using LMSs was almost seamless (Aldiab et al., 2019; Almazova, Rubtsova & Odinokaya, 2020; Sobaih, Hasanein & Abu Elnasr, 2020). However, many institutions that had not yet embarked on a DT strategy urgently had to acquire and rollout new LMSs with minimal training and support in order to adjust to the new circumstances due to the pandemic (Mhlanga & Moloi, 2020; Mpungose, 2020a; Li & Lalani, 2020).

1.2 Problem statement

Irrespective of the financial constraints facing higher educational institutions (Friga, 2020), institutions are investing large amounts of time and money to accelerate the use of LMS for online and blended learning purposes (Asarta & Schmidt, 2020; Dhawan, 2020; Krishnamurthy, 2020). However, in spite of the institutions' efforts, Washington (2019) claims that many LMS implementations are underutilised and are not actively being used for core teaching and learning activities (Alghamdi & Bayaga, 2016). According to Dlalisa and Govender (2020), Mokhtar, Katan and Hidayat-ur-Rehman (2018) lecturers play the most important role in the use of LMS as they determine the extent of use by setting up learning activities for student consumption (Mhungu, 2018).

Prior to Covid-19, it was not mandatory for lecturers to use LMS to conduct teaching in contact universities as this was primarily done in person through contact sessions (Dhawan, 2020), resulting in institutions using LMS infrequently (Washington, 2019). When contact sessions could no longer

be held due to Covid-19 restrictions, the use of LMS became mandatory (Gamede, Ajani & Afolabi, 2021; Multazam, Korompot & Munir, 2022; Sharifov & Mustafa, 2020) as LMS became the only mechanism in which teaching and learning could be conducted. This meant that lecturers had to transition from a position of casually using LMSs, to being obligated to use LMS as no other alternative was available. Consequently, due to the urgent and immediate switch to online learning, a number of institutions were unable to conduct sufficient user training prior to system rollouts, resulting in lecturers being poorly onboarded into using LMS (Mpungose, 2020b).

As the world slowly moves back to a mix of face-to-face and online education, it appears that LMSs will continue to be part of the learning eco system, and thus it is important to explore lecturers' experiences and perceptions of LMSs so that institutions can ensure that the chosen LMS provides the expected benefits, adequately services the intended learning and teaching outcomes, and that the money invested is worthwhile.

1.3 Research Questions

As this research aims to understand lecturers' experiences and extent of LMS use in a South African university with COVID-19 as a context, the main research question is: *What are different lecturers' experiences of and extent of use with Learning Management Systems within a tertiary education in SA during and post COVID-19?*

To answer the main research question, the following sub-questions have been formulated:

1. What are different lecturers' beliefs and attitudes towards LMSs?
2. What are different lecturers' skills and level of experience with regard to using LMSs?
3. What features are available on the LMS?
4. What are different lecturers' perceptions of benefits and challenges of LMSs?
5. What are different lecturers' styles of teaching?

1.4 Research Objectives

The objectives of the study are firstly to describe lecturers' perceptions, experience, and extent of use of LMS during and post Covid-19 so that a better understanding of the future of LMSs can be explored. Secondly, the study aims to explore the underlying reasons lecturers find certain LMS features beneficial and others challenging so that possible interventions to assist lecturers can be explored.

1.5 Significance of the study

This study aims to contribute to both academia and practitioners. Firstly, for academics the study will contribute to the body of knowledge by carrying out empirical research to assess the applicability of the selected Conceptual Framework (CF) as well as contribute towards the eLearning phenomenon by understanding use in a context where the switch to 100% eLearning occurs with no prior evaluation of user readiness nor transitional plan. Secondly, for practitioners the study can be used by: (1) institutional decision-makers to make informed decisions about LMS acquisitions, features, and training programmes, (2) LMS vendors to gain greater insights into the lecturers' experiences and challenges when using their LMS to inform the scope and design of the upcoming LMS versions and platform upgrades, and (3) lecturers will be more aware of their LMS use and non-use and can thus explore possible features that may support and enhance their teaching.

1.6 Delimitations

As this study aims to investigate lecturers' use and experience of LMSs, student perceptions will not be addressed.

1.7 Conclusion

This section provided a brief overview of the background and context of the study. Following that, a problem statement, research questions and research objectives were presented. Lastly, the significance of the study was discussed, followed by the study's delimitations. The next section presents a detailed review of current literature in relation to the use of technology in the general context, how technology is used in education, what LMSs are including its features, available types, benefits, challenges, and a discussion of the role lecturers play in LMS.

2. LITERATURE REVIEW

As the purpose of this study is to understand lecturers' experiences and extent of LMS use within higher education institutions, literature relating to technology, technology use within education, and LMS needs to be reviewed. This section begins by discussing use of technology in the general context, then technology use in education is presented. Thereafter, an overview of LMSs is provided, detailing features, types, adoption, benefits, and challenges. Following that, the role of lecturers in LMS use is discussed.

2.1 Technology use in the general context

The rapid development of technology over the last century has resulted in our daily routines being deeply enmeshed with technology (Keesara, Jonas & Schulman, 2020), the global economy being transformed (Kalimullina, Tarman & Stepanoba, 2021), and influenced every aspect of human life (Ibe, 2021; Ratheeswari, 2018) in every sector including business, education, healthcare, etc. (Khanna & Kaur, 2019; Mintah-Asare, 2020; Ratheeswari, 2018). For example, technologies such as Internet of Things (IoT), Cloud computing, Artificial Intelligence (AI), and Block Chain (BC) are playing crucial roles in the healthcare industry (Abu-elezz, Hassan, Nazeemudeen, Housen & Abd-alrazaq, 2020; Akram, Malik, Singh, Anita & Tanwar, 2020), by improving accuracy, efficiency, convenience, patient care, diagnosis and treatment (Dankwa-Mullan, Rivo, Sepulveda, Park, Snowdon & Rhee, 2019). Similarly, current implementations of Cloud computing provide convenience and secured computing benefitting almost all industries (Dang, Piran, Han, Min & Moon, 2019). So too, within the education sector, innovations such as e-learning are digitally transforming traditional face to face learning contexts (Adeoye, Adanikin, Adanikin, 2020; Alzahrani, 2020). The presented evidence clearly demonstrates the extent in which technology has enhanced a lot of the day-to-day activities in society to the most critical functions such education and healthcare. As this study is interested in the use of technology within the educational context, related literature is discussed below.

2.2 Technology use in the education sector

The integration of Information and Communication Technology (ICT) in education is being promoted as a necessary strategy to foster innovative changes in current teaching and learning methods (Sadeghi, 2019; Sultana & Haque, 2018), with significant investments being made at various levels to digitise the educational context (Dhawan, 2020; Kalimullina et al., 2021;

Krishnamurthy, 2020). Generally, increased productivity, reliability, performance, security and efficiency are some of the most common reported benefits from the technology integration research in education (Dang et al., 2019; Dankwa-Mullan et al., 2019; Jibril, Abdurrahman, Abba & Isma'il, 2018).

More recently, due to the advancement of technology, even more innovative ways of integrating technology into education are taking place (Sadeghi, 2019). These include, but are not limited to the use of: Web 2.0 applications to integrate social networking sites into the teaching and learning process (Mhungu, 2018); instructional tools such as Zoom, Microsoft teams, Google hangout (meet), Skype, and Google classroom, are being used to deliver learning content (Kalimullina, Tarman & Stepanova, 2021); blockchain applications to manage academic degrees and cumulative evaluations for learning outcomes (Skiba, 2017; Chen, Xu, Lu & Chen, 2018); and technology tools to assist in the learning of different languages (Barreto, 2018). One of the most widespread uses of technology within education is e-learning (Agabi, 2019), which facilitates learning outside the classroom via the internet (Agabi, 2019; Røe, Wojniusz & Bjerke, 2022; Sucuoğlu & Andrew, 2022).

E-learning is largely enabled by a combination of different resources including electronic technologies (internet, computers, software applications), human and material resources (Agabi, 2019). According to Tawafak, AlSideir, Alfarsi, AlNuaimi, Malik and Jabbar (2020) e-learning is being used in many institutions of higher learning as it accommodates a large-scale enrolment of students (Khan, Hameed, Yu, Islam and Sheikh, 2018), enabling flexible and convenient capabilities so that lecturers and students can communicate easily (Jachin & Usagawa, 2017; Lee, Yeung & Ip, 2017; Tawafak, Mohammed, Arshah, Shakir & Mezhuyev, 2018; Wu & Chen, 2017). Observing from the above literature, it can be argued that e-learning is the greatest innovation to ever be introduced in the education sector due to its wide use and the many benefits that it affords institutions of learning. Even more pleasing is that institutions have a wide variety of tools to choose from as described by (Kalimullina, Tarman & Stepanova, 2021; Skiba, 2017; Chen, Xu, Lu & Chen, 2018; Barreto, 2018). As this research is interested in the use of LMS as a specific type of e-learning technology, literature on LMSs is presented below.

2.3 Learning Management Systems (LMS)

A LMS is a comprehensive web-based technology that provides an efficient and effective way to store, manage, share academic resources and knowledge (Bradley, 2021) and can be used to support or transform traditional ways of teaching and learning (Kalimullina, Tarman & Stepanova, 2021). According to Al-Sharhan, Al-Hunaiyyan, Alhajri and Al-Huwail, 2020) LMSs aid institutions by utilising its tools and functionalities to improve pedagogy and to increase the quality of learning.

As LMSs become more technologically, operationally and economically viable (Palvia, Aeron, Gupta, Mahapatra, Parida, Rosner and Sindhi, 2018), there is a large number of institutions that have rolled out LMSs to manage the educational content delivery and expand the teaching and learning experience (Aldiab, Chowdhury, Kootsookos, Alam & Allhibi, 2019; Letseka, Letseka & Pitsoe, 2018; Papadakis, Kalogiannakis, Sifaki & Vidakis, 2018).

In South Africa alone, most of the 26 public universities within the country, have adopted LMSs with about 46% using Blackboard, 34% on Moodle, and the rest using other kinds of learning platforms (Badaru & Adu, 2022). For example, the University of the Witwatersrand utilises Canvas (Tshite & George, 2022), the University of KwaZulu Natal, University of South Africa, and the Nelson Mandela University use Moodle (Gumbo, 2019; Padayachee, Wagner-Welsh & Johannes, 2018) and the University of Johannesburg and the University of Pretoria work on Blackboard (Ismail, Yelverton, Rademan & Peterson, 2022; Mihai, 2022). While these LMS may fall between the different categories of LMS (covered in Section 2.3.2), the common goal is to provide an efficient and effective platform where online teaching and learning can take place (Gamede, Ajani & Afolabi, 2021).

During the COVID-19 pandemic, due to the closure of educational institutions and the closure of face-to-face teaching and learning, the use of LMS during COVID-19 grew rapidly (Gamede et al., 2021; Mpungose, 2020a, 2020b). This resulted in LMSs moving from predominantly playing a supporting role to one where their role was central to offering continued teaching and learning (Kele & Mzileni, 2021). In the South African context, while some universities already had LMS as previously evaluated by Bagarukayo & Kalema (2015), because of the huge demand, some universities needed to re-prioritise LMS by converting to higher performance systems (Badaru & Adu, 2022).

2.3.1 LMS features

Major functions offered by LMSs include: built-in assessment engines (Badaru & Adu, 2022); collaboration features (Wicaksono, Nawisworo, Wahyuni & Cholily, 2021); performance and reporting (Turnbull, Chug & Luck, 2021); communication features (Alzahrani, 2019); centralisation features (Lim, 2021); plagiarism checking feature (Saputro, Saerozi, Siswanta, Siswanto & Susilowati, 2020); and course management features (Badaru & Adu, 2022).

Firstly, the *assessment engine* enables lecturers to create assessments aligned to key aspects of students' academic progress and performances measuring against online teaching and learning objectives and outcomes (Badaru & Adu, 2022; Turnbull, Chug and Luck, 2021). Secondly, *collaboration features* enable online forums, thread discussions, digital collaboration to take place within the platform allowing a seamless student and lecturer collaboration outside the physical classroom (Aldiab, Chowdhury, Kootsookos, Alam & Allhibi, 2019; Sabharwal, Chugh, Hossain & Wells, 2018). Thirdly, *performance and reporting features* offer the ability for lectures to evaluate student assessment activities, track performance, plan examination and statistical analyses, all contributing towards supporting a wholesome learning process (Sabharwal et al., 2018; Turnbull et al., 2021). Fourthly, *communication features* enable seamless communication between students and educators to enrich the learning process (Sabharwal et al., 2018), through features such as virtual classes, video conferencing, emails, live and offline chats (Alzahrani, 2019). Fifthly, *centralisation features* allow for a central repository where files could be uploaded, shared, and retrieved at any time by both students and lecturers (Lim, 2021; Ukpai, 2021)[1]. Sixthly, LMS have built in *plagiarism software* that integrates with external systems to validate originality of submitted academic work (Saputro et al., 2020). Lastly, *the courses feature* groups together and displays details relating to the course including course syllabus, course evaluation, lesson planning for ease of course management (Badaru & Adu, 2022).

[1] The benefits of LMS features are discussed in Section 2.3.3.

While all LMSs aim to offer the same core functions, various types of LMSs implementations exist, these are detailed below.

2.3.2 Types of LMS

Types of LMSs are primarily defined according to the underlying architecture and licensing requirements of the solution (Alghamdi & Bayaga, 2016; Ülker & Yılmaz, 2016). LMSs are commonly classified into either proprietary (full package service), open source, cloud-based, or commercial (enterprise) systems (Kunju, 2021).

Proprietary LMSs aim to make a profit through licensing (Ghilay, 2019), and thus are built using exclusive code which requires for institutions to buy subscription licenses to access and use the LMS (Kehrwald & Parker, 2019; Kimmons et al., 2019). While *open-source* LMSs such as Moodle are freely accessible and do not require a license to access and use the system (Kehrwald & Parker, 2019; Kimmons et al., 2019; Turnbull et al., 2021), it is important to note that these LMSs do require a nominal fee for additional add-on features and upgrades (Kunju, 2021). For *cloud-based* offerings the LMS is hosted and managed by the vendor on cloud, offering convenience and lower costs as the LMS does not need to be hosted by the institution (Brush, 2019), but maintenance of the system and technical upgrades are additional (Brush, 2019). Notwithstanding the costs associated with cloud-based solutions, these LMSs are cheaper than proprietary systems, but still require a high level of investment in security to avoid potential data breach risks (Brush, 2019). Lastly, *commercial* types of LMSs are highly scalable (i.e., enterprise /premium) and are ideal for large enterprises and require license agreements for use, distribution, and technical support (Sharifov & Mustafa, 2020). Thus, institutional budget and availability of funds is important when selecting the most appropriate LMS solution (Brush, 2019; Kimmons, Hunsaker, Jones, & Stauffer, 2019). While cost, which differs vastly in the different types of LMSs, is a major consideration, Turnbull, Chugh and Luck (2021) claim that institutional requirements such as number of users, resources available, and knowledge or level of expertise of the LMS users are just as important in determining the most fitting system.

Previous research shows that there are a number of ways in which lecturers benefit from the use of LMS, these are discussed below.

2.3.3 Benefits of LMS

Literature discussing LMS identifies several benefits as detailed below, these include: asynchronous and synchronous communication (Alzahrani, 2019); collaborative online learning (Jung & Huh, 2019); flexibility and accessibility (Ghilay, 2019; Kehrwald & Parker, 2019); monitoring and evaluation (Ghilay, 2019; Turnbull, Chugh, Luck & Tatnall, 2020) and grading (Turnbull et al., 2020; Ukpai, 2021).

2.3.3.1 Asynchronous and synchronous communication

LMS provides a structure for synchronous (e.g. video conferencing) and asynchronous (i.e., emails, discussion groups, audio discussions, chat groups) communication to enhance student and lecturer interactions (Alzahrani, 2019). Synchronous communication occurs in real time, and is facilitated through the LMS with functions such as video/audio calls and live chats (Wicaksono et al., 2021), while asynchronous communication which takes place at a time that is convenient for the user involving features such as discussion groups, bulletin boards etc.(Aldiab, Chowdhury, Kootsookos, Alam & Allhibi, 2019; Al-Hunaiyyan, Alhajri & Al-Sharhan, 2020). Irrespective of the mode of communication, both methods enable learning and academic support to occur outside the classroom (Alhazmi, Imtiaz, Al-Hammadi & Kaed, 2021).

For example, asynchronous features enable lecturers and students to create and access academic content in parallel with other commitments and responsibilities, as they can communicate and exchange information with students quickly and flexibly (Gunawan, Sahidu, Susilawati, Harjono & Herayanti, 2019) at times that are most convenient (Alzahrani, 2019). Furthermore, lecturers can use asynchronous communication to record lessons through videos or voice notes so that students can access them when it is most suited to them (Lowenthal, Borup, West & Archambault, 2020).

2.3.3.2 Collaborative online learning

Collaborative learning occurs when lecturers and students participate with each other to solve learning tasks in an interactive environment (Qureshi, Khaskheli, Qureshi, Raza & Yousufi, 2021). The need for collaborative learning has increased substantially due to Covid-19 and remains crucial in facilitating hybrid education (Ikwunne, Adigwe, Nnamene, Ogwara, Okemiri & Emenike, 2021). Jung and Huh (2019) claim LMSs facilitate collaborative learning through a variety of features. For example, LMSs have several media and communications tools that promote lecturer and student learning choices (Kehrwald & Parker, 2019), through groupings, discussions, and general

communication (Al-Fraihat, Joy & Sinclair, 2019; Jung & Huh, 2019). Furthermore, the ability of the LMS to offer active learning, whilst saving time when managing large groups of students (Mora, Signes-Pont, Fuster-Guillo' & Pertegal-Felices, 2020), enables collaboration to take place.

2.3.3.3 Flexibility and Accessibility

One of the major benefits of a LMS is that it allows lecturers and students unlimited access to learning content regardless of their physical location (Ghilay, 2019; Kehrwald & Parker, 2019; Prasojo, Sowfan, Mukminin, Habibi & Yaqin, 2020). Furthermore, LMSs also eliminate time barriers by enabling 24/7 access to course content (Ghilay, 2019; Prasojo et al., 2020). Prasojo et al. (2020), Kehrwald and Parker (2019) argue that LMSs make teaching much more convenient and flexible due to the capability of uploading learning material anywhere and anytime, thus eliminating the need to travel to and from the classroom (Aldiab, Chowdhury, Kootsookos, Alam & Allhibi, 2019), which is important during crisis situations such as pandemics and man-made or natural disasters (Dhawan, 2020).

2.3.3.4 Monitoring and evaluation

LMSs afford lecturers the ability to track, monitor and evaluate student performance (Ghilay, 2019; Turnbull, Chugh & Luck, 2020). According to Turnbull et al. (2020), Xavier and Meneses (2020) the ability to measure student involvement in a course through measures such as log-on frequency, time spent in various portions of a course, communication exchanges, and the quantity of materials downloaded, is a crucial benefit. Furthermore, Turnbull et al. (2020) claim that as learners dropout rates are increasing in online and hybrid context, LMSs are even more important as they enable lecturers to timeously pick up on student's performance weaknesses and make necessary interventions to prevent students leaving the university.

2.3.3.5 Assessments and Grading

Conducting assessments in a learning environment enables lecturers to measure student accountability, progress, and to support learning (Guangul, Suhail, Khalit & Khidhir, 2020). Ukpai (2021) contends that LMS enable lecturers to easily disseminate individual student results and feedback to support the assessment process. Furthermore, LMSs give lecturers the ability to construct cumulative grade averages as well as extract reporting information such as class grades, item score analysis, and at-risk student information tools (Ferdianto & Dwiniasih, 2019). Thus, simplifying the assessment processes, reducing lecturers' workload, and facilitating the provision

of more timely responses and assessment feedback (Dlalisa & Govender, 2020). Bradley (2021) and Ukpai (2021) contend that the grading feature is the most used functionality within the LMS.

While studies have discussed the strengths of LMS in higher education institutions, various challenges which affect successful use consistency and continuation exist. These are discussed below.

2.3.4 Challenges of LMS

As with any other technology implementation, the integration of LMSs into the education can be challenging. Literature identifies various issues that include limited technology skills (Modise & Molotsi, 2022; Dlalisa & Govender, 2020); restricted LMS functionality for certain types of courses (Mhungu, 2018; Irfan, Kusumaningrum, Yulia & Widodo, 2020; Mpungose, 2020a; Multazam, Korompot & Munir, 2022); and insufficient training (Dlalisa & Govender, 2020).

2.3.4.1 Limited technology skills

To successfully integrate LMS in higher education, lecturers need to be competent and comfortable in both technology and pedagogy (Fernández-Batanero, Cabero-Almenara, Román-Graván̈al & Palacios-Rodríguez, 2022). According to Zaharah, Kirilova and Windarti (2020) when lecturers have limited knowledge or no experience of using the LMS, it creates difficulties to the learning process and ultimately affects continuous use. Not only is continuous use a challenge in LMSs but is largely a problem across several information systems due to users having limited skills. For example, the limitation of technology skills using the LMS is being reported as a major and common hinderance in several studies – low level of computer skills contributes to lecturers' infrequent use of LMS (Dlalisa & Govender, 2020); lecturers' lack of proper technology skills contributes to none-use of LMS (Modise & Molotsi, 2022); lecturers' insufficient skills decelerates use of LMS (Mpungose, 2020a).

In some instances, the technology complexity causes lecturers who are not tech savvy to spend a lot of time figuring out how to perform certain tasks (Lavidas, Komis & Achriani, 2022), leading them to find other ways of accomplishing their tasks outside the tool. As a result, Zheng, Xie, Dai, Chen and Wang (2018) recommend institutions and designers of LMS to focus their attention on the affordances, quality, and technical support services so that it is easily usable for all types of skills set, from basic to advanced users. In addition, Parisi, Kemker, Part, Kanan and Wermter

(2019) recommend that academics need to be trained on the technologies that facilitate the learning process so that they can become comfortable and familiar with using the LMS.

2.3.4.2 Restricted LMS functionality

Incompatibility between the technology design (including its features and capabilities) and the method required by the subject area can obstruct the teaching process and create great disparities (Dhawan, 2020). Specifically with LMS, a few subject-specific studies report functionality constraints and limitations with their institutional LMS to support the nature and requirements of their specific subjects e.g. Maths (Irfan et al., 2020); Graphics design (Mhungu, 2018); English (Multazam, Korompot & Munir, 2022); and Physics (Gunawan, Sahidu, Susilawati, Harjono & Herayanti, 2019).

For example, assessments that are designed and conducted online, generally have a tendency of being only knowledge-based and not necessarily practicality-based, making them more suitable for programs such as engineering and science than humanities (Snoussi, 2019). This finding provokes an argument that perhaps LMSs are not necessarily a one size fits all solution but are more aligned to some faculties than others. Confirming this argument is Irfan et al. (2020) who asserts that inability to fully support some subject areas makes LMS impractical, less desirable, and unpleasant to some lecturers/faculties, which leads to minimal or no use at all.

2.3.4.3 Insufficient training

In order for end users to be efficient and effective in the use of any information systems, they must be properly trained to enable ease of use and interaction with the system (Fujs, Vrhovec & Vavpotič, 2022; Kajbaje & Kamatchi, 2022). Ideally, user training should be conducted before system implementation to build skill and confidence so that they are at ease navigating the system when it eventually gets rolled out (Aguirre, Suarez, Fuentes & Sanchez-Gonzalez, 2019). Gumbo (2019) further cautions that supplying users with just a software application with no knowledge of how to use it is destructive to the teaching and learning process. The abrupt switch into online learning as a result of the COVID-19 pandemic resulted in a lot of challenges for lectures (Turnbull et al., 2021) depriving them of the opportunity to receive proper training (Mhlanga et al., 2022). As a consequence, lecturers are finding lack of training to be one of the challenges that contribute to low usage of LMS (Dlalisa & Govender, 2020; Mpungose, 2020a). Indeed, training is a critical step of

any system rollout that if done properly, users are likely to be more at ease and confident exploring the system resulting in greater use.

While understanding the benefits and challenges of LMSs is essential, the extent of LMS utilisation primarily depends on lecturers' investment and time towards the system (Ghilay, 2017). Therefore, the role lecturers play in the LMS ecosystem is discussed below.

2.4 The role of lecturers in LMS

Post initial adoption, the success of LMS implementation can be measured by how sufficiently it addresses the needs of its stakeholders, including how well students and teachers can use it (Bouchrika, 2020; Dlalisa & Govender, 2020). The two main stakeholders of LMS are lecturers and students, with the *lecturers'* role being that of driving learning, while the *student's role being to* consume learning content (Bradley, 2021; Mokhtar et al., 2018). While both these stakeholders are important in understanding LMS use, lecturers drive the extent of use as they initiate and facilitate communication with the learners, plan online activities for sessions, distribute learning materials, and set the expectations for student learning and engagement (Bradley, 2021). Dlalisa and Govender (2020), Mokhtar et al. (2018) argue that lecturers are the most important stakeholders in the effective utilisation of LMS as it is their responsibility to use the LMS to create an engaging, motivating, and enabling learning environment for students (Bradley, 2021). Lecturers are pioneers in LMS use and can almost be seen as system influencers because if they didn't use it for their teaching activities, students would not see a need to use it too. Hence, Tristiana and Kayyis (2022) argue that the benefits of LMS can only be fully realised if lecturers needs are being met (Fathema & Akanda, 2020) so that the LMS features provided can be maximised.

2.4.1 Lecturers' Pedagogical Beliefs

Lecturers tend to hold different beliefs about how to effectively teach their subject areas (Alburo, 2019). Gurer (2021) contends that pedagogical beliefs play an important role when integrating technology into teaching and they largely link to how instructors perceive technology in teaching.

Different pedagogical beliefs range from being *constructivist* where an instructor uses a democratic approach creating an environment where students discuss, argue, solve problems, explain, collaborate among each other and the instructor (Alburo, 2019) to *traditionalist* where teaching and learning consists of a structured, content-based, teacher controlled environment that regards

students as passive recipients of information (Alburo, 2019). Much of the educational technology research claims that lecturers who possess constructivist beliefs are more inclined to incorporate technology and digital tools in more student-centered ways as they see technology as a supporting tool (Tan & Hew, 2019; Tondeur, van Braak, Ertmer & Ottenbreit-Leftwich, 2017), whereas those with traditional beliefs usually do not perceive technology as useful and essential for teaching, and therefore tend to integrate technology into classroom practices in more supporting roles (Gurer, 2021; Tondeur et al., 2017).

2.5 Literature review conclusion

This section first reviewed technology use in the general context, followed by how technology is used in the education sector. Following that, an LMS overview was provided, including its different features and available types. Next, benefits and challenges of using LMS from a lecturers' perspective were discussed. The section concluded by giving an analysis of the role lecturers play in the LMS eco system.

Based on the literature reviewed it is evident that LMSs play a vital role in the evolving educational context and that lecturers' roles are key to their success. Therefore, this research aimed to understand the attitudes, beliefs, experiences, and pedagogical beliefs of lecturers in relation to LMS. The Conceptual Frameworks (CF) considered, and the CF subsequently selected for the study is discussed in the next section.

3. CONCEPTUAL FRAMEWORK

According to Varpio, Paradis, Uijtdehaage and Young (2020), a conceptual framework (CF) guides the research process and identifies the variables and possible relationships in order to describe the research phenomenon. As this study aims to understand more about lecturers' use of LMS in a South African university with COVID-19 as the context, a suitable CF that considers individual attitude and beliefs, technology, technology competency, and teaching style is needed.

This section provides an overview of commonly used frameworks used to understand individual use of technology. These include: Task Technology Fit (TTF) (Goodhue & Thompson, 1995); Theory of Planned Behaviour (TPB) (Ajzen, 1991); and Will Skill Tool Pedagogy model (WSTP) (Christensen & Knezek, 2001). Each framework is briefly presented, along with a description of studies where each framework has been used. Thereafter, reasons for non-selection or selection are provided. Lastly, the application of the selected CF for the study is presented in relation to the research questions.

3.1 Task-technology fit (TTF)

Task Technology Fit (TTF) is a popular model developed by Goodhue and Thompson (1995) to explore technology utilisation through assessing the fit of technology to users' tasks or requirements. Spies, Grobbelaar and Botha (2020) describe TTF as a model that allows researchers to measure effectiveness of a technology through measuring the connection between the technology and the tasks the technology aims to support. TTF asserts that characteristics of both the task and technology can affect the fit of the task and technology, which ultimately determines users' performance and utilisation (Goodhue & Thompson, 1995). TTF uses three core determinants to predict utilisation and performance impact i.e., Technology characteristics, Task characteristics and Task-Technology Fit (Goodhue & Thompson, 1995; Wan, Xie & Shu, 2020).

Task characteristics describe features of a task that can be accomplished by use of technology (Goodhue, 1998), specifically broken down into detail according to the complexity of the task (Goodhue, Klein & March, 2000); *Technology characteristics* describe the tools i.e. hardware or software employed by individuals to execute their tasks (Goodhue & Thompson, 1995; Spies et al., 2020); and *Task-technology fit* describes the degree to which the technology being utilised meets the needs of the tasks being performed by an individual (Goodhue & Thompson, 1995). According

to Goodhue et al. (2000) better performance results from technology tools possessing appropriate functionality and features are needed to complete the required actions for a task.

3.1.1 Use of TTF

According to Lu and Yang (2014), TTF has been extensively used to evaluate how technology-fit leads to improved performance and usage effect. Within education, TTF has been applied in a range of topics including acceptance of MOOCS in developing countries (Khan, Hameed, Yu, Islam, Sheikh & Khan, 2018), online learning usage within higher education (Isaac, Aldholay, Abdullah & Ramayah, 2019), e-learning continuance satisfaction in higher education (Al-Samarraie, Teng, Alzahrani & Alalwan, 2017) and more recently Navarro, Prasetyo, Young, Nadlifatin, and Redi (2021) used TTF to study the satisfaction of using LMS in the engineering faculty.

3.1.2 Reasons for not selecting TTF

Notwithstanding its wide application, Aljukhadar, Senecal and Nantel (2014) mention that as TTF was originally developed to predict organizational performance and utilisation of technology, consideration of individual users is ignored. Furthermore, Khan et al. (2018) mention that TTF is primarily concerned with how technology affects performance by matching the task and technology characteristics, with little consideration of internal constraints that may limit technology use. As this study aims to understand lecturers' perceptions, experiences and extent of use for LMS, TTF is not seen as the most suitable CF for this study.

3.2 Theory of planned behaviour (TPB)

TPB was developed by Ajzen (1991) as an extension of rational behaviour theory to address attitudes and individual behaviour in a specific social context by integrating internal and external factors that guide one's behavioural intention. TPB is founded in the notion that behaviour is rational and thus, one's intention to behave directly influences enacted behaviours (Ajzen, 1991).

According to Ajzen (1991) behavioural intent is comprised of various factors: attitude, subjective norm, and perceived behavioural control. Archie, Hayward, Yoshinobu and Laursen (2022) and Renzi and Klobas (2008) describe *Attitude* as a person's favourable or unfavourable perception of a behaviour; *Subjective norm* as an individual's perception of their peers' approval or disapproval of a behaviour and *Perceived behavioural control* as an individual's perception of their ability to

perform a behaviour. Together, these three elements jointly determine intention to engage in a behaviour (Ajzen, 2002).

3.2.1 Use of TPB

A number of Information Systems (IS) studies have applied TPB on its own (Hadadgar, Changiz, Masiello, Dehghani, Mirshahzadeh and Zary, 2016; Rana, Slade, Kitching and Dwivedi, 2019; Archie, Hayward, Yoshinobu and Laursen, 2022) while others have used it in conjunction with other models to predict adoption and use behaviour of various internet-enabled technologies (Akour, Alshurideh, Kurdi, Ali and Salloum, 2021).

Rana et al. (2019) utilised the extended version of TPB to understand students' cyberslacking intentions; Archie et al. (2022) investigated the linkage between professional development and mathematics instructors' use of teaching practices using TPB; Hadadgar et al. (2016) used TPB to explain general use of e-learning in continuing medical education and Akour et al. (2021) used a combination of TPB and TAM to predict people's intention to use mobile learning platforms.

3.2.2 Reasons for not selecting TPB

According to Kan and Fabrigar (2020), TPB aims to predict behavioural intentions, however as this study is not aiming to predict, but rather to understand lecturers' extent of use of LMS technology for hybrid learning, TPB is not seen as suitable. Furthermore, TPB claims that individuals make decisions by evaluating the costs including time and effort as well as benefits of different courses of action and then choose the option that maximizes their expected net benefits (Al-Mamary, Al-nashmi, Hassan & Shamsuddin, 2016). In the case of this research, lecturers do not have the option to decide whether or not to make use of the LMS as LMS use is mandated by the university, therefore TPB which is a rational choice model (Al-Mamary et al., 2016) is not a suitable model as lecturers do not have a choice.

3.3 The Will–Skill–Tool-Pedagogy Model (WSTP)

WSTP is a prominent model that has been widely applied in research exploring education and technology (Tondeur, Petko, Christensen, Drossel, Starkey, Knezek & Schmidt-Crawford, 2021). The original version of WSTP, developed by Christensen and Knezek (2001), consisted of three

constructs: Will, Skill and Tool which are considered imperative in describing technology implementations in educational contexts (Knezek, Christensen, Hancock & Shoho, 2000).

According to the WST model, the integration of technology in education is influenced by the individual's: *Will* which refers to the attitudes and beliefs they have towards the technology (Farjon, Smits & Voogt, 2019); *Skill* referring to individual's ICT competencies (Knezek et al., 2000); and *Tool* which addresses availability and accessibility of ICT resources (Knezek & Christensen, 2016). Sasota, Magadia and Cristobal (2021) contend that these identified factors are essential elements for a successful integration of technology into teaching. The most recent version of the model, WSTP, added *Pedagogy* as a factor, to describe the teaching style and teachers' level of confidence using the technology (Knezek & Christensen, 2016; Tondeur et al., 2021).

3.3.1 Use of WSTP

Several studies have successfully used WSTP model to analyse the integration of technology in teaching. For instance, Farjon, Smits and Voogt (2019) used WSTP to investigate technology integration of pre-service teachers; Sasota et al. (2021) used WSTP to study technology integration in teaching science and mathematics; Woltran, Lindner, Dzojic and Schwab (2022) looked at digital media implementation in education; and Sawyerr and Agyei (2022) explored teachers' use of ICT as a classroom instruction for mathematics. Findings from these studies suggest that constructs of WSTP are interrelated and equally influence technology integration (Wijnen, Walma van der Molen & Voogt, 2021). For example, the Skill construct negatively influences technology (Modise & Molotsi, 2022; Mpungose, 2020a) because even if teachers are willing to use the technology, their inability to navigate the tool will hinder their integration efforts. Similarly, access, availability, and features of the Tool also influence technology integration (Mpungose, 2020a; Multazam et al., 2022; Agyei, 2021), with absence of these resulting in lecturers not using the technology (Multazam et al., 2022). In most of these studies, researchers claim that WSTP ensures that no single factor aspect of the model is considered, without addressing the others (Agyei, 2021; Farjon et al., 2019; Mpungose, 2020a; Multazam et al., 2022; Sasota et al., 2021; Sawyerr & Agyei, 2022; Woltran et al., 2022).

3.3.2 Reasons for selecting WSTP

WSTP has been selected as the most suitable CF for this research for various reasons. Firstly, WSTP was specifically developed to explain technology integration within teachers. Therefore, as this

study aims to understand more about lecturers' use of LMS in a South African university with COVID-19 as the context, WSTP is a valuable model as it offers multi-dimensional approach in explaining technology integration in teaching (Sasota et al., 2021). Secondly, WSTP provides a way in which both internal i.e., will, skill, and pedagogy, and external issues i.e., tool, can be understood. Thirdly, even though the model only contains four constructs, Tondeur et al. (2021) claim WSTP incorporates multiple measures that contribute to its quality and depth. Lastly, WSTP is also seen as a parsimonious and simple model (Velázquez, 2006) making it easy for researchers to apply.

3.4 Conceptual Framework – Application to WSTP

The Will, Skill, Tool, Pedagogy (WSTP) model was developed to study the integration of technology in educational contexts (Woltran et al., 2022). Its constructs, according to Knezek and Christensen (2016) include: *Will* (attitude towards the technology); *Tool* (availability and accessibility of the tool) and *Skill* (competency to utilize the technology) and Pedagogy (describing the teaching style). Figure 3.1 provides a diagrammatic representation of the WSTP model.

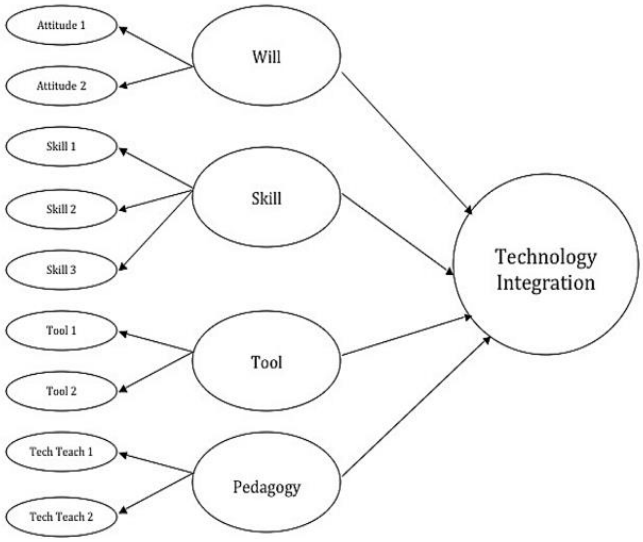


Figure 3.1: WSTP Model of technology integration (Knezek & Christensen, 2016)

3.4.1 Will factor

Knezek and Christensen (2016) and Farjon et al. (2019) describe *Will* as a positive attitude and belief towards the use of technology for instructional purposes. Amongst other factors influential

in the successful integration of computers in the classroom, the attitude of teachers towards the technology is believed to be key (Gyamfi, 2016; Huang & Liaw, 2005; Wambiri & Ndani, 2016; Knezek, Christensen & Fluke, 2003). Similarly, according to Bowman, Vongkulluksn, Jian and Xie (2020), Ottenbreit-Leftwich, Kopcha and Ertmer (2018) lecturers' beliefs about good teaching practices and the value of technology in learning shape their technology use. If lecturers realise the benefits in using technology, they are most likely to open themselves up to it and incorporate it into their teaching activities irrespective of their pedagogical style (Govender & Govender, 2014). Andersson (2008) concurs that several lecturers continue to use technology because it helps them achieve their goals much more effectively than using traditional techniques. In contrary, the use of technology can also present lecturers with challenges which end up posing insecurities and consequently affecting the attitude towards its use (Govender & Govender, 2014).

Therefore, in the study in order to answer sub-question (1) *what are different lecturers' beliefs and attitudes towards LMSs?* 'Will' will be used to understand lecturers' attitudes, beliefs, how they benefit from using the LMS as well as their challenges.

3.4.2 Skill factor

Knezek and Christensen (2016) describe skill as a person's ability, competency and experience with technology including self-efficacy. Self-efficacy refers to individuals' belief about their abilities to produce desired behaviour (Bandura, 1994). In an educational context, Corry and Stella (2018) refer to self-efficacy as what educators believe can be achieved with technology and how they believe they can manage to carry out their work with the technology. A technology skill is most established through professional development such as training (Sawyerr & Agyei, 2022) and can also grow through experience (Khalimov & Soliddinova, 2021). In regard to LMS, while many lecturers acknowledge the benefits of the system, various studies report training and subsequent skills needed to use the LMS as major challenges which discourage use of the tool (Dlalisa & Govender, 2020; Mpungose, 2020a). Agyei (2021) claims that the most important factor influencing technology integration in classrooms is lecturers' competence in using the tool. It is believed that appropriate skills promote increased technology use (Knezek & Christensen, 2015; Sawyerr & Agyei, 2022).

Therefore, in the study in order to answer sub-question (2) *what are different lecturers' skills and level of experience in regard to using LMSs?* 'Skill' will be used to understand lecturers' skills and experience using LMS.

3.4.3 Tool factor

The *Tool* factor describes the access and availability of technology (Knezek & Christensen, 2016), as well as the extent of technology use (Farjon et al., 2019). Wenzel and Moreno (2022) argue that for online learning to be successful, technology must not only meet institutional goals, but must also cater to individual needs by providing technology that is accessible. Restricted access to useful, relevant, and appropriate software and hardware; institutional and technical support to assist and maintain the technology are factors that affect successful integration of technology into the classroom (Velázquez, 2006). While access and availability are crucial for integration (Agyei, 2021), if LMSs do not have the required features to support educator's needs and the specific requirements for certain subject, integration will not occur (Mhungu, 2018; Mpungose, 2020a).

Therefore, in the study in order to answer sub-questions: (3) *what features are available on the LMS*? and (4) *what are different lecturers' perceptions of benefits and challenges of using LMSs?* 'Tool' will be used to understand availability of features that lecturers' need for their subject areas.

3.4.4 Pedagogy

According to Knezek and Christensen (2016), pedagogy describes a lecturers' teaching style and how efficiently technology is applied by the lecturer. Educators adopt different beliefs which ultimately influence how they use and integrate technology within the classroom (Tondeur et., 2017). Pedagogical beliefs stipulate beliefs and attitudes that educators have regarding their philosophy of what teaching is and how it should be conducted (Gyamfi, 2016). Notably, lecturers' pedagogical beliefs are observed to be strong predictors of technology use (Inan & Lowther, 2010; Miranda & Russell, 2012), with teachers tending to select technology and applications that align with their existing beliefs about what constitutes good education (Tondeur, 2019; Tondeur et al., 2017). Tondeur (2020) states that pedagogical beliefs exist as either traditional or constructivist views (Deng, Chai, Tsai & Lee, 2014; Sulaiman, Mahomed, Abd Rahman & Hassan, 2019), with traditionalists being less inclined to using technology in their teaching (Windschitl & Sahl, 2002) while constructivist are more open to the use of technology in the classroom (Ertmer, Ottenbreit-Leftwich & Tondeur, 2016). Even though higher education lecturers positively engaged in

eLearning activities during COVID-19, Giovannella and Passarelli (2020) found that they were likely to revert back to traditional pedagogical ways once the pandemic was over despite the benefits that technology has brought into their teaching activities. The reluctance to fully embrace technology integration demonstrates the impact that pedagogical beliefs have in practise (Deng et al., 2014). Even though pedagogical beliefs may prove to be difficult to change (Teo, Huang, and Hoi, 2017) due to being embedded in educator's teaching style, Fives and Gill (2014) argue that beliefs that are newly developed are more likely to change. Additionally, lecturers' beliefs are important as they influence the extent of LMS use and success within institutions (Jung & Huh, 2019; Mhungu, 2018).

Therefore, in the study in order to answer sub-question (5) *what are different lecturers' style of teaching?* 'Pedagogy' will be used to understand the lecturers' style of teaching and their belief system in regard to integrating technology into the classroom.

The application of the WSTP model for this research is depicted in Figure 3.2.

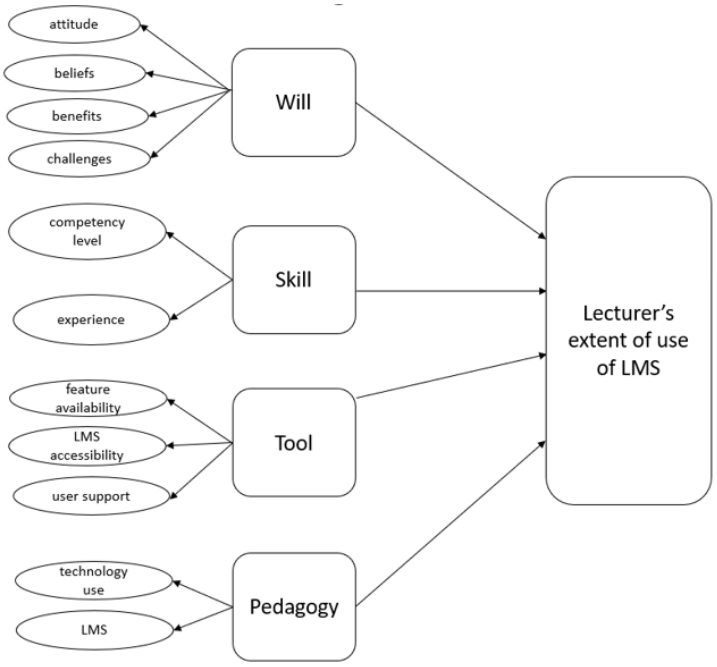


Figure 3.2: WSTP adopted for Conceptual Framework

3.5 Conceptual framework conclusion

This section first presented an overview of the TTF model followed by its application in different studies. Next, reasons why it was not selected for this study were discussed. Following that, an overview of the TPB model was presented followed by its application and reasons why it was not selected. Next, WSTP model was discussed followed by its application and the reasons it was selected for this study. The section concluded by presenting the WSTP model as the adopted conceptual framework, followed by a comprehensive discussion of its four factors i.e. Will, Skill, Tool, and Pedagogy.

4. RESEARCH METHODOLOGY

According to Sileyew (2019), a research methodology sets the path through which a research will be conducted. To provide details on the research methodology to be used for the research, this section begins by presenting the research paradigm and approach. Next, research design and strategies are discussed, followed by participants, sampling strategy, and data collection process. Lastly, data analysis methods, evaluation criteria, and ethical considerations are presented. For each part of the research process presented, rationales are given for choices made.

4.1 Research Paradigm

Saunders, Lewis and Thornhill (2009) describe research process as an onion consisting of multiple important layers that lead to the centre of research. The outer layer of this process represents research philosophy which relates to the nature and development of knowledge in a piece of research (Saunders et al., 2009), also referred to as the research paradigm. Mhungu (2018) describes research philosophies as underlying beliefs and assumptions upon which worlds perspective and worldviews are built, adopted to guide the design and execution of a research study (Tamminen & Poucher, 2020). A paradigm portrays a world view, that is influenced by philosophical assumptions about the nature of social reality (Schwandt, 2001). Some of the broadly applied paradigms include positivism, interpretivism, and pragmatism (Kankam, 2019; Saunders, Lewis & Thornhill, 2007).

Positivism research studies rely on knowledge being objective, using structured research instruments (Orlikowski & Baroudi, 1991). Fundamentally, a positivist researcher is concerned about measuring phenomena with the aim of discovering the objective reality (Orlikowski & Baroudi, 1991). In *interpretivist paradigm,* a researcher is required to understand the subjective meaning of social action (Bryman, 2008) as there is no universal truth worldview (Kankam, 2019). In addition, interpretivism is concerned with studying how human beings make sense of the events happening around them (Chilisa, 2011). Lastly, the *pragmatic paradigm* is related to action, practical relance and constructive knowledge interaction (Goldkuhl, 2012), with the belief that these elements are key constructs in social research.

An interpretivist philosophy is most suited, as this study aimed to understand more about lecturers' use of LMS in a South African university with COVID-19 as the context. Furthermore, as this study intended to understand LMS use through lecturers' individual actions and experiences, an

interpretivist philosophy that endeavours to understand their individual human experience (Cohen, Manion & Morrison, 2007), was selected.

4.2 Research Approach

Babbie (2013) describes the research approach as the method of uncovering what is already known about a particular field of study, including the techniques of how the information will be discovered. In an interpretivist paradigm, commonly used research approaches include qualitative and mixed methods research (Creswell, 2014; Mhungu, 2018). According to Creswell (2014), a *qualitative* approach aims to explore and understand the meaning that individuals or groups attribute to a social or human problem, while a *mixed methods* approach uses a combination of qualitative and quantitative approach either concurrently or sequentially, to generate new knowledge (Stange, Crabtree & Miller, 2006).

As this study aimed to understand more about lecturers' use of LMS in a South African university with COVID-19 as the context, a qualitative approach was selected as it offers the most appropriate means in which to understand the experiences of lecturers using LMS in higher education institutions.

4.3 Research Design

Research design, also referred to as a strategy of enquiry, is a plan that provides specific direction as to how the data will be collected, analysed, interpreted, and reported (Denzin & Lincoln, 2011; Grover, 2015). According to Cohen et al. (2007), the design entails formulating questions, selecting appropriate methodologies and approaches for data collection and analysis, constructing instruments for data collection, choosing participants and sample, addressing quality and ethical issues, reporting and interpreting findings. Within qualitative research, strategies differ according to the way in which data is collected and analysed, and these include ethnography, phenomenological research, and case studies (Creswell, 2014).

In an *ethnographic study*, a researcher seeks to understand social and cultural views, perspectives, and actions (Hammersley, 1985; Reeves, Peller, Goldman & Kitto, 2013). While ethnographic research enables the researcher to see first-hand how users interact in their natural setting (Reeves et al., 2013), they take considerable time as the researcher needs to be immersed in the participant's world (Khan, 2018). In *Phenomenological* research, a researcher describes experiences of

individuals pertaining to a specific phenomenon as described by participants through prolonged engagements (Creswell, 2014; Moustakas, 1994). Phenomenological research design generally entails conducting interviews (Moustakas, 1994). Lastly, *case studies* are concerned about generating an in-depth understanding of an event/events in real-life context, within a particular time, and embedded in a specific physical and social context (Crowe, Cresswell, Robertson, Huby, Avery & Sheikh, 2011; Stake, 1995).

As this study aimed to understand more about lecturers' use of LMS in a South African university with COVID-19 as the context, a case study research strategy was used as it allows for a deep investigation of a research phenomenon in a specific setting within a specific period (Bhattacherjee, 2012).

4.3.1 Case Study research approach

Creswell (2007) describes a case study as an investigation that examines a phenomenon in its real-life setting. According to Yin (2017), a case study is particularly suitable when research questions include how and why questions and the researcher has no control around the events. Furthermore, Cohen et al. (2007) indicate that the purpose of a case study is to epitomise, analyse and interpret the exclusivity of actual individuals and situations through accessible events. The units of analysis in a case study is not limited to individuals, but can be single units, teams, or communities (Gustafsson, 2017). As this research aims to understand how lecturers make use LMS in South African university, a case study research strategy was selected.

4.3.2 Case study site

The selection of a case study site should consider the aims and objectives of the study, thus guiding the researcher as to the most suitable place to collect data so that the posed research questions can be answered (Stake, 1995; Yin, 2014). Additionally, accessibility of the chosen population is another consideration that influences selection of a case study site (Crowe et al., 2011).

As this study aimed to understand LMS use amongst lecturers in a South African university, a university actively using LMS was considered. After reviewing the 26 public universities in SA (DHET, 2022), a well-established university was selected as a case study site for this research focusing at two different faculties so that lecturers' perspectives and experiences which may differ between these faculties could provide a more in depth understanding of the research topic (Baxter

& Jack, 2015). Reasons for the selection of this university is that the university is well ranked in South Africa; a public multi-campus institution that has been using LMS for more than 17 years; lecturers' familiarity with LMS due to prior use; university's continuance of LMS use post COVID-19; and the researcher's accessibility to the institution.

4.3.2.1 Selected University

The university selected is a well-established higher academic institution ranked amongst the top universities in the world. This university is primarily a contact university where classes are held in person. Prior to Covid-19 for 17 years, the university used LMS to support contact learning by providing a platform where lecturers could electronically distribute course content, manage assignment submissions, student-lecturer communications and conducting tests. Due to Covid-19 lockdown restrictions and all studies being moved online, the LMS was later upscaled to be cloud based to allow simultaneous multiple user access and high demand. Currently, this university caters for online learning through the modern cloud based LMS which enables lecturers to remotely create learning experiences to promote a comprehensive lecture and student engagement online.

4.3.3 Participants

Alvi (2016) describes participants as all the members of the target population who meet the criterion specified for the research investigation. Population can consist of individuals, groups, companies, movements, artefacts, institutions, or countries (Neuman, 2011). Eldredge, Weagel and Kroth (2014) emphasise that all qualitative research designs concerning human subjects should define the study population so that eligibility of individuals participating in a study can be determined. Eldredge et al. (2014) further contend that the defined population then subsequently becomes the foundation for employing research results in other related populations.

For this study, all lecturers within the selected university represent the target population where the sample that represents the research population was drawn.

4.3.4 Sampling

Sampling is a method of selecting a representative subset of the research population in order to make the research more accurate and economical (Showkat & Parveen, 2017). Adopting a sampling

strategy in a research ensures that research participants are sampled in a manner that is representative of the population (Alvi, 2016). According to Showkat and Parveen (2017), available modes of sampling include probability and non-probability sampling.

According to Bhattacherjee (2012), Showkat and Parveen (2017), *probability* sampling is a method that chooses an eligible number of participants from a population when the researcher knows the exact number and location of the population elements, with every member having an equal chance of being selected. While probability sampling reduces sample biasness (Denscombe, 2010), it emphasises statistical accuracy (Mhungu, 2018). On the other hand, *non-probability* sampling selects the sample and participants because they are best suited to provide insights into what the research wants to achieve (Showkat & Parveen, 2017). One non-probability sampling technique is purposive sampling, which targets participants using a specific criterion of selection that will be beneficial in achieving the purpose of the study (Alvi, 2016; Yin, 2011).

As this study aimed to understand lecturers' use and extent of use of LMS in a South African university, non-probability purposive sampling which selects participants according to a specific criteria beneficial to achieve the intent of the study (Alvi, 2016; Yin, 2011) was employed. This enabled the researcher to purposely sample both lecturers who use and do not use the LMS in order to understand their experiences and extent of use. Specifically, participants were drawn from lecturers within a technology faculty i.e., Commerce, Law, and Management (CLM) and a creative arts faculty i.e., Humanities (HMT). The rationale for the selection of these different faculties is that, in CLM requirements for a post include computer related qualification/s, and thus the issue of limited computer skills and the resulting anxiety and challenges that are associated with using technology for learning will be minimized (Modise & Molotsi, 2022; Dlalisa & Govender, 2020), while in HMT requirements are more creative and philosophical making them less familiar with technology use.

- ***Sample size***

In qualitative research, the sample is determined based on having sufficient data in order to provide richly textured information about the research phenomenon (Vasileiou, Barnett, Thorpe & Young, 2018). Sandelowski (1995) recommends that while qualitative research sample sizes should be large

enough to allow the researcher to unfold new and deep understandings of the research phenomenon being investigated, they need to be small enough not to preclude deep data analysis. For this research, saturation was used as a guide to determine suitability of the research sample (Sandelowski, 1995; Morse, 2015). According to Francis, Johnston, Robertson, Glidewell, Entwistle, Eccles and Grimshaw (2010) saturation is a substantial indicator that signifies that the collected data reflects enough depth of the issues being studied within that sample to show validity.

To ensure that sufficient data was collected to provide a rich description of the research problem, the sample size was envisaged to be between eight to ten participants which is in the same range as the number used in a similar study by Modise and Molotsi (2022) where eleven lecturers were purposely selected to understand new lecturers perceptions towards LMS. However, the researcher stopped at participant number nine as no new information was being presented. This is in accordance with Fusch and Ness (2015), Lincoln and Guba (1985) who contend that the number of participants is guided by the informational redundancy principle which contends that sampling and data collection ceases when there is no new information coming from subsequent respondents, i.e., saturation has been reached.

4.3.5 Data Collection

Data collection involves systematically gathering information to assist researchers in answering research questions (Yin, 2011). In qualitative research, data collection methods include interviews, questionnaires, and observations. *Interviews* refer to an in-depth conversation with people who are considered knowledgeable about the research topic (Sileyew, 2019); *a questionnaire* is where a researcher develops a set of standardised questions following a fixed structure about a research topic (Trobia, 2022); and *observations* involves a researcher systematically looking and listening to actions and discourse participants (Smit & Onwuegbuzie, 2018).

According to Yin (2011), selection of the most appropriate method is mainly determined by the research methodology and the field of study (Fox & Bayat, 2008), with researcher needing to decide which method will return the most meaningful data to answer the defined research questions (Creswell, 2007). Furthermore, Kvale (2003) contends that interviews elicit rich narratives which facilitate investigation into people's views. Therefore, as this study aimed to understand lecturers'

use of LMS, interviews were used to collect data so that lecturers' experiences of the LMS could be better understood.

- **Interview types**

Creswell and Creswell (2018) describe interviews as in-depth individual conversations about participant's lived experiences. The three types of interviews include structured, unstructured, and semi-structured interviews (Gill, Stewart, Treasure & Chadwick, 2008). *Structured* interviews use questions that have been pre-planned (Mathers, Fox & Hunn, 1998) with no ability to probe further (Gill et al., 2008) while *unstructured* interviews have no structure nor are they necessarily linked to the research questions or selected theory (King, Horrocks & Brooks, 2019); and *semi-structured* or "in-depth" interviews enable the interviewer to utilise pre-determined questions, but also to deviate and probe further to seek greater understanding (Creswell & Creswell, 2018; Bhattacherjee, 2012).

Therefore, as this research aimed to understand lecturers' use and experiences of the LMS, semi-structured interviews were used. Interview questions were constructed in relation to the research questions and conceptual framework selected for the study (see Appendix B for Draft protocol and Appendix C for Sample transcript).

4.4 Data Analysis

Data analysis in qualitative research involves organising the data through a process of coding and ultimately representing the data in a form of either figures, tables, or a discussion (Creswell & Creswell, 2007). This section presents a brief overview of data analysis methods that were considered and selected for this research.

4.4.1 Analysis Methods

Data analysis methods in qualitative research include thematic and content analysis. In *thematic analysis*, data is segmented, categorized, summarized, and reconstructed in a way that captures the important concepts within the data set (Given, 2008), while content analysis involves coding and categorisation of large amounts of textual data to determine trends and patterns (Bless & Higson-Smith, 1995; Grbich, 2007). According to Bloor and Wood (2006) content analysis intends to define important characteristics of the document's content by carefully examining specifics such as what was said, by whom, with what effect, to whom. In content analysis, a descriptive approach is used

to code data as well as interpret counts of the codes (Morgan, 1993). However, Bless and Higson-Smith (1995) argue that coding for the content analysis methods take long and is prone to mistakes. While the thematic analysis method also has potential to cause inconsistency and incoherence in findings (Holloway & Todres, 2003), Braun and Clarke (2006) contend that its flexibility makes it a better and attractive choice especially for first time researchers. As thematic analysis enables researchers to map out meanings, reality and experiences of participants (Nowell, Norris, White and Moules, 2017), it was seen as the most suitable data analysis method for this study. In addition, as this study aimed to understand more about lecturers' use of LMS in a South African university with COVID-19 as the context, a thematic analysis was used to assemble collected data into a meaningful format (Fossey, Harvey, Mc Dermott & Davidson, 2002) including categorising answers into themes and sub-codes (Akbayrak, 2000).

4.4.2 Thematic Analysis Process

Thematic analysis is extensively used in qualitative research (Braun & Clarke, 2006; Nowell et al., 2017), its goal is to read through the dataset to identify and interpret key patterns as guided by the research questions (Clarke & Braun, 2017; Crowe, Inder & Porter, 2015). Thematic analysis is largely complemented for being flexible and highly modifiable to suit the needs of different studies while maintaining a detailed and rich account of data (Braun & Clarke, 2006). Braun and Clarke (2006) further contend that thematic analysis provides a more accessible form of analysis especially to researchers that are just starting out as it does not demand comprehensive theoretical and technological knowledge of other qualitative approaches.

As such, this research adopted Braun and Clarke (2006) framework as shown in Figure 3, as a guide to the thematic analysis process. Maguire and Delahunt (2017) complements this framework as being the most dominant in social sciences since it provides a clear and usable structure for undertaking thematic analysis.

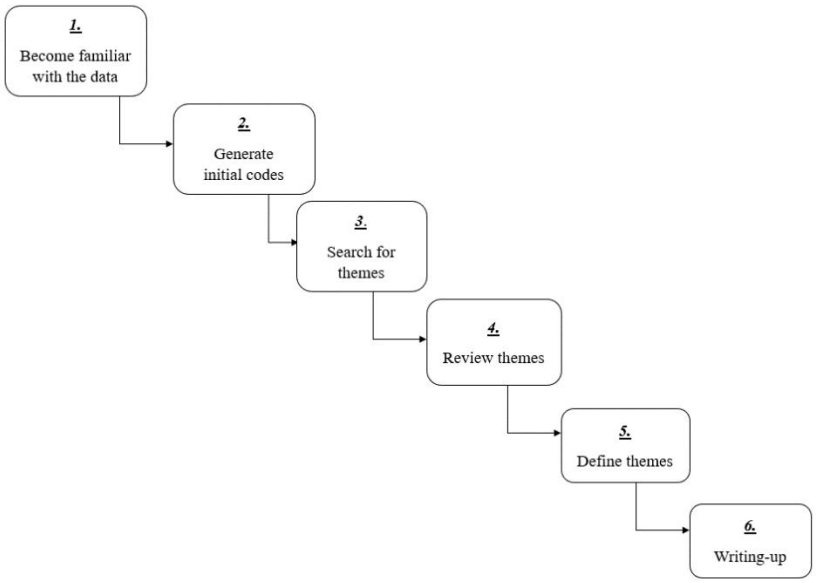


Figure 3.1: Thematic Analysis Process based on Braun and Clarke (2006)

First, the researcher familiarised themselves with data by reading through the interview transcripts. Secondly, the researcher systematically organised data into small chunks of codes. In the third step, the researcher captured what was seen to be significant relating to the research questions. In the fourth step, the researcher reviewed the themes that were identified in step 3 to ensure they aligned to the objectives of the research. In the fifth step, the researcher refined the themes identified in the earlier steps to make sense of what they were about (Braun & Clarke, 2006). In the final step, the researcher produced a report illustrating results of the analysis.

4.5 Evaluation criteria

In qualitative research studies, as the researcher is directly involved in the collection and analysis of data, there is potential for researcher bias (Galdas, 2017; Miles & Huberman, 1994). Mason (2002), Berger (2015) further contend that in qualitative studies, the researcher's voice can dominate as personal beliefs and interests of the researcher can easily be imposed. For these reasons, Chowdhury (2015) states that measures ensuring trustworthiness must be considered. In qualitative research, indicators of trustworthiness include credibility, transferability, dependability, and confirmability (Chowdhury, 2015; Lincoln & Guba, 1985).

4.5.1 Credibility

Tobin and Begley (2004) state that credibility is achieved when the researcher's representation matches that of respondent's views. To achieve credibility, Lincoln and Guba (1985) suggest that peer debriefing and member checking be used. Peer debriefing technique provides an external check of the research process (Lincoln & Guba, 1985), while member checking involves the researcher validating, verifying, and assessing the trustworthiness of qualitative results with research participants (Doyle, 2007).

To ensure credibility, interview questions for the study were derived and aligned with the conceptual framework.

4.5.2 Dependability

Dependability refers to the degree to which same results would be attained, to an extent that if the research were to be redone under the same context, using same participants and methods (Chowdhury, 2015; Shenton, 2004). As a measure to ensure dependability, Guba (1981), Shenton (2004) propose using an audit trail, which provides evidence of choices and decisions made throughout the study (Koch, 1994).

In order to assure dependability, the study reports in detail the data collection and analysis phases and subsequent findings, with verbatim transcriptions of the interviews.

4.5.3 Transferability

Nowell et al. (2017) describe transferability as the ability to generalise an inquiry to a wider population (Shenton, 2004), with the ability to transfer from case to case. In qualitative studies, Tobin and Begley (2004), Morrow (2005) suggest that for researchers to achieve transferability, they need to comprehensively document the research context including all processes utilised in the research.

In order to ensure transferability, a comprehensive description of the research context is provided in this study.

4.5.4 Confirmability

Confirmability looks at 'objectivity' by assessing auditability and neutrality of a research (Chowdhury, 2015). According to Tobin and Begley (2004) confirmability establishes whether

conclusions, interpretations, and findings have been appropriately drawn from the research data and do not originate from the researcher's own predispositions (Shenton, 2004).

To assure confirmability, an audit trail is presented in this research to enable the tracing of the step-by-step research process, including decisions made and procedures described.

4.6 Ethical considerations

Ethics relate to the researchers' behaviour in relation to the rights of individuals who are impacted or are the subject of the research (Saunders, Lewis and Thornhill, 2016). To comply with the university's code of ethics, the researcher applied for clearance so that the research process and protocols used are in accordance with ethical principles specified by the university. Considerations in regard to informed consent, confidentiality and permission are as follows.

4.6.1 Formal participant consent

Irrespective of the research being carried out, research participants must be thoroughly informed about the research objectives and agree in writing in regard to the intended use of its findings, benefits, risks and methods (Creswell, 2007; Oates, 2006).

For this research, to ensure that participants were aware of the aims of the research and what their participation will entail, the intentions of the study were clearly communicated to participants in the information participation letter which explicitly stated the objectives of the study, ethical considerations, and the extent of their involvement participating in the research (See Appendix A-1 for Information Participation Letter). Additionally, a participant consent form was signed by each participant prior to the interview beginning (see Appendix A-2 for Informed Consent).

4.6.2 Confidentiality and anonymity

Bhattacherjee (2012) and Coffelt (2017) contend that anonymity and confidentiality aspects are important in social research as they protect the privacy of the participants who voluntarily agree to participate in the research. However, anonymity can only be maintained in quantitative studies, with only confidentiality being assured in qualitative studies (Coffelt, 2017).

As interviews were used for this study, anonymity was not achieved, but to ensure confidentiality participant identities were not revealed to anyone besides the researcher and supervisor. In addition,

to report results only pseudonyms were used to report findings. Furthermore, the information collected for the purpose of this research will not be used for any other purpose and transcriptions of the interviews are saved in a password protected folder for a period of 3 years before it is discarded.

4.6.3 Permission

For the research to take place, permission to conduct the research needs to be explicitly granted (Gupta, 2013; Manandhar & Joshi, 2020). As this research involved lecturers within CLM and HMT faculties, permission was sought from the university, see (Appendix A-3 for permission letter). Only once permission was given and ethical clearance was granted, did data collection begin, see (Appendix A-4 for Ethical Clearance Certificate).

4.7 Research methodology conclusion

This section first discussed research paradigm, followed by the selected research approach. Next, research design and the case study research approach were discussed. Following that, an overview of data analysis was presented, followed by a discussion on analysis methods including thematic analysis process. Next, evaluation criteria overview was presented, followed by a discussion about how credibility, dependability, transferability, and confirmability was ensured. The section concluded by discussing ethical considerations followed, including a review of formal participant consents issued, followed by how confidentiality and anonymity was achieved, including the permission process that was followed.

5. FINDINGS AND DISCUSSION

As this study intended to understand lecturers' use and extent of use of LMS in a South African university during and post COVID-19 pandemic, the main research question is *What are lecturers' experiences of and extent of use with Learning Management Systems within tertiary education in SA during and post COVID-19?* To guide the conceptualisation, data collection and analysis in this study, Will, Skill, Tool, Pedagogy (WSTP) framework was used to explore how lecturers' attitudes, competency, access to the LMS and teaching style influence their subsequent use or non-use of LMSs. The section begins by providing a brief summary of the case study site and participants of the study. Next, findings are presented in relation to each of the sub-questions posed in relation to the WSTP framework.

5.1 Case Study Site

The university at which data was collected is a South African public tertiary face-to-face institution, ranked in the top 500 universities in the world. Prior to COVID-19, the university had already purchased, and was making use of a LMS to support and supplement functions such as electronic distribution of course material, student communication, and submission of assignments. However, during COVID-19, the university switched from being a face-to-face institution to using online learning as a primary approach. This resulted in the university's LMS being used more extensively by lecturers. In addition to the pandemic, during this time the university purchased a new LMS to meet the evolving needs of online and distance teaching and learning, which required lecturers to quickly adapt and adjust to the new system in order to continue the academic project.

5.2 Lecturers interviewed

To gather a detailed understanding of lecturers' experiences and extent of use of the LMS during and post COVID-19, in-depth interviews were conducted with nine lecturers at the university from two different faculties. As mentioned previously, the faculties of Humanities (HMT) and Commerce, Law and Management (CLM) were selected as lecturers in CLM seem to be more tech savvy due to the nature of the degrees as opposed to Humanities where degrees are more creative e.g., Arts, Theatre, Painting and Literature.

To collect data, initially emails were sent to faculty registrars which were then forwarded to lecturers in each faculty inviting them to participate. After interviewing the lecturers that responded,

snowball sampling was used with the researcher asking lecturers during the interview to recommend their peers who would be interested and available to participate in the research. This sampling method was employed as few lecturers responded to the initial email. Microsoft Teams was used to conduct interviews between December 2022 and February 2023 as this was more convenient for lecturers during this time in the academic year. This resulted in a total of nine interviews being conducted, as saturation i.e., no new information was provided with subsequent interviews, was reached (Fusch & Ness, 2015; Lincoln & Guba, 1985).

Table 1 presents a list of lecturers interviewed in regard to faculty, gender, and lecturing experience, Pseudonyms have been used to protect the identities of lecturers.

Table 1: Lecturers interviewed

Pseudonym	Lecturing Experience	Summarised Profile
Nadia	10 years	Nadia (CLM) is a highly skilled technology lecturer who believes the integration of technology offers many conveniences and thus should be embraced and lecturers need to adapt their teaching as it evolves. Nadia has a large amount of experience in using LMSs and feels that LMSs align with her way of teaching.
Santiago	15 years	Santiago (CLM) is a highly skilled technology lecturer who believes that even though the use of technology is highly dependent on the nature of the course itself, in principle he supports technology integration within education to enhance teaching and learning. However, Santiago cautions that technologies may limit educators who are not knowledgeable enough.
Tania	3 and a half years	Tania (CLM) is a highly skilled technology lecturer who feels very comfortable using technology and uses current technology at the university to assist her in running her courses. While Tania feels that technology enhances her teaching, especially during COVID-19 where technology came to the rescue of the academic project, she regards technology simply as an enabler.
Lizzie	29 years	Lizzie (CLM) is a senior and highly experienced lecturer within Information Systems division. While Lizzie believes that technology tools should be used to extend and enrich the teaching experience, she strongly believes that face to face is a better way of teaching than online.
Leona	27 years	Leona (CLM) is a senior technology lecturer with good technology skills. While Leona believes that technology is essential, especially for big classes, she feels that the main aim is to teach, and technology integration should only take place if it enhances teaching and does not inhibit teacher and student engagements.
Dineo	24 years	Dineo (HMT) is a senior lecturer in the fine arts department who believes she has just basic technology skills that enable her to use current technology at the university. Although her course is practical and studio driven, Dineo believes that digital tools are important, as they

		enable students to enhance their work to produce digital portfolios. In addition, she feels as students are already using different kinds of digital media, lecturers need to interact with, and integrate the technology in their courses.
Brenda	20 years	Brenda (HMT) is an experienced fine arts lecturer who believes she has good technology skills. While Brenda thinks technology is invaluable as it allows for visual projections, she believes technology use is not ideal when delivering lectures, seminars and carrying out studio work. Overall, Brenda feels that technology should mainly be used as a support mechanism and for administrative purposes.
Tina	15 years	Tina (HMT) is a senior lecturer with many years of teaching experience. While Tina thinks she has limited technology skills, she believes technology is a very important and reports that her department tries to keep up with technology advances in terms of how students use social media in relation to visual arts and photography. Despite her positive attitude towards technology and the benefits accrued from using technology during COVID-19, Tina claims that adjusting has been challenging.
Matthew	28 years	Matthew (HMT) is a senior lecturer in the Department of Theatre and Performance, who believes he has good technology skills. Matthew feels that technology can really enhance teaching, but says lecturers need to be conscious of the limitations and current resource failures that hinder technology integration efforts.

5.3 Will

In order to explore WILL, which describes lecturers' attitudes, beliefs, what benefits they believe they gain from using the LMS as well as their challenges (Knezek & Christensen, 2016), questions relating to their LMS views, their perceptions about LMS, experienced advantages and challenges and their attitudes about LMS were asked: (1) *Please describe your general views on LMSs*; (2) *Please explain whether your perception of LMSs have changed during and post COVID*; (3) *In your opinion, what are the advantages and challenges you have experienced using LMS;* (4) *Please explain what makes you enthusiastic or unwilling to use LMS*; and (5) *Please explain whether your experiences with using the LMS have motivated or demotivated you.*

5.3.1 Lecturer Beliefs

5.3.1.1 Prior to COVID-19

Before the pandemic, even though most lecturers believe that **using LMSs contributed positively to the teaching and learning process** "*they are very helpful…cater for the various aspects of a student's educational journey, what their needs are, as well as the academic use of it*"(Nadia-CLM); "*massive in terms of the big contribution they've made"* (Santiago-CLM); "*a central interface to teaching and learning*" (Dineo-HMT); *"it's a crucial tool"(Brenda-HMT),* some report that they used **limited functions** "*prior to COVID…LMS was not used to its maximum, it was just used as a*

resource sharing app, and more emphasis was based on contact consultations"(Nadia-CLM) as the LMS was **inflexible** *"previous LMS wasn't as flexible"(Nadia-CLM*), and **needed improvement** "*there's still a lot that can be improved"*(Dineo-HMT); "*they're not perfect*" (Tania-CLM).

5.3.1.2 During COVID-19

During COVID-19, lecturers report that the **immediate need to switch to an online only approach was challenging** "*the university insisted that we carry on…switch to online in a very short period of time*"(Dineo-HMT); "*we were thrown into the deep end, and it wasn't an easy thing*"(Tina-HMT), but according to Leona (CLM) the decision by the university to switch to a new LMS only amplified issues "*we changed LMS's in the middle of COVID…and we had to learn this whole new LMS at the beginning of 2021*" (Leona-CLM). Despite these challenges, lecturers indicate that they **learned a lot** during this time *"we had to learn"* (Tina-HMT); *"we learned a lot and we used it all"* (Leona-CLM) and began to **appreciate and rely more on the LMS** "*appreciation for LMS has increased over the years and during COVID it became more evident*" (Santiago-CLM); "*COVID made me more reliant on an LMS like never before*" (Tania-CLM); "the *LMS saved us during COVID, I don't think we could have functioned without it*" (Leona-CLM). Furthermore, some lecturers report that their **curiosity and exploration of different functions and capabilities** of the LMS grew significantly during this time, "*definitely saw more value in LMSs in the pandemic*" (Brenda-HMT); *"made me see more of the value that an LMS offers to educators…functionality that is there…before COVID I wasn't using…with COVID I was forced to explore the functionality to the max*" (Tania-CLM).

5.3.1.3 Post COVID-19

Post COVID-19, with the move to a more hybrid approach to education, opinions as to LMS use seem varied. One lecturer indicates that she is **not using as many of the LMS' functions** as during the pandemic "*I'm finding that some of the stuff that really worked during COVID because online was the only option, is not really working now because it's not the only option*" (Leona-CLM), **prefers to be in person than online** "*post COVID-19, I'd say that I haven't used discussions, for example, because we've been having in class discussions"* (Leona-CLM); "*now that we are post Covid, I try to do more during our contact sessions*" (Dineo-HMT), while others claim they are

using the LMS more than they did prior to COVID-19 "*I wouldn't say my perception has changed, but certainly I'm making better use of the LMS than I did in COVID*" (Lizzie-CLM); "*this year I've sort of decided to open myself up a little bit more about using the LMS…it can help me…want to make my teaching process easier for myself*" (Tina-HMT).

5.3.2 Benefits of using LMS

Findings indicate that lecturers believe the benefits of LMSs relate to (1) study/learning material; (2) ease of use; (3) communication and engagement; (5) integration with other platforms; and (7) assessments.

5.3.2.1 Study/Learning material

Lecturers indicate a major benefit of the LMS is that it enables them to **share learning material with their students**, "*the most important part of the LMS has been that I can put material up for the students to access and that I can show the students the structure of the course*" (Leona-CLM*); "easily share things online and I don't have to struggle printing the course content"* (Santiago-CLM); "*it is a repository of learning resources*" (Dineo-HMT). Types of material include **uploading documents** "*I share material and upload videos of lectures points*" (Brenda-HMT); "*I upload documents*" (Tina-HMT); "*I put all learning material online*" (Leona-CLM), and **podcasts and videos** "*very effective for podcasting*" (Matthew-HMT), "*allows me to have a record to go back to with the students that doesn't rely on printing and word of mouth"* (Brenda-HMT).

5.3.2.2 Ease of use

Findings indicate that **flexibility** of the LMS enables lecturers to be more efficient in essential activities needed to run a course, these include **organisation of content** "*flexibility of being able to organize content in a way that will make it easy to do a refresh on teaching and learning material*" (Tania-CLM), **creation of course sites** "*flexibility to create your sites and take your time, only once you feel what you have is sufficient, you publish*" (Tania-CLM), and **engaging with outside lecturers** "*flexibility to allow external email address for sessional staff to access the system"* (Tania-CLM).

Lecturers also indicate that using the LMS improves **accessibility** "*it's easily accessible*" (Tania-CLM), as lecturers and students can **access content anytime and anywhere** "*so convenient to be*

able to access it anytime and anywhere" (Tania-CLM); "*could have lectures anywhere…if I leave campus late, I have Teams on my phone while calling in traffic*" (Nadia-CLM), **communicate more easily** "*students can reach their lecturers anytime…lecturers can be able to access the content anytime*" (Santiago-CLM); "*can be working on stuff at midnight…post it and students can also do things in daytime*" (Lizzie-CLM). Findings also suggest that using the LMS makes **allocating and managing of student groups easier** "*LMS allows you to conveniently create and allocate student to groups and it creates a separate site for that group so the group gets its own site and so that group themselves can communicate"* (Leona-CLM).

Additionally, lecturers indicate the **new LMS** enables them to perform **tasks more effortlessly**, "*the previous LMS was difficult and pedantic, I think the new LMS is a better shift*"(Matthew-HMT); "*I used to use the LMS before COVID, I think the current LMS is a lot more user-friendly*" (Tina-HMT) as the interface is user friendly *"interface is quite friendly"* (Tania-CLM); "*fairly easy to use*" (Dineo-HMT); "*ease of use is there*" (Santiago-CLM).

5.3.2.3 Communication and Engagement

Lecturers feel that using the LMS enables them to **communicate more efficiently through announcements** "*I am able to just put out announcements to communicate efficiently"* (Tina-HMT); "*I communicate using the LMS by sending formalised announcements*" (Dineo-HMT); "*the announcements are great*" (Brenda-HMT); "*LMS is great at communicating announcements*" (Matthew-HMT); "*don't have to answer to individuals via emails, I can just put out an announcement or a notice…use announcements on my phone on the app for last minute notices*" (Tina-HMT). In addition, lecturers believe the use of the **discussion forum enables engagement and debate outside the classroom**, "*discussion point is very effective*" (Matthew-HMT), "*allows me to engage with the students…*" (Santiago-CLM), **"***if I want students to engage with each other, I can set up discussions*" (Lizzie-CLM).

5.3.2.4 Integration with other systems

According to some of the lecturers, one of the capabilities of the LMS is its ability to **integrate with external systems** that are needed to provide a holistic teaching and learning environment for example the **calendar and cloud storage** "*ability to integrate other systems, such as integrate them to your calendar so that you're able to sync to your e-mail...sharing to OneDrive or Google*

Drive"(Santiago-CLM) and **plagiarism functions** "*being able to see those scores before you do assessments for students is valuable*"(Tania-CLM).

5.3.2.5 Assessments

Some lecturers indicate that the LMS **removes administration and reduces workload** in managing and administering assessments, with **easier initial setup tim**e "*I create assignments and then the students can submit their assignments and I can set the due dates and the due times*" (Leona-CLM); "*assignments are great because I can set them up online and do the grading*" (Brenda-HMT), ability to **individualise submission dates** "*I can actually change submission dates for individual students"* (Leona-CLM), and **online grading** "*the fact that I can put out quizzes which can be automatically marked is incredibly advantageous*" (Leona-CLM); *"provides marking online where a student will get feedback immediately*" (Nadia-CLM).

5.3.3 Challenges of using LMS

Even though lecturers indicate multiple benefits from using the LMS, findings indicate challenges exist in regard to (1) system, (2) functionality, (3) infrastructure, and (4) skills.

5.3.3.1 System limitations

Lecturers report that limitations of the LMS result in **lack of confirmation messages** "*system does not confirm back that whatever action I was doing completed or failed - you just have to go with your gut feels that whatever you're trying to do is now done*" (Tania-CLM); **mistakes from customisation** "*because of the latitude given users to make their own customised configurations, there is too big a room to make mistakes e.g., thinking that something is displaying and to students*" (Tania-CLM), **inability and difficulty in accessing previous work** *"inability to access the files once the student has left the university…previous year's course data cannot be easily navigated to"* (Tina-HMT), inflexible **structures** "*LMS does not accommodate different projects running within a course…the mailer within LMS defaults student email address, it is an issue when a person has multiple email addresses"*(Tina-HMT), **system capacity and stability issues** "*when COVID kicked in, students couldn't be able to interact and have simultaneous sessions with 100+ students, the system would usually crash*" (Santiago-CLM), **consumption of large amounts of data** "*we experienced data use issues because we are media heavy, free allocated data supply that the*

university provides is not sufficient for a lot of students" (Dineo-HMT); and **limitations relating to uploading and exporting data** "*it is very slow when you are uploading certain files, can even cause the machine to hang, and you have to start all over again*"(Tania-CLM); "*inability to load or limitations in relation to loading images and videos*" (Brenda-HMT).

5.3.3.2 Functionality limitations

Respondents report there are **sorting and formatting issues** "*it was difficult to get a printout of a multiple-choice exam in a format that was good to send to the external examiner or to the exam's office*" (Leona-CLM); "*initially could not sort the names of students by surname*"(Leona-CLM); **inflexible functions** "*not enough flexibility involved with exporting marks from the grader to excel and uploading them back*" (Leona-CLM), "*there is no way to exclude students who did not meet minimum pre-requisite requirements from taking quiz assessments*" (Santiago-CLM), **useless tools** "*video conferencing tool, the blue button tool, was absolutely useless, was absolutely unreliable*" (Dineo-HMT).

5.3.3.3 Infrastructure limitations

Findings indicate that **availability of power** "*load shedding, unreliable internet connection and power*"(Nadia-CLM); "*working around loadshedding*"(Dineo-HMT); "*I think it's about load shedding*"(Matthew-HMT), **network connection speed** "*during the pandemic, sometimes students would not have enough coverage in their homes to be able to effectively participate in live theatre sessions*" (Matthew-HMT); **access to a machine with good hardware specifications** "*need for a computer that has good not only good internet speed but also good specs such as processor, graphics card and RAM*" (Santiago-CLM), all influence the ability to effectively utilise the LMS.

5.3.3.4 Lack of Skills

One lecturer feels that the **excess of features** contributes to her lack of skills in using the full set of functions in the LMS "*the LMS has too many options, I tend to stick to features that I am familiar with*" (Nadia-CLM), others believe that its **training** "*I don't use the rest of the features because I did not receive training*"(Tina-HMT); "*I think it's about training*"(Matthew-HMT), "*proper training will motivate me to use all the features because you would have somebody that's knowledgeable or an expert in it that will go through with you to make you understand"* (Nadia-

CLM)*; "refresher training from time to time…make us aware of a whole range of other functionalities*" (Tania-CLM); *"training session with our department lecturers…introduces us to a few other tool sets that could be useful*" (Dineo-HMT), **online tutorials** *"quick, easy tutorials that we could watch that maybe deal with different aspects or little tutorials that are available* on *YouTube or online or whatever that we can just watch as opposed to a course*" (Brenda-HMT), and **on the job training** *"I think it would just be useful for somebody to show us how they use it"* (Tina-HMT)*;* "*training would help*" (Lizzie-CLM) was provided their skills and extent of use would improve, as currently most of what they know is self-taught "*majority of the things in the LMS we basically learned how to use it ourselves*"(Nadia-CLM).

5.3.4 Lecturers' attitudes

Despite the various issues that lecturers experience using the LMS, a number of lecturers display **willingness and more determination to use the LMS**, "*I don't feel unwilling to use it at all, totally depend on it, cannot manage without it, it's basically the central control point of all our courses*" (Leona-CLM); "*there hasn't been any of the episodes to say I shouldn't use them, instead COVID made me use LMS even more*" (Santiago-CLM); "*never been unwilling, the more it makes my life easier I get enthusiastic to use it…COVID made me use it more than I used it before*" (Lizzie-CLM); "*not unwilling, I think I may be unwilling where it just requires too much, where it's not user friendly and it takes me a long time to figure out certain tool's settings*" (Dineo-HMT) and are more **motivated** with **increased curiosity** to use the LMS "*I am highly motivated to see what I can do with it, how I can make my courses interesting on it*"(Nadia-CLM); "*I think motivated, in fact, sometimes it makes you want to find out more…*"(Lizzie-CLM); "*I would say they've mainly motivated me…*"(Santiago-CLM); "*definitely been an upward trend towards motivating*" Tina-HMT); "*they have motivated me… I can't imagine not using the system*" (Leona-CLM); "*they motivated me"* (Matthew-HMT), despite issues "*I don't think I'm demotivated to use the system; the system works…you still want to carry on using it despite the issues"* (Brenda-HMT).

On the other hand, Dineo acknowledges usefulness of the tool but indicates she is not highly enthusiastic because of the nature of her courses "*I'm not super enthusiastic about it, it's just a useful tool… my courses are not primarily theory driven or primarily online*" (Dineo-HMT), some lecturers attitude is neutral as **LMS use is mandatory,** "*I have no choice to not use the system… I have to use it whether it is working to my satisfaction or not…I just have to get around whatever*

hurdle I may encounter and use it…emotions don't come to play" (Tania-CLM); "*it hasn't been a major revelation or anything like that… it's not something I feel completely passionate about…it's not like I'm super enthusiastic or demotivated*" (Dineo-HMT), and others report that their unwillingness results from the challenges they experience in regard to **infrastructure limitations** *"constant power failure* (Nadia-CLM); **system limitations** *"I think the space limit is a big issue for me"* (Brenda-HMT); "*not being able to reply to a chat notification directly from an email and sound issues during live sessions"* (Nadia-CLM), and **time constraints** "*the time to learn and time to do"* (Tina-HMT).

Table 2: Summary of WILL findings

	Benefits	**Challenges**	**Attitude**
Dineo-HMT	• Repository to share learning material • Easy to use	• Consumes lots of data • Loadshedding • Self-taught • Training	• Willing to use LMS if user friendly, not too much effort or time to use or learn • Not enthusiastic about LMS
Nadia-CLM	• Convenience to access it anywhere • Online grading and immediate feedback	• Load shedding, unreliable internet connection and power • excess of features • Training	• Highly motivated to discover what can be done to make courses more interesting • Unwillingness is caused by constant power failure and system limitations
Santiago-CLM	• Share course content • Easy communication with students' accessibility of content • Ease of use • engagement with students • integration with email external systems, Google drive and One drive	• System capacity and stability issues • Inflexibility to exclude students within a group from taking assessments • Access to a machine with good hardware specifications	• Motivated and more determined to use it
Tania-CLM	• Easy accessibility • Convenience to access it anywhere anytime • Flexibility to organise learning material, course sites and allows access to external lecturers • Efficient communication through announcements	• Lack of confirmation messages when performing LMS operation • Prone to mistakes due to customisation flexibility • Limitations with uploading and exporting data • Training	• Motivated to use it but does not feel enthusiastic nor demotivated due to feeling obligated with no choice to not use it

	• Integration for plagiarism checks		
Matthew-HMT	• Podcasting • Efficient communication through announcements • Enables discussion outside the classroom	• Useless and unreliable video conferencing function • Network coverage • Training	• Motivated
Leona-CLM	• Share course material • Uploading learning material • Convenient creation and management of groups • Easy setup and administration of assignments • individualize assignment submission dates • Setup quizzes and grade online	• Formatting issues with multiple choice exams • Inflexibility with exporting and uploading marks	• More motivated, dependent and cannot manage without it
Tina-HMT	• User friendly • Efficient communication through announcements	• Inability to access previous year's data • Inability to accommodate different course structures • Training	• Unwillingness is influenced by the time it takes to learn and do
Lizzie-CLM	• Convenience to post course resources at any anytime • Engagement with students through discussions	• Training	• Enthusiastic and motivated with increased curiosity to discover more •
Brenda-HMT	• Sharing of course material and uploading of videos • Provides a backup to always reference back to. • Efficient communication through announcements • Setup assignments and grade online	• Limitations with uploading data • Online tutorials	• Motivated/ still want to carry on using it • Unwillingness to use is influenced by limited storage space

5.4 Skill

In order to understand lecturers' skills and experience using LMS (Knezek & Christensen, 2016), a question relating to their competency and skills level was asked, (6) *Please describe a situation where you felt satisfied with an LMS operation in relation to your skill; (7) Please describe what your skill level is in regard to using the LMS.*

5.4.1 Lecturers' LMS competencies

Lecturers indicate different skills that enable (1) effective management of courses "*I needed to setup students in different groups, so I needed to separate the students and know which ones belong in which category so that I could calculate the pass rate and the fact that the LMS gave me the ability to do that, that was a bonus for me*" (Santiago-CLM); "*I could transfer course material from one year to the next, which was quite cool"*(Brenda-HMT); *"setting up pages to give the ability to package different things to make them all fit together in a way that makes sense was quite satisfying… so students don't have to go look for different things in different places*"(Lizzie-CLM)*;"setting up assignments"* (Brenda-HMT); "*I use very basic stuff like the pages, written assignments and grading of written assignments .. uploading of files … those all work*" (Dineo-HMT); "*I did want to upload marks from a spreadsheet onto the LMS*" (Leona-CLM), (2) efficient communication *"setting up announcements …that was nice"*(Brenda-HMT); *"setting up the LMS app on my phone where I can send announcements"* (Tina-HMT), (3) live meetings "*created the town hall on the LMS as a kind of calendarized modus…having a live town hall on it was very exciting and very engaging*"(Matthew-HMT*),* and (4) general administration "*we had to create a profile of ourselves…creating tabs and links to make it a bit user friendly where students get to know a bit more about your background…found that was very exciting to use…enjoyed it…was satisfied with creating that*" (Nadia-CLM).

5.4.2 Skills level analysis

Findings indicate all **lecturers within CLM seem to be comfortable with their use of LMS** and have advanced skills, "*I would peacefully say it's advanced*" (Santiago-CLM); "*maybe very good, I'm very comfortable" (Lizzie-CLM); "you can leave it at very good*" (Tania-CLM); "*I can do it, if I don't know how to do it, I'll work it out… I'll probably be very good"* (Leona-CLM); "*from one to ten, I would say 8 is kind of like fair because I said I wouldn't know all the features otherwise I'm confident with it*" (Nadia-CLM). However, in HMT findings indicate LMS skills are more varied with Dineo reporting she has basic skills "*probably pretty basic*" (Dineo-HMT), Tina reporting low skills "*it is low"* (Tina-HMT) and Matthew and Brenda reporting they possess good skills "*I think I'm good*" (Brenda-HMT); "*I am fairly okay with what I use, I'd say good, but of course I don't use everything*" (Matthew-HMT).

Table 3: Summary of SKILL findings

	Skill	**Skill level**
Brenda-HMT	**Course Management:** • Transfer of course material between different academic years • Setting up assignments **Efficient communication:** • Setting up announcements	Good skills – can navigate the LMS to perform more than average tasks
Dineo-HMT	**Course Management:** • Setting up pages, announcements, written assignments, and grading of written assignments, uploading of files	Basic – can perform basic LMS tasks
Matthew-HMT	**Efficient communication:** • setting up a live a meeting event	Good - can navigate the LMS to perform more than average tasks
Tina-HMT	**Efficient communication:** • setting up announcements via mobile LMS	Low – takes an effort to perform basic tasks
Nadia-CLM	**General administration** • setting up profile page with different tabs and links	Advanced – can perform advanced tasks and can resolve issues without assistance
Leona-CLM	**Course management** • uploading marks from a spreadsheet into LMS	Advanced – can perform advanced tasks and can resolve issues without assistance
Tania-CLM	**Course Management:** • setting up course sites for multiple modules	Advanced – can perform advanced tasks and can resolve issues without assistance
Santiago-CLM	**Course Management:** • Setting up students in different groups to calculate the pass rate	Advanced – can perform advanced tasks and can resolve issues without assistance
Lizzie-CLM	**Course Management:** • Packaging course material under Pages	Advanced – can perform advanced tasks and can resolve issues without assistance

5.5 Tool

In order to understand availability of features that lecturers' need for their subject areas (Knezek & Christensen, 2016), questions relating to awareness of different features, most used features and reasons for use and non-use, accessibility of the LMS and support available were asked, (8) *What features are available on the LMS; (9) What are the primary LMS features you use; (10) Please explain what benefit you derive from using these features; (11) What other LMS features exist, but are not used by you; (12) Please explain why you do not use certain LMS features; (13) What would be helpful to motivate use of all the LMS features; (14)* Please describe a situation where you felt frustrated with completing an LMS operation; (15) *Please describe the LMS support available; (16) and Please describe your access to the LMS and the associated features.*

5.5.1 Lecturers' awareness of LMS Features

Findings indicate that lecturers are aware of a variety of available LMS features for administration and course management (1) **communication features** "*announcement is one on whichever platform, chat*" (Nadia-CLM); "*announcement, emails and chat*" (Tania-HMT); "*announcements*" (Dineo-HMT); "*announcements*" (Brenda-HMT); "*announcements*" (Tina-HMT); "*announcements*" (Leona-CLM); "*announcements*" (Matthew-HMT); "*chat, discussions*" (Lizzie-CLM); "*discussion and group chats*" (Santiago-CLM), (2) **knowledge testing features** "*grading assignments*" (Nadia-CLM); "*grading or grades, assignment, quizzes*" (Santiago-CLM); "*students' assessments and even assess online*" (Tania-CLM); "*grading, assignments*" (Dineo-HMT); "*assignments, grading*" (Brenda-HMT); "*assignments, course grade*" (Tina-HMT); "*assignments, quizzes, grades, rubrics*" (Leona-HMT); "*grading, rubrics*" (Matthew-HMT); "*quizzes, assignments*" (Lizzie-CLM), (3) **course content and management features** "*modules*" (Nadia-CLM); "*modules where you can post your calls content*" (Santiago-CLM); "*course site, history*" (Tania-CLM); "*pages*" (Brenda-HMT); "*media*" (Tina-HMT); "*modules, pages, people*" (Leona-CLM); "*pages, modules, syllabus*" (Matthew-HMT); "*modules and pages*" (Lizzie-CLM), (4) **Integrated platforms** "*OneDrive or Google Drive, sync integrating things to your e-mail*" (Santiago-CLM); "*dropbox*" (Brenda-HMT), and (5) **collaboration features** "*people, collaborations in syllabus and badges, big blue button*" (Leona-CLM); "*people or groups*" (Nadia-CLM); "*people*" (Leona-CLM); "*big blue button, syllabus*" (Mathew-HMT); "*groups section*" (Lizzie-CLM). Figure 5.1 shows a diagrammatic representation of LMS features that lecturers are aware of.

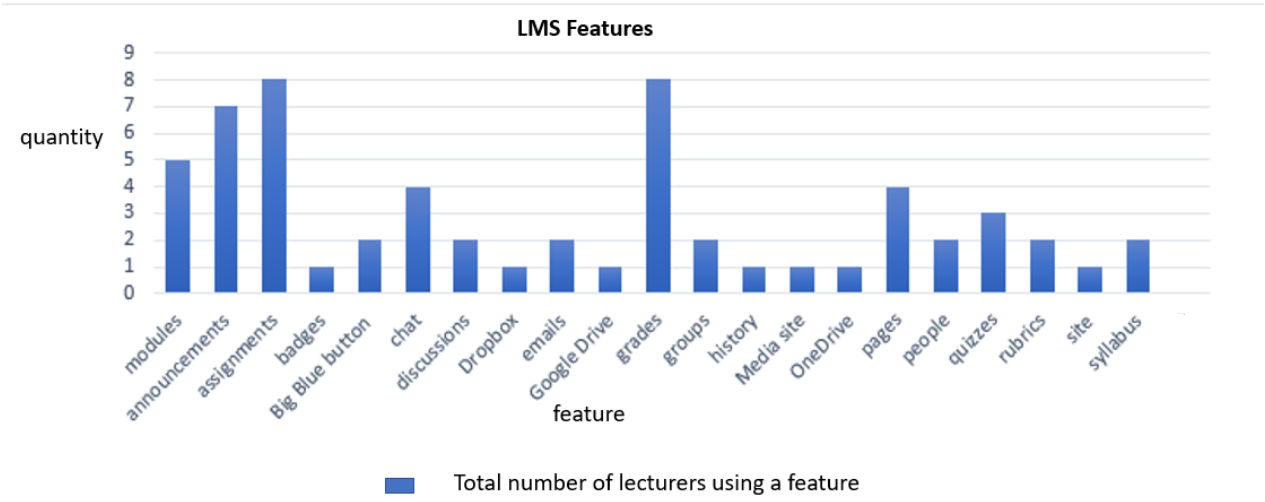


Figure 4.1: LMS Features

5.5.2 Lecturers' use of LMS features

Even though lecturers appear to be aware of a variety of features, lecturers primarily report that they use **announcements, assignments, modules, chat, discussion, grades, course content management, pages, people, class list, attendance, syllabus,** and **quizzes**. For instance, Nadia reports to use "*announcements*", "*assignment*", "*modules, "people*", "*the grouping aspects*", "*the grading*" (Nadia-CLM); Santiago uses "*modules*", "*discussion*", "*chat*", "*grades*", "*people*" (Santiago-CLM); Tania reports to be using "*I upload course outlines*", "*assessments*", "*I make announcements*", "*I chat to students regarding their performance*" (Tania-CLM); Dineo uses "*announcements*", "*uploading files*", "*assignments*" (Dineo-HMT); Brenda uses "*announcements*", "*assignments*", "*pages*" (Brenda-CLM); Tina uses "*announcements*", "*class list*", "*uploading YouTube things for students"*, "*assignments*", "*pages*", "*syllabus*" (Tina-HMT); Leona uses "*I use announcements*", "*I use modules*", "*I use assignments*", "*I use discussions*", "*I use quizzes*", "*I use grades*", "*there's the people a thing which lets you create your groups which I use, and you can create pages*" (Leona-CLM); Matthew uses "*discussions*", "*pages*", "*announcements*", "*data analytics/attendance*" (Matthew-HMT) and Lizzie uses "*chat*", "*discussions*", "*quizzes*", "*assignments*", "*modules*", "*pages*" (Lizzie-CLM).

Some features are reportedly under-used, for instance findings indicate that only Nadia uses groups "*I use the grouping aspects*" (Nadia-CLM), while Tina is the only lecturer using syllabus "*syllabus*"

(Tina-HMT) and Matthew is the only lecturer using attendance "*data analytics/attendance*" (Matthew-HMT). Additionally, two CLM lecturers appear to use people, "*I think to a certain extent there is a feature called people*" (Santiago-CLM); "*there's the people, a thing which lets you create your groups*" Leona-CLM), and chat "*the primary features I use will be your chat*" (Santiago-CLM); "*I chat to students*" (Tania-CLM). While only three lecturers mostly use grades "*your grades*" (Santiago-CLM); "*the grading*" (Nadia-CLM); "*I use grades*" (Leona-CLM), modules "*the primary features I use, it will be your module*" (Santiago-CLM); "*modules*" (Lizzie-CLM); "*it will be your module*" (Nadia-CLM), quizzes "*quizzes*" (Lizzie-CLM); "*I use quizzes*" (Leona-CLM); "*I also do assessment of students online*" (Tania-CLM), and data uploads "*I upload course content*" (Tania-CLM); "*uploading files*" (Dineo-HMT); "*uploading YouTube things for students*" (Tina-HMT). Table 4 shows a summary of lecturers' use of LMS features, the table shows that CLM lecturers are quite diverse in their use and appear dominant than HMT lecturers.

Table 4: Lecturers' summary of feature use

Primary feature used	**Lecturers**
Announcements	**CLM Lecturers:** Nadia, Tania, Leona **HMT Lecturers:** Dineo, Brenda, Tina, Matthew
Assignments	**CLM Lecturers:** Leona, Lizzie **HMT Lecturers:** Dineo, Brenda, Tina
Chat	**CLM Lecturers:** Tania, Lizzie
Discussions	**CLM Lecturers:** Leona, Lizzie, Santiago **HMT Lecturers:** Matthew
Pages	**CLM Lecturers:** Tina, Leona, Lizzie **HMT Lecturers:** Brenda, Matthew
People	**CLM Lecturers:** Santiago, Nadia
Grades	**CLM Lecturers:** Santiago, Nadia, Leona
Modules	**CLM Lecturers:** Santiago, Nadia, Leona
Quizzes	**CLM Lecturers:** Tania, Lizzie, Leona

Course data upload	**CLM Lecturers:** Lizzie **HMT Lecturers:** Dineo, Tina
Attendance	**HMT Lecturers:** Matthew
Groups	**CLM Lecturers:** Nadia
Syllabus	**HMT Lecturers:** Tina

5.5.3 Lecturers' Perception of LMS support

Findings indicate that most lecturers feel that university has **sufficient support in place** to assist them and majority are satisfied with support received "*they've got a separate number for the learning management system*" (Leona-CLM); "*we have support directly in the faculty but then there's also support through the teaching and Learning Center*" (Lizzie-CLM); "*when I had an issue, the support I got was really great, it was very good, the university does provide adequate support for the LMS…it was resolved immediately*" (Nadia-CLM); "*hasn't been any situation that the CLTD hasn't been able to address*" (Santiago-CLM); "*they're very good, very efficient, I never struggle*" (Tania-CLM); "*I normally will phone them, and I would get all the assistance I need*" (Dineo-HMT); "*I haven't tried in a while, but when I did try last year, people were very responsive, I did contact…people were helpful*" (Tina-HMT) with the exception of Matthew who appears to be dissatisfied with support received "*I would say support is mediocre, it's not responsive enough, it's not engaged enough, I think we need a complete technical intervention in the university*" (Matthew-HMT).

5.5.4 Used and under-used LMS Features

Reasons given by lecturers for the recurrent use of LMS features include: (1) **convenience** "*I use announcements, modules, assignments, discussions, quizzes, grades, people to create your groups, and create pages…benefit for me is convenience, all these functions are performing functions that I wouldn't necessarily want to be doing myself especially with very big classes"(Leona-CLM),* (2) **keeping students informed and engaged** *"discussions and announcements are very effective for engaging the students and keeping them informed about the course content and whatever developments there maybe regarding the material"* (Matthew-HMT)*, "discussions where one can post a question or student can post a question and a whole lot of people can answer"* (Lizzie-CLM), (3) facilitation of **real time communication** *"the chat function allows me to chat in real time with students"* (Lizzie-CLM), (4) **assessment of student knowledge** *"I also use the quizzes a lot to test*

student's understanding on the content especially during online classes when I cannot read their faces" (Lizzie-CLM); *"the grading part of it for submissions* (Nadia-CLM); *"grades assist me to organize my work according to the course outline"(Santiago-CLM),* (5) **easy organisation of work** *"it makes it a bit easier where everything is in one place" (Nadia-CLM), and* (6) **easy sharing of content** "*the benefit is being able to share the content easily"* (Nadia-CLM) and manage assignments "*I cannot only set the assignment, but I can also set when it should be available, when it should be stopped like for example blocking students access to either upload or to access the content…can limit the type of files they can submit, for example, I can say…PowerPoints or PDF's or web file"* (Santiago-CLM).

In regard to under-used features, lecturers provide various reasons they do not use these features, these include features that are **inaccessible or unnecessary** "*I find the e-mail to be duplicated and not immediate to access unless you log back into the system*" (Nadia-CLM), **current LMS features being used are sufficient** *"I don't use chat, outcomes, rubrics, big blue button, collaborations in syllabus and badges…I haven't needed them…my course is going quite well without them"*(Leona-CLM); "*I don't use syllabus, big blue button, media site videos …not really needing them in my teaching*" (Matthew-HMT), and **non-alignment to the nature and requirements of their courses** "*haven't used the grade book because I have to be in class with students to work"*(Dineo-HMT); *"a lot of what I teach is technical, so rubrics are not appropriate"* (Leona-CLM); "*collaboration where students could easily engage with other students like do any work as a team or group work, but because we haven't engaged with the group activities…I haven't used it*" (Santiago-CLM); "*recording of lectures…course evaluation, I'm aware that it may be something that other people use, but I don't*" (Tania-CLM). Furthermore, some lecturers indicate that they do not use other features as they **do not have enough time to learn how to use them** "*takes time to learn new stuff and incorporate them*" (Leona-CLM); "*our programs are practical…I need to be more in contact with students than spending time figuring out how things work*" (Dineo-HMT), **need training to know what other feature**s are and **how they work** "*I haven't used most of these features because I don't know how they work*" (Brenda-HMT), "*I don't use the rest of the feature because I did not receive training*" (Tina-HMT), "*not aware of other features*" (Matthew-HMT), and thus are **using other preferred alternative programs** "*recording of lecture, course evaluation… I don't need to use some of these features because there are other apps that are similar that I can use to achieve the same objective*" (Tania-CLM); "*I don't use messaging, we always use WhatsApp as a more*

instant communication channel with students" (Dineo-HMT); "*uploading course material and documents…Google Drive is better for some of my material*"(Brenda-HMT); "*big blue button…we use MS Teams*" (Leona-HMT).

5.5.5 Challenges of LMS Features

Lecturers identify specific instances where they felt particularly frustrated completing LMS operations, for example, **creating courses is time consuming** "*just before the semester starts, courses have to be created and you have to upload documents and create a welcome page and put content …that was a bit time consuming*"(Nadia-CLM**), excluding students from taking assessments is not possible** *"the lack of ability to block some students from completing an exam*"(Santiago-CLM*),* **limited storage space** *"became harder to add material due to space…in that way I had to switch to Google Drive"*(Brenda-HMT), **formatting issues** *"it was very difficult to print a nice-looking version of a multiple-choice quiz*"(Leona-CLM), and system inflexibility *"we've got a course code for a semester…in a semester we teach two different assignments…the first lecturer that opens the course code sets the proxy... puts the image, project and my notices… in semester two, another lecturer come in teaches something else…problem is, the front page and the interface still remains the first project that was set up, even though the project has now changed"*(Tina-HMT); "*if you had a list of people in the course, previously you could arrange by the date that they last accessed, but in current LMS you can't do that*"(Lizzie-CLM), *"because we split the groups for COVID purposes, LMS doesn't have the option on the register for taking register one group of students who are coming on different days*"(Tina-HMT). Furthermore, lecturers indicate frustrations around **downloading class lists** "*this new LMS has a slightly different way in which you go about downloading class list"* (Tania-CLM); "*not being able to download the class list in an easy format*" (Tina-HMT), **class list not corresponding with the list obtained from the admin office** "*the class list we get from our school administrative manager and the class list on LMS are often not necessarily aligned and that has quite serious implications for students*" (Dineo-HMT).

5.5.6 LMS availability

Findings indicate that despite planned maintenance and power outages that affect system availability, in general, accessing the LMS is not an issue "*very easily you can access the features after you have logged on, there's no issue with that*" (Nadia-CLM); "*access to the system is through*

normal internet access, I haven't had any issues with that…no situation where the LMS was not available" (Santiago-CLM); "*whenever I need to access the LMS, it is available, if there is maintenance, they normally communicate in advance*" (Tania-CLM); "*I haven't had any issues, every time I need to use LMS it is available*" (Tina-HMT); "*maybe one or two incidents right early on where I couldn't access the system, but in general, it hasn't been a problem at all*" (Leona-CLM); "*access to LMS is pretty much straight forward, no issues, always available when I need it besides the load sharing*" (Matthew-HMT); "*I've actually found it very stable, I would say better than our previous LMS*" (Lizzie-CLM). However, Brenda (HMT) reports there has been issues in accessing some of the features, "*when I go open my media site videos…I get an error that automatic catalog provisions are not supported*".

5.6 Pedagogy

In order to understand lecturers' style of teaching and their belief system in regard to integrating technology into the classroom (Knezek & Christensen, 2016), questions relating to teaching styles and LMS beliefs were asked: (*17) Please detail your lecturing experience, (18) What subjects do you teach?; (19) How would you describe your teaching style; (20) Please explain your beliefs about integrating technology into teaching;* and *(21) Please explain whether you believe LMSs align with your teaching style?*

5.6.1 Lecturers Teaching Styles

Findings suggest that some lecturers feel that a teaching style **cannot be generalised** and is influenced by **size** "*I think it's very difficult to give a particular answer…because lecturing a class of 300 in first year is very different from the group that I would have in honours, which is about 30 students…have to adapt your style because of just the size of the class"* (Lizzie-CLM)- and **level of the class** "*I use different styles depending on…the level of the course that I'm teaching*" (Tania-CLM) and the **content being taught** *"it's not a one size fits all for everybody, one does have to adapt depending on the content that I'm doing"* (Lizzie-CLM); "*the lecturing is very practice oriented and studio driven… formal seminars, presentations and lectures are interactive and there's always discussions connected to it"* (Dineo-HMT); "*it's definitely more interactive for some teaching, and the most part is me being hands on with the students and giving one-on-one feedback or feedback in small groups"* (Tina-HMT); "*I normally combine various teaching methods to be able to impart the content to the students, it depends on the topic*" (Tania-CLM).

Most of the lecturers describe their teaching preference as interactive and discussion-oriented *"it's definitely more interactive for the majority of the teaching" (Tina-HMT); "very interactive, but in history of art there's also times when I really lecture"* (Brenda-HMT)*; "I try my best to make the lectures as interactive as possible. I don't believe that you can really engage students unless they are interacting with you"* (Leona-CLM); "*one of the things I like for my lectures is engagement with students…I like us to be having more of a conversation and that goes with whatever I'm lecturing*" (Lizzie-CLM); "*we go through exercises and application, so that's basically where the student interaction is coming in"* (Nadia-CLM).

5.6.2 Role of Technology in Teaching

Most lecturers appear to believe that **technology is essential in education** "*it's a must...whether you accept it or not, it's still there, you have to embrace or adopt it..."* (Nadia-CLM); *"it is really important…its part of a creative thinking and learning process*" (Dineo-HMT); "*it's absolutely invaluable*" (Brenda-HMT), "*technology is a very important part of our teaching…an enabler to make my teaching better…I have to partner with technology in many of my teachings and courses to make sure I deliver the content that is relevant and exciting for student*" (Tania-CLM); "*it's certainly essential*" (Leona-CLM), some caution that technology should **not be overly relied on but rather be seen as a supporting role**, "*one should be able to more cleverly incorporate technology and use technology in whatever course you deliver...I don't believe that it's an all or nothing"* (Lizzie-CLM); *"it shouldn't sacrifice the interactivity and engagement with the students…should rather be used to improve the engagements of students*" (Leona-CLM).

5.6.3 LMS and Lecturers' Teaching Styles

Findings indicate that **CLM lecturers** believe that the **LMS benefits their teaching** as it **aligns to teaching styles** "*the LMS platform is aligned to the teaching style that I've been delivering in the various institutions*" (Nadia-CLM), **allows for sharing of material** "*LMS allows for online learning, sharing of things like for example videos*" (Santiago-CLM); "*I would like to obviously have a platform that allows me to share the course material with the students… and it's got that ability to do that*" (Tania-CLM), **caters for different ways of engagement** "*live sessions, discussions and allows time to engage and interact with the students from a distance*" (Santiago-CLM); "*learning management systems do align with my teaching style because they allow for different ways of engagement*" (Lizzie-CLM).

However, disparate views appear evident with **Humanities** lecturers. Some lecturers believe the **LMS benefits their teaching** "*but I use it for announcements, it is the kind of repository of resources for readings…I use it for written assignment…I think it works well with that*" (Dineo-HMT); "*LMS is a great tool and a very important tool, there's a lot of advantages in terms of archiving repositories, communicating announcements, auditing attendance*" (Mathew-HMT), others report that the **LMS does not align to current teaching methods**, "*it does not and cannot align with the teaching styles that we have in our program simply because we are a practice driven program"* (Dineo-HMT) and thus the **LMS need to improve for alignment to be established** "*I think it can be, with some improvements, I think it's getting there, there can definitely be some improvements around the format of how we can load and share material*" (Brenda-HMT) and **current teaching methods need shift** to incorporate LMS use "*it does align but it is an adjustment, I have been in education for a while, I am more set in the old ways*" (Tina-HMT).

5.7 Conclusion

This section presented the findings for the case study site. It began by first giving a description of the site, followed by the description of lecturers interviewed followed by a demographic table. Next, findings in relation to the theoretical framework components i.e., Will, Skill, Tool, Pedagogy were presented. On Will, key findings that emerged were lecturers' beliefs of LMSs, benefits and challenge of using LMS, and lecturers' attitudes towards LMSs while on Skill, findings included different lecturers' LMS competencies and skills level. On Tool, findings included lecturers' awareness of LMS features, lecturers' use of LMS features, lecturers' perception of LMS support, frequently used and under-used LMS features and LMS availability, while findings from Pedagogy included lecturers' teaching styles, the role of technology in teaching and LMS alignment with lecturers' teaching styles.

6. DISCUSSION

This research pursued two objectives, first to understand lecturers' perceptions, experience, and extent of use of LMS during and post Covid-19 and secondly, to explore the underlying reasons lecturers find certain LMS features beneficial and others less valuable. In order to achieve these objectives, the Will, Skill, Tool, Pedagogy (WSTP) framework was used to explore how lecturers' attitudes, competency, access to the LMS and teaching style influence their subsequent use or non-use of LMSs (Christensen & Knezek, 2001). As the study aimed to understand more about lecturers' use of LMS in higher educational institutions, WSTP was seen as a valuable model because it was specifically developed to explain technology integration within teachers and it offers a multi-dimensional approach in explaining technology integration in teaching (Sasota et al., 2021). A qualitative approach was selected for the study and semi-structured interviews were used as a means of data collection.

6.1 Will

WILL describes lecturers' attitudes and beliefs towards the use of technology for instructional purposes (Knezek and Christensen, 2016). The key findings include lecturers' beliefs of LMSs, the perceived benefits and challenges, and lecturers' attitudes towards LMSs.

6.1.1 Beliefs

Prior to the pandemic, findings indicate that LMSs were already being used by lecturers, with many reporting that **LMSs were positively contributing to their teaching.** This finding concurs with Aldiab et al. (2019), Letseka et al. (2018), Papadakis et al. (2018) who found that prior to COVID-19 institutions had already begun to implement LMSs to manage the educational content delivery and expand the teaching and learning experience. Despite the positive beliefs around LMSs, findings also suggest that some lecturers believe current LMSs can be improved as they can be **inflexible** and at times offer **limited functionality**, resulting in **LMSs being underutilised**. This finding confirms Washington (2019) and Hussein et al. (2021) findings that many LMS implementations are underutilised, as lecturers find the interface and design of LMS can be inflexible.

While limitations may account for underutilisation, it is also possible that prior to the pandemic **contact institutions did not utilise LMSs extensively** for core teaching and learning activities

(Alghamdi & Bayaga, 2016) but rather to supplement and complement face-to-face teaching (Misiejuk, Ness, Gray & Wasson, 2023). Findings concur that as the university is primarily a contact institution, face-to-face classes were the preferred mode of teaching prior to the pandemic. During the pandemic, even though the immediate need to switch to an online only approach was challenging for many lecturers (Misiejuk et al., 2023), findings indicate that lecturers began to **appreciate and rely more on the LMS**, which resulted in increased **curiosity and exploration of different functions and capabilities of the LMS** by some lecturers. This finding aligns with Misiejuk et al. (2023) who found that most academic staff increased their use of LMS features during the pandemic. However, post COVID-19, the use of LMS seems to be varied, with some lecturers not using as many of the LMS' functions as during the pandemic, while others are using the LMS more. Findings suggest that lecturers teaching **more business and technology type subjects**, like in CLM, had been **using LMSs even prior to the pandemic and** post the pandemic some of these lecturers' report to be **using the LMS even more extensively** while the HMT lecturers who did not use much of the LMS before pandemic are now **reverting back to limited use.** This finding concurs with Lavidas et al. (2022), Dlalisa and Govender (2020), Modise and Molotsi (2022) that a possible reason for this disparity may be lecturers with proficient technology skills are less intimidated by LMS and tend to use it more while those who are not tech savvy tend to waste a lot of time figuring out how features work to a point of losing interest.

6.1.2 Benefits

Findings indicate that lecturers believe multiple benefits are accrued by using the LMS. Firstly, lecturers report that the LMS's **ability to share learning material** enables them to upload all learning resources applicable for the course without needing to do paper print outs. This finding concurs with Coleman and Mtshazi (2017) who found that LMS took away the need to do print outs and lecturers needing to physically carry them to class for student distribution which seemed to be of great frustration to those lecturers with large quantity of students. Secondly, lecturers believe that the LMS provides them with **flexible ways to organise course content** and sites so that students have a comprehensive view of what the course entails. This concurs with Kehrwald and Parker (2019) who state that LMS make teaching flexible by allowing capability to upload learning material. Thirdly, findings indicate that LMS provides convenience to remotely manage execution of the course, offering access to the **content anytime and anywhere.** This finding is consistent

with Ghilay (2019), Prasojo et al., (2020) who found that LMS enabled lecturers and students unrestricted access to learning content irrespective of their physical location, eliminating time barriers by enabling 24/7 access to course content. Fourthly, some lecturers indicate that LMS enables them to perform **LMS operations much more effortlessly.** This finding is in line with the literature that states an easy-to-use LMS enables lecturers to use any function and lecturers are able to easily familiarise themselves through self-teaching (Coleman & Mtshazi, 2017). Fifthly, findings indicate that lecturers feel that the LMS affords them ways to **communicate and engage with students with features such as announcements and discussions efficiently and continuously**. Existing literature concurs, with Alzahrani (2019), Sackstein, Coleman and Ndobe, (2019) who claim that the communication tools in LMSs promote flexibility, creativity, collaboration, communication, and interaction, even outside the classroom to enhance student and lecture interactions. Sixthly, some lecturers report that LMS integration with external systems such as **calendar, cloud storage, and Turnitin** is advantageous. This finding concurs with Khoza (2015) who found that Turnitin was helpful for teachers as they regarded it to be a means of rescue against plagiarising from database recorded information. Similarly, a study by Napitupulu, Walanda, Poba and Pulukadang (2020) found that integration of the LMS with Google Drive made it easy to share files between students and lecturers. Seventhly, findings indicate that LMS enables lecturers to **easily setup assessments** and **removes the administration and workload** associated with managing and administering these activities. This concurs with Dlalisa and Govender (2020) who argue that LMSs have simplified the assessment processes, reduced lecturers' workload whilst enabling more timely responses and assessment feedback. Lastly, some lecturers indicate **online grading** within the LMS is beneficial as it enables marking online and instant feedback. This finding is in keeping with Ukpai (2021) who states that LMSs enable lecturers to easily disseminate individual student results and feedback to support the assessment process.

6.1.3 Challenges

According to Ngandu (2015) for LMSs to be effectively used there has to be readiness in regard to infrastructure, skill, and time. In this study, findings indicate several challenges relating to system, functionality, infrastructure, and lecturers' skills are hindering lecturers' use of the LMS.

In regard to **system capabilities**, findings indicate that the LMS' **inability to display confirmation messages** upon completion of an LMS operation, **inflexibility to accommodate different course structures**, lecturers' **difficulties in accessing previous work**, **data limitations for uploading and exporting content**, and **large data requirements for students**, are hindering use. This finding is consistent with Alsubaie, Alzarah and Alhemly (2022) who found that when lecturers find tasks challenging, use is limited. So too, in agreement with Mlitwa and Ogundaini (2022) who claim that when too much data is required to use the system, students are unable to access course materials on the LMS.

In regard to **LMS functionality**, some lecturers indicate **inflexible functions of the LMS** cause frustration and result in less efficient and extensive use of the LMS. This finding concurs with Snoussi (2019), Herbert, Demskoi and Cullis (2019) who found that LMS's inflexibility in assessments hinder subsequent use. Additionally, findings indicate that some lecturers feel **certain LMS functions**, like BigBlueButton web conferencing **are useless**. This finding is similar with Belenko, Serebrovsky, Nemtsev and Klepikova (2021) who found that the BigBlueButton's web conferencing service did not work optimally when there was a high volume of students joining the virtual sessions.

In regard to **infrastructure capabilities**, some lecturers indicate frustration regarding **availability of the LMS** due to power issues and **network connection speed**. This finding is consistent with Rana, Garbuja and Rai (2021) who found that load shedding in South Africa obstructs the availability of LMS and slow internet connections impede remote and hybrid learning initiatives (Mtebe & Raphael, 2018). Finally, some lecturers indicate that **lack of skills** blocks them from fully using the LMS. Various studies concur that lack of skills contributes to poor use of the LMS (Modise & Molotsi; 2022; Dlalisa & Govender, 2020; Mpungose, 2020a) lecturers' competencies and skills are a critical component for the success of online teaching (Kim & Thayne, 2015). Furthermore, findings suggest that an excessive number of functions on the LMS, deters use. This finding concurs with Kumar, Bervell and Osman (2020) who found that lecturers were demotivated by the excess of options to choose from in LMS. Lastly, many lecturers in HMT believe training is essential to know how less popular LMSs features worked. This concurs with Lavidas, Achriani and Komis (2022) who argue that less technical lecturers waste a lot of time trying to investigate how to complete certain operations.

6.1.4 Attitudes

According to Alghamdi & Bayaga (2016), the success of technology innovations within educations is highly reliant on the attitudes of lecturers. In this study, findings indicate that although lecturers experience some challenges with the use of LMS, most lecturers display **willingness and more determination to use the LMS** and are more **motivated** with **increased curiosity** to use the LMS, which implies that for these lecturers the benefits far outweigh the experienced challenges. This supports Albirini's (2006) finding that lecturers with positive attitudes tend to be more comfortable using the technology and show readiness to overcome any experienced difficulties. However, one lecturer indicates that even though they view the LMS as useful, they are not enthusiastic as their course delivery is mainly in-person. This concurs with Irfan et al. (2020) who claim that the LMS's inability to fully support some subject areas makes it less desirable, and unpleasant to some lecturers/faculties leading to minimal use.

Another possible reason for reticence may be attributed to the **mandatory use of the LMS.** According to Mpungose (2020b) mandatory affects willingness and leads to people not utilising the LMS to its potential. Findings also indicate that lectures' unwillingness to use LMS result from the challenges they experience in regard to **infrastructure, system,** and **time constraints.** This finding concurs with Coleman and Mtshazi (2017) who found that some features of the LMS were not intuitive, therefore lecturers found it not easy to use as a result it demanded a lot of time to learn in order to use it optimally.

6.2 Skill

Skill was used to understand lecturers' skills and experience using LMS (Knezek and Christensen, 2016), key findings that emerged were lecturers' competencies and skills levels. Findings indicate that all lecturers believe that they **have the necessary LMS competencies** to perform different operations related to course management, setting up communication channels and general course administration tasks necessary to run a course. This finding is consistent with Coleman and Mtshazi's (2017) findings where all lecturers reported ability to satisfactorily complete their tasks on the LMS.

In terms of **skills level**, findings indicate that CLM lecturers use the LMS more extensively in their teaching and believe they possess advanced skills, whereas in HMT the skills level are more varied ranging between low and good. This finding concurs with literature that states that lecturers with greater technical skills are likely to be more confident in online teaching than those who are not (Bove & Conklin, 2020; Dlalisa & Govender, 2020).

6.3 Tool

In this study, Tool was used to understand access and availability of technology (Knezek & Christensen, 2016), as well as the extent of technology use (Farjon et al., 2019). The finding that emerged from this construct were the acknowledgement of LMS features, underutilisation of the features, LMS operations and LMS availability and support.

6.3.1 LMS awareness and use of LMS Features

Findings indicate that even though lecturers are aware of multiple LMS features of the LMS (see Figure 4), many lecturers seem to be primarily using only a few of these features. i.e., announcements, assignments, pages, discussions, data uploads, quizzes, modules, and grades. This finding concurs with Fathema and Sutton's (2013) study that found document uploading and grade posting were the most frequently used LMS features, while many other LMSs such as discussion, collaboration and attendance are underutilised (Washington, 2019; Dlalisa & Govender, 2020).

Findings indicate that the reasons lecturers mostly use these specific features over others is because of the benefits they get from them, first, is the convenience to efficiently perform different operations via announcements, modules, assignments, discussions, quizzes, grades, and people. This finding is consistent with Coleman and Mtshazi (2017) where findings indicated that lecturers found LMS to be convenient and easily allowing for lecturers to publish information. The second benefit lecturers indicate is **keeping students informed and engaged and real time communication** through discussions, announcements, and chats**.** Concurring with this finding is Kumar et al. (2020) who content that lecturers adopt LMSs to perform operations such as hosting discussions and posting information to students. Third finding is the ability for these lecturers to assess student knowledge through quizzes, assignments, and grading functions. This finding aligns with Guangul, Suhail, Khalit and Khidhir (2020) that LMS enables lecturers to measure student accountability, progress, and to support learning. Fourth finding for the frequent use is the ability

for lecturers to easily organise and share content. This finding aligns with existing literature that LMS is helpful for uploading course material to help students prepare for the class ahead of time (Coleman and Mtshazi, 2017).

6.3.2 Under-used LMS Features

Findings indicate varying reasons they do not use some of the LMS features. Firstly, some lecturers find some features to be duplicated and therefore **choose to use other preferred alternative programs outside of the LMS.** Secondly, some lecturers indicate that **current LMS features being used are sufficient to run their course** and have not found a need to explore further. Thirdly, some lecturers indicate that **some features do not align to the nature and requirements of their courses.** According to Dhawan (2020) incompatibility between the technology design (including its features and capabilities) and the method required by the subject area can obstruct the teaching process and create great disparities. Lastly, some lecturers **indicate they don't know how other features work** nor have **enough time** to figure out how other features work. This finding concurs with Zaharah et al. (2020) that when lecturers have limited knowledge or no experience of using the LMS, it affects continuous use. These findings clearly demonstrate a gap that the university and LMS vendors would need to further assess in order to upscale use.

6.3.3 Challenges of LMS Features

Findings indicate that although lecturers continue to use the LMS, there are technical anomalies that make the experience less pleasurable. Firstly, although it's a once off exercise mostly performed at the beginning of a semester, a CLM lecturer finds **creating courses to be time consuming.** Secondly, a CLM lecturer indicated that **excluding students from taking assessments is not possible.** Thirdly, an HMT lecturer indicated that LMS had **limited storage space** for her course content and therefore resorted to using Google Drive. This finding is consistent with Coleman and Mtshazi (2017) where LMS was found to have limited capacity to allow videos files to be saved, this made lecturers to use flash disks as an alternative in order to distribute amongst students. Fourthly, some lecture indicated **formatting issues** when exporting assessment data out of the system. Fifthly, some lecturers indicated **system inflexibility in** regard to accommodating specific requirements that are non-standard. This finding aligns with Irfan et al. (2020) where LMS was found to be inflexible to accommodate specific requirements relating to teaching maths. Lastly, other lecturers indicated an issue with **downloading class lists** and **class list not corresponding**

with the list obtained from the admin office. This finding corresponds with Coleman and Mtshazi (2017) where lecturers reported they were discouraged using the LMS because it has gaps in retrieving information like class list, forcing them to manually add missing students.

6.3.4 Lecturers' perception of LMS support and availability

Findings indicate that except for scheduled maintenance windows and power outages destructions, lecturers agreed that the LMS has been adequately available. However, the ongoing power outages currently experienced in South Africa do have a negative impact on the use of the LMS and is disruptive to the teaching and learning process. Not only is electricity an issue during these outages, also network connectivity and internet speed is affected during this time. This finding is consistent with Mushtaque, Rizwan, Dasti, Ahmad and Mushtaq (2021) that amongst other factors, they found electricity load shedding and slow internet speed to negatively affect students' studies in terms of their involvement and online class attendance.

In terms of technical support, findings indicate that the university has effective support structures in place and lecturers are generally satisfied with support turnaround when issues are reported. According to Bagarukayo and Kalema (2015), for LMS use to be fully endorsed amongst lecturers and students, it needs to be supplemented by good ICT support services.

6.4 Pedagogy

In this study, Pedagogy was used to understand lecturers' style of teaching and their belief system in regard to LMS. The findings that emerged from this construct were different lecturer teaching styles, beliefs about the role of technology in teaching and the alignment/non-alignment of LMS to their teaching styles.

6.4.1 Lecturers' Teaching Styles

According to Atma, Azahra, Mustadi and Adina (2021), teaching styles need to be adjusted according to learning objectives and students' differences in terms of level and pace of students, content, and structure of the course. While findings concur with some lecturers reporting they adopt different styles depending on the size and level of the class and the content being taught, various specific teaching styles emerged. Firstly, some lecturers indicate they use a more **interactive style** of teaching to drive interaction and application of the course content. This finding is in keeping

with Senthamarai (2018) who claims that interactive teaching methods stimulate attention and participation amongst students. Secondly, other lecturers report they use a **discussion style** approach where students are given material prior to the class to give students time to discuss and engage on the content shared. So too, this concurs with the Butt (2014) who states that this approach allows more time for instructors to apply the concepts and knowledge than just lecturing students. Thirdly, some lecturers indicate that a combination of styles, with **traditional** being used to cover the theoretical part of the course and **practical approaches** for application and practical-oriented subjects especially in HMT. This in keeping with Bietenbeck (2014), Coleman & Mtshazi (2017) who found that traditional teaching styles are still valuable as they are more effective in teaching maths and science type subjects. These findings suggest that while lecturers may possess a dominant teaching style, other styles may be used when appropriate.

6.4.2 Role of Technology in Teaching

Findings indicate that most lecturers believe that technology is **essential in education and an enabler** to improve the teaching and learning process. This finding concurs with Sadeghi (2019), Sultana and Haque (2018) who state that integrating technology in education is a necessary strategy to foster innovative changes in current teaching and learning methods. Even though most lecturers demonstrate high beliefs about education, findings indicate that some lecturers still believe face-to-face interaction with students is more valuable and thus caution that technology should only be used to support traditional methods. This finding concurs with Almanar (2020) who argues that despite the flexibility afforded by online learning, students do not necessarily gain more from online teaching and learning than face-to-face contexts.

6.4.3 LMS and Lecturers' Teaching Styles

Findings indicate that **CLM lecturers believe the LMS aligns with their teaching styles** as it **allows for sharing learning material and catering for different ways of engagement**. This finding aligns with Kumar et al. (2020) who state that LMSs were perceived to be advantageous as they enable different ways to engage and interact with students. However, lecturers in HMT appear to have disparate views on the alignment of the LMS to their teaching styles. to be aligned as it benefits them to perform operations such as manage communication and document management. This is in alignment with existing studies where LMS was found to be enabling lecturers and

students to create and access academic content in parallel with other commitments and responsibilities, as they can communicate and exchange information quickly and flexibly (Gunawan et al, 2019). Other HMT lecturers indicate that the **LMS does not align to current teaching methods** as they are a practise-based program. This finding is consistent with Mhungu (2018) who states that for certain subjects and lecturers, where learning by doing and physical engagement with students is required, LMSs are not fit for the purpose.

6.5 Conclusion

This section commenced by presenting a brief overview of the study, followed by findings that came out of each construct of the adopted model. The first construct that was discussed was Will, under which findings on beliefs, benefits, challenges, and attitudes of lecturers were discussed. Next, findings on the skills of lecturers were discussed. Following that, Tool findings were presented discussing in detail the awareness and use of different LMS features, LMS features that are underused, challenges lecturers face with the different LMS features, concluding with the perceptions that lecturers have on support and availability of the LMS. Lastly, findings on pedagogy were presented with a specific focus on lecturers' general teaching styles, their beliefs on the role of technology in teaching and concluding with a discussion of whether LMS aligns to their teaching styles.

7. CONCLUSION, LIMITATIONS AND FUTURE RESEARCH

This section presents conclusion for this research, it first provides an overview of the study detailing the research problem, gaps in literature, objectives and the conceptual framework applied. Following this, a conclusion on sub-questions is presented, followed by contributions, limitations, and recommendations for future research.

7.1 Research Overview

The integration of ICT innovations in education has become increasingly popular and pervasive (Bai, Li & Liu, 2021), enabling the teaching and learning processes to evolve into online platforms (Valdés et al., 2021), distance, and blended learning environments (Røe et al., 2022). LMSs is a technological innovation that has been widely adopted across many institutions (Aldiab et al., 2019; Letseka et al., 2018; Papadakis et al., 2018) that provide an efficient and effective way to store, manage, share academic resources and knowledge (Bradley, 2021). Due to the closure of educational institutions as a result of COVID-19, the use of LMSs grew rapidly (Gamede et al., 2021; Mpungose, 2020), resulting in LMSs moving from predominantly playing a supporting role to being central to offering continued teaching and learning (Kele & Mzileni, 2021). Even though the COVID-19 pandemic and its associated restrictions are now disappearing and in-person learning is being resumed (Alawamleh et al., 2022; Li et al., 2022), LMSs remain a relevant and significant part of the higher education learning system as they offer options for hybrid teaching and learning with virtual possibilities including the ability for students and lecturers to interact beyond physical limitations (Al-Ataby, 2021; Al-Ataby & Al-Nuaimy, 2019). Irrespective of the financial constraints facing higher educational institutions (Friga, 2020), institutions are investing large amounts of time and money to accelerate the use of LMS for online and blended learning (Asarta & Schmidt, 2020; Dhawan, 2020; Krishnamurthy, 2020). However, in spite of the institutions' efforts, LMS implementations are often underutilised (Washington, 2019) and not used extensively for core teaching and learning activities (Alghamdi & Bayaga, 2016).

Hence, this study aimed to bridge the gap in existing literature by answering the main research question: *What are different lecturers experiences' of and extent of use with Learning Management Systems within a tertiary education in SA during and post COVID-19*. Furthermore, the study aimed

to describe lecturers' perceptions, experience, and extent of LMS use, while exploring the underlying reasons lecturers find certain LMS features beneficial and others challenging. The study adopted Knezek and Christensen's (2016) Will, Skill, Tool, Pedagogy (WSTP) model, as the theoretical framework. Figure 7.1 provides an overview of the WSTP model used for this research.

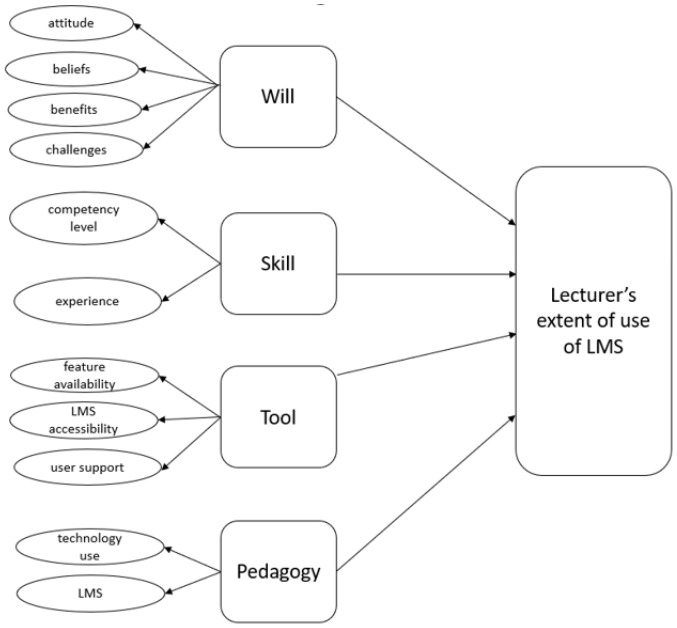


Figure 7.1: Adopted WSTP Model

7.2 Reflection on WILL

There is a mutual belief amongst lecturers that **LMSs are valuable and contribute positively to their teaching** although they are seen to be **inflexible** with **limited functionality** to be able to fully accommodate lecturers' needs**.** Findings indicate varied opinions between lecturers who teach creative subjects and those teaching **technology type subjects**. Lecturers in technology faculty seem to have previously used LMS before the pandemic and appear to **appreciate and rely more on the LMS** post pandemic while those in creative faculty appear to have not used much LMS before the pandemic and are **less inclined to make use of the LMS post COVID-19**. This variation

confirms that lecturers with proficient technology skills are less intimidated by LMS and tend to use it more while those who are not tech savvy tend to struggle and resorting to finding other ways (Lavidas et al., 2022).

The attitude from most lecturers reflects willingness and more determination to use the LMS despite infrastructure, system, and time constraints. Important to note is that some lecturers feel that because the LMS use is mandatory, their attitude towards the tool is more neutral. Coming more strongly from HMT, is that even though they see LMS as useful, some lecturers indicate that the **LMS does not align to current teaching methods** as they are more practise-based than technology centred.

7.3 Reflection on TOOL

7.3.1 Features

Findings indicate that lecturers have vast awareness of the different features of the LMS, however despite these features being known, they appear to only be using a selected few, leaving majority of the features neglected and underused. It appears that convenience, **real time communication** and **keeping students informed and engaged** are the major driving factors for frequent use of these features. On the other hand, features are neglected because selected lecturers feel that the **current LMS features being used are sufficient to run their course**, implying that they do not see a need to explore further than their current use. Another set of lecturers indicate to be using **other preferred alternative programs outside of the LMS,** which implies that they have become comfortable with their old ways of working and are not prepared to switch as long as they feel that the old ways are satisfactorily serving them. Other lecturers attribute underutilisation to not having knowledge about **how other features work,** this finding indicates a need for the university to conduct more frequent refresher training sessions. Another reason emerging from findings is lack of time which implies that lectures are finding themselves conflicted in terms of diving their time between exploring how features work and the actual teaching especially for those lecturers whose teaching is studio based. Even more critical are lecturers who indicate that **some features do not align to the nature and requirements of their courses,** this finding indicates that not all LMS features are suitable for a course, therefore the evaluation of use should first be based on the relevance and suitability of the feature to the course.

7.3.2 Benefits

Findings indicate similar benefits as with existing literature: the ability to upload and share learning material (Coleman and Mtshazi, 2017), flexibility to organise course content (Bagarukayo & Kalema, 2015; Coleman & Mtshazi, 2017), convenience (Kehrwald & Parker, 2019; Ghilay, 2019; Sackstein et al., 2019; Prasojo et al., 2020) and ease of use (Coleman & Mtshazi, 2017).

7.3.3 Challenges

Although lecturers continuously make use of the LMS, findings indicate new and existing challenges that lecturers encounter relating to how the system is designed, how certain functions work, infrastructure constraints and shortage of skills. The LMS is indicated to lack ability to display **confirmation messages** upon completion of an LMS operation and not too flexible to accommodate different course structures. As well, some lecturers reported it was not easy to access previous year's data. Consistent with existing findings, the LMS is found to have **limitations relating to uploading and exporting data (**Alsubaie et al., 2022) and **consumes large amounts of data** which restricts the use of the LMS **(**Mlitwa and Ogundaini, 2022). Furthermore, some LMS features were found to be poor in regard to available data sorting options and skewed formatting when data is exported out of the system. In regard to LMS functionality, LMS was found to be **inflexible** to accommodate different course requirements and **the BigBlueButton web conferencing feature** is observed to be not working properly. In regard to infrastructure, findings are consistent with existing literature that **availability of power**/load shedding (Rana et al., 2021) and poor **network connection speed (**Mtebe and Raphael, 2018) limit the availability of the LMS.

Finally, findings indicate that some lecturers feel overwhelmed by the abundance of different features that the LMS presents, making them realise that they did not have adequate skills to be able to make full use of the LMS. A number of existing studies concur that lack of skills is one of the major challenges in LMS use (Modise and Molotsi, 2022; Dlalisa & Govender, 2020; Mpungose, 2020b).

7.4 Reflection on SKILL

7.4.1 Lecturers' LMS Skills

Although all lecturers appear to be competent enough to complete different operations relating to course management, setting up communication channels and general course administration tasks,

findings indicate different skills levels between technology and creative department lecturers. In the technology department, lecturers appear to all have advanced LMS skills while in HMT skills range between low and good. This shows that the educational background of CLM lecturers in terms of general technology use has a positive contribution in the use of LMS. The difference in skills that is found in humanities is because their core interest is not deliver their course through LMS, they are clear that their courses require them to be in physical contact with students, therefore, they regard LMS as just a supporting tool to their creative work.

7.4.2 Lecturers' LMS experience

Lecturers in the HMT faculty appear to have only started to meaningfully use the LMS during the pandemic and as a result they were less familiar with the tool and struggled to adjust with the transition to fully use LMS during the pandemic. Post pandemic, although they have made good use of the LMS during the pandemic, they appear to be reverting back to using less of the LMS to use more of contact sessions. This confirms that the LMS does not fully meet the requirements of their course. With CLM lectures, findings indicate previous use of the LMS before the pandemic, thus, their transition into LMS during the pandemic was reasonably seamless. During the pandemic, findings indicate that some of these lecturers began to **appreciate and rely more on the LMS** as a result **increased their curiosity and exploration of different functions and capabilities of the LMS.** Post pandemic, although some lecturers warm against full reliance on technology, some of these lecturers appear to have developed even more interest to **use the LMS more extensively.**

7.5 Reflection on PEDAGOGY

Findings indicate that lecturers are not fixed to specific teaching style but adapt different styles according to the **size of the class, level of the class** and **content being taught.** Different teaching styles have emerged from the findings, first, the teaching preference coming out of the findings is the interactive teaching style which is believed to be effective in driving application of the course content. Next, is a discussion style approach where students are given material prior to the class and class sessions are used to discuss and engage on the content shared. Last, is a traditional teaching style where a lecturer traditionally delivers a lesson to students. Overall, lecturers appear to be using a combination of these different styles to deliver the different components of their courses.

7.6 Contribution of the study

7.6.1 Theoretical contributions

Firstly, the study contributes to the existing body of knowledge in regard to lecturers' use of LMSs. Secondly, the use of the WSTP model as the theoretical framework provides other researchers with empirical work on how to apply the model to LMS use.

7.6.2 Practical contributions

Firstly, for decision makers at tertiary institutions, who make large financial investments to procure and adapt LMSs to ensure they are fit for purpose and accommodate the needs and requirements of all faculties, this study is important as it highlights that LMSs do not automatically benefit all lecturers, rather it is essential to consider the needs and requirements of each faculty. Secondly, given that LMSs have been widely implemented in higher education institutions long before the COVID-19 pandemic, the study provides a comparison of use between and post COVID-19 periods to determine if there was a peak of use when learning was 100% online and if that peak is sustained post COVID-19. Thirdly, the study provides an understanding of the different features that are commonly used and reasons why the rest of the LMSs features are underutilised. Lastly, it is crucial that appropriate, frequent and faculty specific training is given to the lecturers to assist in greater awareness of the different features and ways to use the LMS.

For LMS vendors and the development team responsible for the design and usability of the product, the study highlights features and functionalities that are not properly working, thus negatively impacting the user experience. These issues include: (i) display of confirmation messages when an LMS operation is completed, (ii) provide easy accessibility to archived data, (iii) remove restrictions on the type of data that can be uploaded into the system, (iv) allow more flexibility to sort data in various ways e.g., class lists, (v) address formatting issues when exporting data is exported out of the system e.g. quizzes, (vi) address performance and alignment issues with integrated systems e.g. BigBlueButton and external databases.

For lecturers, as higher education institutions move into hybrid learning, lecturers need to reflect on how they can more effectively incorporate LMS into their current pedagogic activities.

Furthermore, lecturers need to take interest in developing their skills set in order to explore and take advantage of all that the LMS has to offer.

7.7 Limitations

Firstly, as this study aimed to understand lecturers' perceptions, experience, and extent of use of LMS, data was only collected at a higher education institution that had previously rolled out the LMS before the COVID-19 pandemic, therefore perspectives on LMSs from other public universities without LMSs prior to the pandemic have not been addressed. Secondly, even though saturation was reached, as only two faculties participated in the research, it is possible that lecturers from other faculties would have presented different views and experiences of the LMS. Thirdly, as data for this study was collected between December 2022 and February 2023 when academic activities had ceased, it is possible that lecturers' reported use and experiences may not be consistent with actual events experienced during the course of the academic year. Fourthly, as lecturers in CLM seem to be more tech savvy than in Humanities, it is possible that comparing technology lecturers with other technology lecturers in a different university may have produced different results. Lastly, as data was collected through self-reported interviews, it is possible that participants may not have accurately reported their beliefs and extent of LMS use.

7.8 Future research

Firstly, as data was only collected at one institution, by including other higher education institutions that used LMS for the first time during the COVID-19 pandemic, may provide a more holistic view of lecturers' experience and extent of use within the country. Secondly, the inclusion of other faculties within the university may offer more in-depth and varied views of LMS. Thirdly, as age and gender is seen to play a role in technology use, including more varied demographics may provide more holistic insights into lecturers' use of LMS. Lastly, as LMSs differ, future studies could collect data at institutions with different LMSs to compare lecturers' experiences.

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APPENDICES

APPENDIX A: ETHICAL FORMS

Appendix A-1 Participation Letter

(Date to be inserted)

Dear Lecturer,

I am currently doing my Masters at the University of Witwatersrand in the School of Economic and Business Sciences. The emergence of Covid-19 and how the education sector quickly had to adopt and fully rely on online learning during lockdown has spiked my interest to investigate *lecturers' experiences, beliefs, and attitudes towards Learning Management Systems (LMS).* Aside from its academic value, the study findings may also help inform higher education institutions and LMS vendors about lecturers' experiences using the LMS.

As a lecturer, you are invited to take part in this study so we can capture your experience using LMS during and post Covid. Your participation is entirely voluntary and involves no risk, penalty, or loss of benefits whether or not you participate. If you agree to take part, you will be asked to participate in an interview, during the interview you may refuse to answer any questions that you feel uncomfortable with answering.

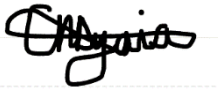
The interviews are confidential, your name will not be disclosed as a pseudonym will be used to report any of the findings. If you agree to participate in the interview, arrangements for the interview will be made at a time and place that is suitable for you. The interview will last approximately between forty-five and sixty minutes.

With your permission, the interviews will be recorded, and notes will be taken. No one other than the researcher and supervisor will have access to the recordings or notes taken. To ensure your confidentiality, your name and personal details will not be disclosed. It will not be possible to trace responses back to any individuals. The recordings and notes will be kept until no longer needed for producing publications.

Your honest answers are important and there are no right or wrong answers.

Thank you for considering participating. Should you have any questions, or should you wish to obtain a copy of the results, please contact me on 082-515-4282 or email 2116854@students.wits.ac.za or my supervisor Dr Suzanne Sackstein on 011 717 8158 or suzanne.sackstein@wits.ac.za.

Regards



Nwabisa Mfingwana,

Appendix A-2 Informed Consent

1. **Project information**

1.1. **Title of research project:** Learning Management Systems within South African higher education lecturers' experiences and extent of use prior, during and post COVID-19

1.2. **Researcher details:** Nwabisa C. Mfingwana, Faculty of Business Sciences, email: 2116854@students.wits.ac.za phone: 082-515-4282

1.3. **Research study description:**

(i) The research aims to describe lecturers' perceptions, experience, and extent of use of LMS: pre, during and post Covid-19 so that a comparison can be drawn between these time periods to determine how it has influenced LMS use. The study also aims to understand the underlying reasons lecturers find certain LMS features beneficial and others challenging.

(ii) Participants will be invited to take part in an interview lasting approximately between forty-five and sixty minutes in which questions will be asked related to their beliefs and their experience of using LMS features for teaching purposes.

(iii) There are no risks to participants as no names and personal details will be disclosed and it will not be possible to trace responses back to any individuals.

2. Informed consent

2.1 I, *(name of participant)* _____ hereby voluntarily grant my permission for participation in the research as explained to me by Nwabisa C. Mfingwana.

2.2 The nature, objective, possible safety and health implications have been explained to me and I understand them.

2.3 I understand my right to choose whether to participate in the research and that the information furnished will be handled confidentially. I am aware that the results of the investigation may be used for the purposes of publication.

2.4 Upon signature of this form, the participant will be provided with a copy.

Signed: _____ Date: _____

Witness: _____ Date: _____

Researcher: _____ Date: _____

Appendix A-3 Permission Letter

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

OFFICE OF THE DEPUTY REGISTRAR

01 December 2022

Nwabisa Mfingwana
Student Number (2116854)
Master of Commerce
School of Business Sciences

TO WHOM IT MAY CONCERN

"Learning Management Systems within South African higher education: lecturer's experiences and extent of use during and post Covid-19."

This letter serves to confirm that the above project has received permission to be conducted on University premises, and/or involving staff and/or students of the University as research participants. In undertaking this research, you agree to abide by all University regulations for conducting research on campus and to respect participants' rights to withdraw from participation at any time.

If you are conducting research on certain student cohorts, year groups or courses within specific Schools and within the teaching term, permission must be sought from Heads of School or individual academics.

Ethical clearance has been obtained. (Protocol number: CBUSE2061)

Research Expiration: (31 December 2025)

Nicoleen Potgieter
University Deputy Registrar

Private Bag 3, WITS, 2050, South Africa | T +27 11 717 1204/8 | E nicoleen.potgieter@wits.ac.za | www.wits.ac.za

Appendix A-4 Ethical Clearance Certificate

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

SCHOOL OF BUSINESS SCIENCES ETHICS COMMITTEE
CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: CBUSE2061**
PROJECT TITLE	Learning Management Systems within South African higher education: lecturer's experiences and extent of use during and post Covid-19.
INVESTIGATOR	Nwabisa Mfingwana
SCHOOL/DEPARTMENT OF INVESTIGATOR	School of Business Sciences
DATE CONSIDERED	16 November 2022
DECISION OF THE COMMITTEE	Approved Unconditionally
RISK LEVEL	Minimal Risk
EXPIRY DATE	31 December 2025

ISSUE DATE OF CERTIFICATE 22 November 2022 **CHAIRPERSON** _____
(Neetu Ramsaroop)

cc: Supervisor: Dr Suzanne Lee Sackstein

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** returned to the Chairperson of the School/Department ethics committee.

I fully understand the conditions under which I am are authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

_____ 22 / 11 / 2022
Signature **Date**

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

APPENDIX B RESEARCH PROTOCOL

To investigate *Will*, these questions were asked:	1. Please describe your general views on LMSs?
	2. Please explain whether your perception of LMSs have changed during and post COVID-19?
	3. In your opinion, what are the advantages and challenges you have experienced using LMS?
	4. Please explain what makes you enthusiastic or unwilling to use LMS?
	5. Please explain whether your experiences with using the LMS have motivated or demotivated you.
To investigate *Skill*, these questions were asked:	6. Please describe a situation where you felt satisfied with an LMS operation.
	7. Please describe what your skill level is in regard to using the LMS
To investigate *Tool*, these questions were asked:	8. What features are available on the LMS?
	9. What are the primary LMS features you use?
	10. Please explain what benefit you derive from using these features
	11. What other LMS features exist, but are not used by you?
	12. Please explain why you do not use certain LMS features.
	13. What would be helpful to motivate use of all the LMS features?
	14. Please describe a situation where you felt frustrated with completing an LMS operation
	15. Please describe the LMS support available.
	16. Please describe your access to the LMS and the associated features.
To investigate Pedagogy, these questions were asked:	17. Please detail your lecturing experience
	18. What subjects do you teach?
	19. How would you describe your teaching style?
	20. Please explain your beliefs about integrating technology into your teaching
	21. Please explain whether you believe LMSs align with your teaching style?

APPENDIX C SAMPLE TRANSCRIPT

Interview 5 – Lizzie

Nwabisa Mfingwana
Hi Lizzie, how are you doing?

Lizzie
Good thanks

Nwabisa Mfingwana
Can you just tell me more about your lecturing experience?

Lizzie
OK, so I've lectured for a long time, 29 years and it started being very sort of stand in the front and deliver and it's depending on the course that I'm lecturing it. It will become more facilitative, or it will become more content transfer, but that's changed a lot since COVID, so now that content transfer doesn't really happen, so it's a lot more facilitative stuff and a lot more application going through examples with students, but as I said, it depends on the on the particular course I'm lecturing. I think that I like very much, one of the things I like for my lectures is engagement with students, so I don't like to be standing there just talking to students, I like us to be having more of a conversation and that goes with whatever I'm lecturing. I would say that's my overarching thing is to have more of an engaging conversation, rather than a lecture.

Nwabisa Mfingwana
what subjects do you teach?

Lizzie
So, I teach first years, I teach them programming. I then teach second years a bit more advanced programming stuff and then I do an honors course in IT ethics.

Nwabisa Mfingwana
My third question is to find out more about your teaching style, you have touched on it a bit earlier, you said you like more of an engagement type of environment where you don't necessarily give a lecture, but a session that is more interactive. *Am I correct to say that?*

Lizzie
You know what? I think it's very difficult to give a particular, you know, because for example, lecturing a class of 300 in first year is very different from the group that I would have in honors, which is about 30. So, you naturally have to adapt your style because of just the size of the class. So, it's not a one size fits all for everybody, one does have to adapt depending on the on the class and also the content that I'm doing. It lends itself far more to debate engagement discussion versus going through examples of programming with first year, so they're very, very different subjects, the style also has to change.

Nwabisa Mfingwana
Now, I just want to understand more your beliefs about integrating technology into your teaching.

Lizzie
I certainly believe, let's assume I'm lecturing history. I just completely believe that there's a place for technology and I believe that we should use the tools that are available to us. I think one can use technology to extend what one does in the classroom so it doesn't just have to be in the classroom because that's sometimes difficult, but certainly one can use technology in the entire course to do different things. So, I think everybody should be using it because it enriches the experience for everybody, and I think that also one should change with the times and not just doing it for the sake of it but being able to more cleverly incorporate technology and use technology in whatever course you deliver. And so, yeah, I think there's a place, I don't believe that it's again an all or nothing, I don't think that anybody gains from just technology or no technology I think one has to learn how best to balance the two.

Nwabisa Mfingwana
So now I want to, then I want to know your beliefs about LMS

Lizzie
I think yes, I think learning management systems do align with my teaching style because they allow for different ways of engagement. So, when I said to you, I like to have an engaged experience, I think that learning management systems allow you to have that and to do it in different ways, so learning management systems just extend what is possible to incorporate technology, it just makes it so much easier to bridge the gap between the students and yourself by using the LMS. So, I use it, I think it's a good example to use, it is as a bridge because you need to cross over and add things in and that the learning management systems give you that, give you options which would possibly make things a lot more time consuming, more difficult, more technically challenged than if you didn't have it for example.

Nwabisa Mfingwana
I think you've touched on my next question, what is your general view on LMS's?

Lizzie
I think LMS is a great tool with lots of capabilities that offer efficient ways to support the teaching process

Nwabisa Mfingwana
So now I just want to understand whether your perception of LMS have changed during and post COVID.

Lizzie
I wouldn't say that my perception has changed but what I have found myself doing which I think is because we kind of had to do certain things, I'm finding that I'm using the LMS a lot more than I might have before. So, I wouldn't say my perception has changed, but certainly I'm making better use of the LMS than I did in COVID, but I've been using LMS for years.

Nwabisa Mfingwana
So, in your opinion, what are the advantages and challenges you have experienced using LMS?

Lizzie
The advantages I've touched on, so it gives you the capabilities to do things in different ways and more ways. So, let's just say a simple example, if I want students to engage with each other, I can set up discussions. Well, then to do that, they don't have to do that in person, they can do it whenever they want to and before we were very reliant on either the students meeting face to face in person or they would have to then sort of like use sort of third, let's say not all other parties ways of communicating or collaborating, and then this is just help to do stuff like that, so that's just one example.
I mean, there are many examples of things that you can do on the LMS, so the advantages are that. Features of the LMS allow you to do so many different things in so many different ways, and it comes down to a

fundamental thing about education is that ultimately, not everybody, I'm going to use the word 'understands', but it's not it's not really the right word I'm looking for. You know people learn and
I mean people teach differently so I think because you've got such diverse method, my first-year class of 300 students are very diverse, so I think the capabilities and features of the LMS allow you to reach people in different ways, which might more easily fit to other people's learning styles, for example.
So I think broadly that would be the probably the biggest advantage and obviously also one has to look at things that are convenient, I mean, I can be working on stuff at midnight and I can post it and students can also do things in daytime, so that helps with many things and I do not think that these things replace the classroom and I've a very strong believer of how important the face to face is in education. Particularly I've found with my first-year students and particularly with the programming that students need, they need to be in person so yes, so.
I would not say major challenges but I think that one thing that I've found, and I think it's a hangover from COVID, is that students need to get back into the routine of a face-to-face thing, because if students rely only on LMS then they are missing out so, one has to balance what you post for example, so you've got to put enough there, but you've also got to make sure that you want them to come to class, so you don't want to post. Because they're not online course, so it's a different thing if it's an online course, this is not an online course, so I think with any course you have to, if you're not doing it online, you have to balance what you put on and what you're going to do face to face. Sometimes if we look at other disadvantages of LMS or challenges, let's rather let's say just advantage of, but sometimes technical things you know there might be a little bit of a thing about the particular LMS that you're using that it doesn't do something. I'll give you an example, when we started with Ulwazi, the class was in first name order, and you couldn't get it in surname. You know, that sounds like something really minor, but when you've when you've got a class of 300 and the class list, you're getting from the mark system is by surname and then the WISC is giving you by first name, there's sometimes you have to, and one then gets on to the Internet and you find a way to get around it. But yeah, it's sometimes just little things like that they have fixed that by the way.

Nwabisa Mfingwana
You felt really satisfied with performing a specific LMS operation.

Lizzie
So, in a previous LMS I would have all my resources together, so all the all the notes together. For example, all the tutorials together, all the readings together just as an example, yeah. And what you have now is this ability to package these things to make them all fit together in a way that makes sense. So, and I'm sure you experienced that in your class, so your module or your page has everything you need, I wouldn't say I struggle to get that one going, it was just something completely new because in our previous one, as I said, it was very much more tight of resource that was put together, whereas now it's very much what am I doing in this particular session and it can be a video and it can be a reading and it can be a whatever and I put it in one place. So, I think that in itself, was quite satisfying because you know that students don't have to go look for different things in different places, they can find it all in that one place

Nwabisa Mfingwana
And then frustration, are you happy with me, putting the frustration as that example that you gave me earlier about the student names only arranging by name not by their surname?

Lizzie
Yeah, sure, and I can actually think of others, so, if you go to and I mean obviously this is not something you're seeing as a student, but as a lecturer, you can get in previous mess that I used, for example, if you had the list of people in the course, you could arrange by the date that they last accessed, for example, you can't do that in Ulwazi, Ulwazi has got some fantastic features that are a lot better than a lot of others, but there's some things that are not good, and filtering, I'm just trying to think because I actually posted to the support people last year some time and I can't remember. There's a lot of times that you would like to arrange things

in a certain way and there's some capabilities Ulwazi does not support. So those kinds of things that are not about teaching, it's more about the navigation, let's put it that way.

Nwabisa Mfingwana
What is your skills level in regard to using the LMS

Lizzie
Maybe advanced, I'm very comfortable

Nwabisa Mfingwana
So, having had the experiences you've had using the LMS, would you say they have motivated or demotivated you?

Lizzie
I think motivated, in fact, sometimes it makes you want to find out more because you think, OK, well, I mean, the first time it happened, I was like, no, what am I doing wrong? So, I think in some ways it is more motivating for you to find out to do things. So now when I come across a snag I will try and there's a big, uh, wise community and I'll go and investigate. So, I think I would say it actually in way can be more motivating.

Nwabisa Mfingwana
What are the features that you know of that are available on the LMS?

Lizzie
Oh, my gosh, because there's a lot, let's start with just the ability to actually, as I said earlier, post things that that are organized in a way that's logical makes more sense than yeah. Then things like the chat function, which allows me to chat in real time with students. There are discussions where one can post a question or student can post a question and a whole lot of people can answer. I use the Quizzes a lot. So chat discussions, quizzes, assignments, modules and pages, Groups section.

Nwabisa Mfingwana
And then the primary LMS features that you use?

Lizzie
All right, I use all of those that I've told you except for groups i.e. chat discussions, quizzes, assignments, modules and pages

Nwabisa Mfingwana
The next question that I have is to just understand the benefits that you derive from these features.

Lizzie
Actually, the chat I generally used for consultations. So, it doesn't stop the students talking to each other, but generally it tends to be more of a Q&A with me. But yes, the students can and do actually talk. The discussion, however, is more about the students, there is more discussion amongst them, more than the chat, but the discussion is not live. You see the chat is live. The discussion is yeah, posting whenever so I think that's probably why it tends to be less. The chat tends to be less between students whereas the discussion is more between students, yeah and the quizzes.

Nwabisa Mfingwana

What benefit do you get from that as a lecturer?

Lizzie
OK, so one of the big benefits and I think again maybe COVID pushed us in this direction is that when you got your students that going through material on their own, whether or not they understand, or if they've got questions, et cetera. so that is one thing we lost with face to face is that ability of a lecture to read the audience to see in the class what is happening, so what the quizzes do is give me some indication of concepts that students may not have understood whereas in face-to-face situations, do you look at their faces and be like, these ones don't understand. With assignments, it's much easier to track submissions, missing submissions and things like that.

Nwabisa Mfingwana
What other elements features exist but you do not use.

Lizzie
Groups, video conferencing - first of all, because the first-year class is too big and then when it comes to honors, I can do what I need to do in teams, for example.
During COVID, I would do surveys at the beginning of the year with my students to kind of get an idea of where they were, what access they had, what data they had just so that I knew what we were dealing with and what one student told me was 'I've got Internet in the middle of the night in the middle of the road'. So, you know, one can't do something like a video conference then, because that assumption that everybody is on the same page.
When you start getting smaller classes, you can get a better idea, but still even then there might be people, although now the expectation is that everybody is back if you know what I mean so even if you're not, even if I'm doing something not in person, you still have to be able to access it.

Nwabisa Mfingwana
In your opinion, what would be helpful to motivate you to use the features you are not using?

Lizzie
Probably if I found a requirement and that's why my development use of the LMS has come about. And also training would help. I think it's very much dependent on personality and I'll give you an example, I did a blended learning course with the university lasty ear and there were things that were really exciting and I thought, OK I must try some of these and the then the added one more for example, so I think that those kind of courses and I actually even for someone like me who's been doing technology for so long to do a blended course is, I would say it was a refresher or some of it was a refresher, but it was also just giving you insights into different ways of doing things which was a good thing to do.

Nwabisa Mfingwana
So please describe the LMS support available

Lizzie
Yeah, I think it certainly has been good, I think it's also getting better because I think also, it was a new learning management system for the people providing support, so they also have had to learn things and I think the support is good and we have support directly in the faculty but then there's also support through the teaching and Learning Center. There's something at university level, but there's also something at faculty level and I would say, yeah, I've been OK. There has not been one thing that I've thought, oh my gosh, why did I waste my time.

Nwabisa Mfingwana
Please describe your access to the LMS.

Lizzie
I would say better than our previous LMS.

Nwabisa Mfingwana
Which elements features did you use and not use during and post COVID and why? *And I think you said the features you are using now are the same features you used during COVID, am I correct to say that?*

Lizzie
So, I pretty much used the same features during COVID as I am now. So, I think and that's more than pre COVID, so yeah, COVID got me - needing to use certain things and I've continued using them.

Nwabisa Mfingwana
What would you say is the reason why do you still need to continue to use even post COVID when you can address certain things in in person for instance just making an example?

Lizzie
So, I would say because of the realization of how different it is to help students, so the same thing done in more than one way or help students so I can deliver something in class but then I've got it online as a backup, that other option of then being able to watch it remotely online for example, it just gives you options of reaching and engaging with students in different ways.

Nwabisa Mfingwana
Please explain what makes you enthusiastic or unwilling to use LMS?

Lizzie
Never been unwilling…the more it makes my life easier I get enthusiastic to use it more…COVID made me use it more than I used it before…running into issues doesn't discourage but encourages me to find a solution.

Recording time: 52 minutes