FACTORS THAT INFLUENCE A GROUP OF MBChB LECTURERS TO USE BLENDED LEARNING IN THEIR TEACHING

by

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DECLARATION

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Elizabeth Brits

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All glory and honour to God my strength and rock.

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DEDICATION

To my parents who have always encouraged me and believed in me.

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ABSTRACT

Information and communication technologies (ICTs) are globally an emerging development in education. The trend is increasingly to integrate blended learning approaches in higher education institutions to create alternative learning opportunities. Blended learning has the possibility of accommodating students in making learning more accessible and creating a more satisfying learning experience. However, lecturers do not appear to be convinced of the benefits of using digital technologies in their teaching. Digital technologies are often only used for tasks such as word processing and internet searches instead of for the full benefits they can offer in teaching and learning. This raised the question of what the different factors are that influence MBChB lecturers' integration of blended learning in their teaching.

The study took on a qualitative exploratory research design in an attempt to better understand how teachers view blended learning and to possibly identify factors that enhance or inhibit their use of digital technologies in their teaching. The population for this study consisted of the ten module co-ordinators in the third year of the MBChB programme. Semi-structured, individual interviews were conducted with a total of eight participants. All the participants were experts in their respective medical fields, with several years of teaching experience both in the clinical and classroom settings. The participants were from a variety of specialities within medicine, which aided in rich data collection. The transcribed interviews were coded and then themes were grouped by means of a thematic analysis process.

This study identified five main themes with various subthemes. These were meaning-making of blended learning, the medical curriculum, teachers' individual differences, the medical student and institutional factors. It was evident that teachers' dual role as clinicians and teachers as well as their multiple responsibilities influence their behaviour in the implementation of a blended learning approach. It was also found that the learning environment plays a key role in a clinician teacher's implementation of a blended learning approach. Lastly, the importance of faculty development was highlighted and it is clear that teachers need continuous support and development in the implementation process, which implies longitudinal faculty development opportunities.

These findings indicate that blended learning is not necessarily as useful in all learning environments, and that some teachers actually fail to see the usefulness of blended learning in

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the clinical learning environment. However, contextualised faculty development opportunities could inform the affordances of blended learning in the different learning environments.

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OPSOMMING

Inligting- en kommunikasietegnologieë (IKT's) is toenemend ‘n wereldwye ontwikkeling in hoëronderwys. Die neiging is om gemengde leerbenaderings te integreer om sodoende alternatiewe leergeleenthede te skep. Gemengde leer hou moontlikhede in om leer toegankliker te maak vir die student en dus 'n bevredigende leerervaring te skep. Dit blyk egter dat dosente nie oortuig is van die voordele van die gebruik van digitale tegnologieë in hul onderrig nie. Digitale tegnologieë word dikwels slegs gebruik vir eenvoudige take, soos woordverwerking en internetsoektogte, in plaas daarvan om die volle voordele te trek wat gemengde leer in onderrig kan bied. Dit het die vraag laat ontstaan wat die verskillende faktore is wat die MBChB-dosente se integrasie van gemengde leer in hul onderrig beïnvloed.

Die studie het 'n kwalitatiewe ondersoekende navorsingsontwerp gevolg om te poog om 'n beter begrip te vorm van dosente se verstaan van gemengde leer; asook faktore te identifiseer wat die gebruik van digitale tegnologieë in onderrig verbeter of belemmer. Die navorsingsgroep vir hierdie studie het uit die tien module-koördineerders in die derde jaar van die MBChB-program bestaan. Daar is semi-gestruktureerde, individuele onderhoude met agt deelnemers gevoer. Die deelnemers, is kundiges in hulle onderskeie mediese velde, en het ook elk 'n paar jaar onderrigervaring in die kliniese en klaskameromgewing. Die feit dat die deelnemers, verteenwoordigend was van verskeie spesialisvelde in die gesondheidsberoepe, het bygedra tot die insameling van insiggewende data. Die getranskribeerde onderhoude is gekodeer, deur 'n tematiese ontledingsproses te volg, en daarna volgens temas gegroepeer. Vyf hooftemas, asook subtemas, is in hierdie studie geïdentifiseer. Dit sluit in, die verstaan van gemengde leer (meaning-making), die mediese kurrikulum, dosente se individuele verskille, die mediese student en institusionele faktore. Die dosente vertolk beide die rol van medikus sowel as die van dosent. Die veelvuldige verantwoordelikhede beïnvloed hul benadering tot die implementering van gemengde leer. Die bevinding is dat die leeromgewing 'n sleutelrol speel by die kliniese dosent in die implementering van 'n gemengde leerbenadering. Deur die beklemtoning van fakulteitsontwikkeling, kom dit na vore dat dosente 'n behoefte het aan deurlopende ondersteuning en ontwikkeling in die implementeringsproses. Dit impliseer langdurige fakulteitsontwikkelingsgeleenthede.

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Ten slotte is die bevinding dat gemengde leer nie noodwendig nuttig is in alle leeromgewings nie, en dat sommige dosente nie die voordele van gemengde leer binne die kliniese leeromgewing insien nie. Gekontekstualiseerde fakulteitsontwikkelingsgeleenthede kan egter die voordeel van gemengde leer binne die verskillende leeromgewings rig en bevorder.

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CHAPTER 1:

BACKGROUND TO THE STUDY

1.1 INTRODUCTION

The 21st century have led to the emergence of digital technologies, which have increasingly changed teaching and learning practices and how higher education institutions (HEIs) approach teaching and learning (Kirkwood & Price, 2014; Mykhnenko, 2016; Liu & Chen, 2017). Veletsianos (2011) argues that this change in teaching and learning practices is made possible through the implementation of a blended learning approach. There is a growing body of knowledge that supports the fact that blended learning can create alternative learning opportunities, accommodating students in making learning more accessible, creating a more satisfying learning experience (Bath & Bourke, 2010; Gounari & Koutropoulos, 2013) and possibly facilitating deep and meaningful learning (Mystakidis, Berki & Valtanen, 2019). Blended learning is defined as the "thoughtful fusion of face-to-face and online learning experiences ... such that the strengths of each are blended into a unique learning experience ... Blended learning is a fundamental redesign that transforms the structure of, and approach to, teaching and learning" (Garrison & Vaughan, 2008:5).

1.2 BACKGROUND

Challenges in the health professions have been evident in the past few decades. Rapid demographic and epidemiological transitions have caused health systems worldwide to struggle to keep up (Frenk, Chen, Bhutta, Cohen, Crisp, Evans & Zurayk, 2010). Professional education has not kept pace with these changes either. Some challenges that have been noticed in HPE are rigid curricula, overworked teachers juggling between clinical duties and teaching students, poor alignment between the needs of patients and competencies of graduates, and outdated assessment practices (Frenk et al., 2010). Over the last few years additional challenges have emerged as the 21st century adds demands that require HEIs to keep up with the changes in teaching and learning in order to foster student diversity, address student engagement and give students greater access to learning. These changes and challenges might call for a redesign of teaching strategies with the careful integration of digital technologies (Veletsianos, 2010).

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HPE has increasingly adopted a blended learning approach (Picciano, Seaman, Shea & Swan, 2012; Staker, Chan, Clayton, Hernandez, Horn & Mackey, 2011; Halverson, Graham, Spring & Drysdale, 2012). Previous studies investigated the impact of blended learning and found numerous benefits to this approach. The literature indicates that blended learning is an effective method of instruction which has the possibility to increase students' performance, skills, attitudes (Ruiz, Mintzer & Leipzig, 2006) and participation (Kenney & Newcombe, 2011; Smyth, Houghton, Cooney & Casey, 2012). Additionally, research has shown that a blended learning approach provides opportunities for the development of non-technical skills such as critical thinking, clinical reasoning and reflection (Poon, 2012; Reiss & Steffens, 2010; Rowe, 2013). Studies comparing blended learning and face-to-face teaching found that students reported higher levels of motivation to learn in blended learning initiatives (Tseng, 2016); this is due to the possibilities digital technologies offer to create engaging learning materials (Cho & Cho, 2014). The flexibility and convenience that learning technologies afford (Rovai & Jordan, 2004) and the asynchronous enabled collaboration and communication (Ellaway & Masters, 2008) aid students' motivation to participate in learning.

The literature often refers to 21st century learning to describe the changing nature of education (Gajjar, 2013). This learning is associated with terms such as personalised learning and differentiation. Essentially, 21st century learning refers to the transition that is taking place in education with the rapidly changing nature of digital technologies focusing on preparing students for a world and a way of working that will look different in the future (Gajjar, 2013). This is consistent with Dewey's view (1938) that education should prepare students for life. The literature has indicated the need for both teachers and students to remain up to date with digital technologies, i.e. using communication tools and being able to interpret and apply new knowledge obtained in digital environments (Doherty, Dromey, Lougheed, Hannigan, Last & Mcgrath, 2018) which could lead to different ways of thinking. The importance of acquiring 21st century skills is emphasised in order to cope in this increasingly demanding world (Griffin, MacGaw & Care, 2012). Individuals in contemporary society are constantly required to work in teams, communicate effectively with colleagues both face-to-face and online, search for information, solve complex problems and work effectively with technologies. These skills are seen as crucial to perform in a work environment in the 21st century (Griffin et al., 2012).

However, these innovative methods may be challenging to implement as teachers in the HPE are often from a background where they are experts in their own field and where they have to

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care for patients or perform research, rather than having to teach. Many of these teachers' professional practice lies outside the educational domain and they have little to no educational training, which could make teaching a daunting task (Swanwick & McKimm, 2010). Clinician teachers face the challenge in HPE to juggle the theoretical aspect and the mastery of critical thinking and clinical reasoning. Teaching in HPE is such a complex, multifaceted concept, but the literature suggests that blended learning is able to bridge the gap between theory and practice by exposing students to authentic learning environments and essentially improving teaching and learning in HPE (Rowe, 2013).

1.3 PROBLEM STATEMENT AND RATIONALE FOR THE STUDY

Despite the positive outcomes of a blended learning approach, the reality is that it seems as if blended learning is not being used for the benefits it holds. Stellenbosch University (SU) invests a substantial amount of money and resources in programmes and interventions to stimulate the use of learning technologies among the teachers. However, many teachers still fail to see the benefit of using technologies.

The other problem is that technology is most often used for tasks such as word processing, internet searches and administrative tasks (Kennisnet, 2011; Letwinsky, 2016) instead of using a variety of digital technologies to create a learning experience for students. Some teachers tend to use the learning management system (LMS) simply as a repository for their content. Wilson, Parrish and Veletsianos (2008) confirm that digital technologies are used predominantly to reinforce traditional didactic teaching instead of rethinking teaching and students seem to show little improvement in learning. The reinforcement of traditional didactic teaching can be seen at SU based on some LMS reports (set of data about how students and teachers use the LMS) and module structures, and it seems that teachers do not use a variety of blended learning tools and pedagogical approaches which are supported by the learning tools in their teaching. Modules are used mainly as a repository for PDF files, Word documents and PowerPoint presentations. These modules do not reflect a blended learning approach. The insufficient adoption of learning technologies has been evident since the early 1990s (Galusha, 1997). Since then, in an attempt to explore reasons for the resistance, numerous studies have been conducted and several barriers have been identified as reasons for the hesitance in adopting learning technologies in teaching and learning such as teachers' digital literacy, the learning curve to work with digital technologies, and the time associated with developing materials (Anderson,

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2012; Bacow, Bowen, Guthrie, Lack & Long, 2012; Lloyd, Byrne & Mccoy, 2012; Doherty et al., 2018).

Investigating reasons why teachers do not implement a blended learning approach can assist in identifying factors that influence teachers' behaviour towards learning technologies and further in identifying needs that have to be addressed in order to achieve better teaching and learning outcomes.

1.4 RESEARCH QUESTION

What are the factors that influence Bachelor of Medicine and Bachelor of Surgery (MBChB) teachers' integration of blended learning in their teaching?

1.5 STUDY AIM AND OBJECTIVES

The main aim of the study was to investigate and identify factors that influence teachers' integration of a blended learning approach in their teaching. The objectives to support the study were:

- To understand how teachers view blended learning
- To explore the possible factors enhancing or inhibiting the use of blended learning

1.6 RESEARCH METHODOLOGY

The research methodology refers to the process and steps that were followed to conduct the study.

1.6.1 Research design

In this study, a qualitative research design, based on the interpretative paradigm (Nieuwenhuis, 2016) was selected in an attempt to understand and capture participants' lived experiences through the investigation of individuals' behaviour. This approach gave me a comprehensive, holistic understanding of the participants and the problem in order to find the rationale behind individuals' behaviour. It also provided the opportunity to report on how individuals understand and interpret the world and how they construct meaning from their personal experiences (Silverman, 2016), which gave me an insider perspective of individuals' view of the world. The

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participants' multiple perspectives and experiences allowed me to explore their understanding of the research problem.

The research was guided by previous studies that investigated behaviour and factors that influence teachers to implement a blended learning approach (Anderson, 2012; Lloyd et al., 2012; Childs, Blenkinsopp, Hall, Walton & Society, 2005; Doherty et al., 2018). The factors that are likely to influence teachers in implementing digital technologies are time constraints and a lack of knowledge and skills.

1.6.2 Population and sampling

The population consisted of the ten module co-ordinators in the third year of the Bachelor of Medicine and Bachelor of Surgery (MBChB) programme. It was decided to make use of total population sampling (Etikan, Musa & Alkassim, 2016). All the participants were experts in their respective medical fields, with several years of teaching experience both in the clinical and classroom settings. A total of eight participants agreed to take part in the interviews (n = 8).

1.6.3 Data collection

Data was collected by means of semi-structured individual interviews, which allowed for an understanding of the participants' thinking process and gave them the opportunity to explore and reflect on their own experiences (Holloway & Wheeler, 2010). This yielded insightful information regarding the research problem as well as insight into the participants' thinking processes (Queiros, Faria & Almeida, 2017) and their viewpoints. Semi-structured individual interviews allowed me to ask probing and clarification questions and to explore issues that came up spontaneously.

1.6.4 Data analysis

Data analysis and coding were done manually. Thematic analysis was utilised for its systematic approach in analysing the qualitative data (Howitt & Cramer, 2008). An inductive approach allowed findings in this study to emerge from the raw data (Strauss & Corbin, 1998) without the restraints of structured frameworks. Codes and themes were identified following Braun and Clarke's six-step framework (2006). This framework provided a structure that allowed for analysis to move beyond only describing what participants said to interpreting it. The data analysis process is described in detail in Chapter 3.

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1.7 ETHICAL CONSIDERATIONS

The research proposal was approved by the Health Research Ethics Committee at the Faculty of Medicine and Health Science (FMHS), SU (S19/04/077). The research conformed to the ethical guidelines of the International Declaration of Helsinki.

Institutional permission was obtained from Stellenbosch University, Faculty of Medicine and Health Sciences. Participation in the study was voluntary and informed written consent was obtained from the participants before data collection commenced.

1.8 SIGNIFICANCE OF THE STUDY

This study identified factors that influence teachers' behaviour and motivation to implement a blended learning approach. It contributes to a better understanding of and insight into how teachers currently use digital technologies in their teaching and why some teachers are reluctant to implement a blended learning approach. The findings could indicate how faculty development opportunities can be customised and how support from the institution might be aligned with faculty-specific needs. Furthermore, findings could inform SU's MBChB curriculum renewal process where adjustments need to be made for sensible implementation of blended learning approaches. Finally, this study may provide guidance on structures that have to be in place before approaching the implementation of a blended learning approach. It identified specific challenges teachers experience with blended learning implementation as well as some benefits. This study challenges HPE to rethink traditional teaching practices.

1.9 STRUCTURE OF THE THESIS

The thesis is structured in six chapters as follows:

Chapter 1: Background to the study – The aim of this chapter was to provide the reader with an overview of the study, including the rationale and study aim and objectives.

Chapter 2: Theoretical perspectives – A critical overview of the literature related to blended learning practices is discussed in Chapter 2 within the context of HPE. The integration of theory concerning the implementation of digital technologies and human behaviour is further discussed.

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Chapter 3: Research methodology – This chapter consists of the methodology, including the study design, data collection and analysis. The complexity of the learning environment of the study is highlighted in this chapter.

Chapter 4: Research findings – The findings are explored in the different themes and sub-themes found in this study, with reference to direct quotes from the transcripts.

Chapter 5: Discussion – Chapter 5 critically considers the major findings that were outlined in the previous chapter against the relevant literature.

Chapter 6: Conclusion and recommendations – This chapter consists of the overall conclusions of the study, followed by the strengths and limitations of the study and recommendations for further research and implementation. This chapter ends off with a reflection and closing remarks.

1.10 LIST OF DEFINITIONS

Below are some terms that are often used in the study. For the purpose of understanding what is meant, the following references and explanations have been provided:

Affordance: The properties and qualities the technological tool can offer in order to clarify how the tool can be used (Norman, 1998).

Asynchronous learning opportunities: Learning occurring at any time convenient to the student (not bound to time and space) (Kitade, 2008).

Blended learning: The "thoughtful fusion of face-to-face and online learning experiences ... such that the strengths of each are blended into a unique learning experience ... Blended learning is a fundamental redesign that transforms the structure of, and approach to, teaching and learning" (Garrison & Vaughan, 2008:5).

Blog: A website or webpage allowing for informal, conversation style posts which could include images, videos, audio and text. Blogs allow readers to comment on the work of the content creator (Wiley & Hilton, 2009).

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Emerging technologies: “Tools, concepts, innovations, and advancements utilized in diverse educational settings (including distance, face-to-face, and hybrid forms of education) to serve varied education-related purposes” (Veletsianos, 2010:12).

Learning-centred approach: The students’ learning is emphasised rather than the content that is taught. This approach gives the students more responsibility for their own learning. They are given the opportunity to regulate their own learning and to become co-constructors of knowledge. The role of the teacher changes to a facilitator of learning (Biggs 2012).

Learning management system (LMS): A software application used as a space to host training programmes and educational courses. The LMS allows for tracking learner progress (logs) (Paulsen, 2002).

Synchronous learning opportunities: Learning occurring at the same time either face-to face or online by means of two-way video, two-way audio or text chat (Rasmussen, 2003).

Twenty-first century learning: Each century comes with distinct educational demands which require new ways of thinking and learning (Gardner, 2008). Twenty-first century learning approaches address these specific changes (Kereluik, Mishra, Fahnoe & Terry, 2014).

Wiki: A website developed in collaboration. Users can edit, create and delete content. Many users can contribute to the same document. Wikis allow for text, video, audio and images (Lundin, 2008).

1.11 CONCLUSION

This chapter aimed to provide the reader with an overview of the study, starting with a description of the problem that this study aimed to address, followed by the rationale and study aim and objectives. Chapter 2 contains a comprehensive overview of the literature and highlights the potential of blended learning in HPE. Theoretical perspectives concerning blended learning are discussed in an attempt to understand human behaviour.

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CHAPTER 2:

THEORETICAL PERSPECTIVES

2.1 INTRODUCTION

The landscape of higher education has changed rapidly in the last few decades. A shift to increased digital technologies in the classroom has disrupted traditional ways of acquiring knowledge. These changes in education require HEIs all over the world to adapt and become more digitally inclined (Liu & Chen, 2017). It might be challenging for institutions to integrate digital technologies in teaching and learning. Some of the challenges could include the unique nature of each learning environment, teachers' different levels of digital literacy and students' ability to learn with digital technologies. However, adapting to changes is necessary in order to embrace and take advantage of the affordances technology offers (Laurillard, 2012). Blended learning is seen as an innovative way to engage students in teaching and learning and is emerging as a global trend in higher education (Allen & Seaman, 2006). It facilitates a continuous learning process instead of a once-off event, which aids in students becoming independent learners by learning outside of the classroom (Eddy, Nor-Aziah & Jasmine, 2014). The aim of this chapter is to provide the reader with a critical overview of the nature of blended learning and the value of its implementation within the higher education context. Furthermore, the role of the teacher in 21st century learning with its changes and challenges is discussed and how interrelated factors influence teachers' behaviour in the implementation of blended learning.

2.2 MEANING-MAKING OF THE NOTION OF BLENDED LEARNING

The understanding of blended learning can differ from individual to individual in various learning environments. The general understanding of the term "blended learning" is that the approach to education is combined with both face-to-face traditional classroom methods and online instruction (Brown, 2013; Garrison & Kanuka, 2004; Graham, 2006, 2013; Garrison & Vaughan, 2007; Dzakiria, Mustafa & Bakar, 2014; Osoria Gomez & Duart, 2012; Porter & Graham, 2016). The terms "blended learning" and "hybrid learning" are used interchangeably in the literature when referring to the notion of technology-integrated teaching and learning

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(Ferdig, Cavanaugh & Freidhoff, 2012), even though these two modes of teaching might display distinct differences. The majority of the learning in a hybrid course occurs online with a few weeks of face-to-face teaching, as opposed to blended learning where the online learning period supports face-to-face learning. For the purpose of this study, the term "blended learning" will be used and will be defined and discussed in more depth below.

The Online Learning Consortium (OLC) published a report stating that with the global change technology brought on in higher education, it has become challenging to attach only one definition to the various modes of teaching with technologies (Mayadas, Miller & Sener, 2015). Although blended learning has become of significant interest in higher education, this term too has been interpreted in more than one way (Graham, 2013), which makes it challenging to determine which definition gives the best description of what blended learning entails. There is some debate in the literature regarding the different aspects that constitute a blended mode of delivery. Some disagreements refer to the ratio of face-to-face and online learning. These discussions specifically focus on whether sections of learning should be blended, whether the pedagogical quality should be addressed in the definition, the amount of online learning that is required to call it a blended learning course and whether face-to-face sessions should be reduced to replace them with the online component (Graham, 2013; Picciano, 2009). Picciano's definition (2009) of blended learning suggests that a portion of face-to-face time has to be replaced by online activities. However, redesigning a traditional face-to-face course into a blended learning course will not require simply the replacement of face-to-face time with digital technologies; it requires the rethinking and redesigning of the educational environment as well as the learning experience, which seems to be lacking in this definition. It needs to be kept in mind that the online component of blended learning serves as a support to the face-to-face component (Anderson, 2012) and that the approach to learning is more important than the medium itself. Digital technologies have the potential to shape *what* is learnt by changing *how* it is learnt (Laurillard, 2012). This view suggests that the pedagogy and not the technology should be emphasised in the definition of blended learning.

Garrison and Vaughan's definition (2008) of blended learning is significant and will be referred to in this study because it emphasises the need for the redesign of the structure of and approach to teaching and learning. This definition acknowledges that the process of designing a blended learning module is one that takes careful thought in order to utilise the strengths of both face-to-face and online modes to create a learning experience for the student. It can be argued that

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careful thought behind restructuring and redesigning learning content is key to the implementation of a blended learning approach and that digital technologies should be used to support face-to-face teaching when its affordances provide an advantage for learning.

The following section deals with reasons why blended learning is advantageous in teaching and learning. The pedagogical approaches augmented by implementing a blended learning approach are presented.

2.3 RATIONALE FOR A BLENDED LEARNING APPROACH IN TEACHING AND LEARNING

Since the emergence of technologies in our daily lives and in education, digital technologies are often seen as a medium of change in teaching and learning practices in higher education (Siemens & Tittenberger, 2009). Garrison and Kanuka (2004) argue that with the possibilities that blended learning offers (discussed in 2.3.1), it can create innovative teaching and learning opportunities in higher education. Blended learning approaches have proven to facilitate deep and meaningful learning by actively involving the student in meaningful, interactive activities, i.e. moving towards education that is learning centred (Garrison & Kanuka, 2004).

Blended learning has the potential to address learning that was perhaps limiting in other teaching approaches (Bath & Bourke, 2010; Gray & Tobin, 2010). From the perspective of teaching and learning, blended learning could encourage pedagogical approaches such as active learning strategies, self-directed and adaptive learning, which have proven to engage the student in their learning (Alebaikan & Troudi, 2010; Gomez & Igado, 2008; Garrison & Kanuka, 2004), improving 21st century skills such as critical thinking (Poon, 2012; Reiss & Steffens, 2010), collaboration (Márquez & Jiménez-Rodrigo, 2014) and communication (Yucel & Usluel, 2016).

An extensive body of knowledge exists indicating the advantages of implementing a blended learning approach in teaching and learning. A critical perspective about blended learning is provided in this chapter. The following section covers the advantages and potential of blended learning in education and later in this chapter the challenges blended learning holds for students, teachers and institutions are discussed.

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2.3.1 Pedagogical approaches associated with blended learning

The focus of teaching and learning in the 21st century is increasingly on student engagement in the learning process where teaching is moving away from an instruction paradigm to a learning paradigm, giving the student the responsibility to learn and co-construct knowledge (Barr & Tagg, 1995). Pedagogical approaches associated with blended learning can be utilised to enhance student engagement, making use of active learning strategies (Prince, 2004), self-directed learning (Lajoie & Gube, 2018), adaptive learning (Kellman, 2013; De Kock, 2016) and authentic learning strategies (Herrington, Reeves & Oliver, 2014). These different ways of learning are essential in the 21st century to prepare students for today's workforce.

Active learning is an umbrella term focusing on student activity and student engagement in the learning process (Prince, 2004) which could be implemented through teaching and learning strategies such as case- and problem-based learning (George, Dreibelbis & Aumiller, 2013; Roehl, Reddy & Shannon, 2013). In the latter learning strategies, a problem is presented within a realistic context, which requires students to progress beyond acquiring factual knowledge. The process of solving the problem or case requires interaction and communication, which builds transferable skills based on collaboration. Several studies have reported on utilising digital technologies to present authentic cases in the form of videos or podcasts on the LMS, which students have to solve collaboratively (Back, Haberstroh, Antolic, Sostmann, Schmidmaier & Hoff, 2014; Hu, Zhang, Song, Wu, Yang, Shi, Zhang & Chen, 2019), making use of shared documents, wikis or discussion forums. In addition, solving complex problems in groups through problem-based learning develops understanding, engagement, interactivity and agency (Michaelson & Sweet 2008). Rowe (2013) refers specifically to the clinical learning environment and reports on the effectiveness of creating online collaborative environments with the use of blogs and wikis to encourage collaboration among peers. He argues that online collaboration could address complexities such as clinical reasoning and critical reflective thinking. Tan, Ladyshewsky and Gardner (2010) report on similar strategies and add that peer feedback on blogs can further assist in thinking critically. Additional to collaboration, reflective practice helps the student to think critically about their reasoning. Murphy (2004) reports on the use of reflection to promote clinical reasoning and its positive effect on the learning outcomes. The process of learning can be seen as central in a blended learning approach and guided by learning outcomes.

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Another learning approach that could be associated with the integration of learning technologies is the flipped classroom approach. In this approach the conventional lecture structure is reversed, and the aim is to increase active learning (Bergmann & Sams, 2012). Motivating students to be more actively involved in the learning process and taking more responsibility for their own learning shifts the classroom to a learning-centred environment. Thus, being actively involved in the learning process, exploring and constructing knowledge individually or in groups has proven to develop critical thinking, problem-solving skills, communication skills and self-directed learning (Voogt & Pelgrum, 2005). From a pedagogical perspective, it makes sense to implement blended learning for student engagement; however, it needs to be kept in mind that students come from very different educational backgrounds (Jones & Bridges, 2016; Lotrecchiano, McDonald, Lyons, Long & Zajicek-Farber, 2013). Many students might find it challenging to actively engage with materials because they come from educational systems where they were exposed to passive learning strategies (Johnson, Aragon, Shaik & Palma-Rivas, 2000).

Similar to active learning strategies, adaptive learning is an approach that suggests that the student becomes the centre of the learning process. An adaptive approach uses what is already known about the student employing their interaction with online content (algorithms) to analyse student performance (Kellman, 2013; De Kock, 2016; Norman & Furnes, 2016). Students have different strengths and weaknesses with levels of understanding of content (Kellman & Krasne, 2018), which could allow for gaps in understanding if assessments take place only at the end of the learning process instead of continuously. In implementing adaptive learning with the use of digital technologies, a personalised learning environment is created where students can study at their own pace in their own learning environment (Matwin & Mielniczuk, 2016; Segedy & Biswas, 2015). Immediate feedback gives a detailed description of the students' learning where they are redirected according to their answers until outcomes are mastered (Park & Il-Hyun, 2017; Harrati, Bouchrika, Tari & Ladjailia, 2016). Using technology only for the transfer of information can have limited effectiveness (Mount, Zakrajsek, Huffman, Deffenbache, Gallagher, Skinker, Rivard, Benson, Dancel & Buckman, 2015; Hoonpongsimanont Kulkarni, Tomas-Domingo, Anderson, McCormack, Tu, Chakravarthy & Lotfipour, 2016). However, if adaptive learning is implemented by increasing the complexity of learning as the student is ready, students are responded to as individuals in making personalised learning possible (Crowley, Legowski, Medvedeva, Tseytlin, Roh & Jukic, 2007; Fontaine, Cossette, Maheu-Cadotte, Mailhot, Deschenes & Mathieu-Dupuis, 2017).

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Self-regulated learning is another approach to learning that is enhanced by implementing a blended learning approach, giving students more responsibility to actively manage their own learning (Lajoie & Gube, 2018). It indicates that students intentionally participate in complex learning activities, setting goals and strategies to monitor, regulate and evaluate their progress. Implementing learning technologies can potentially improve self-regulated learning skills. This approach enables students to develop independence, professional autonomy, responsibility and motivation (Lajoie & Gube, 2018). In addition, they demonstrate perseverance and the ability to take the initiative (Zimmerman, 2002). There are some challenges students can experience in this approach to learning which will be discussed later in this chapter.

Blended learning can create authentic learning environments where students can explore, discuss and construct concepts that involve real-world problems (Herrington et al., 2014). The notion of authentic learning has been a reality since the early 1900s when Dewey (1938) referred to "learning by doing". More recently, Newmann, Marks and Gamoran (1996) referred to authentic pedagogy. Authentic learning is a pedagogical approach placing the student in real-world situations. Lately digital technologies and online platforms have been used successfully to create authentic learning experiences (Herrington et al., 2014; Rowe, 2013). When designing authentic tasks, the characteristics of authentic learning must be considered, such as the real-world relevance of the activity, students' collaboration, reflecting on one's own learning both individually and with peers, teachers' facilitation and receiving meaningful feedback (Reeves, Herrington & Oliver, 2002). These activities can be facilitated by digital technologies such as Google Drive, OneDrive or Dropbox for collaboration and ePortfolios for reflection. Authentic learning experiences allow students to explore, discuss and construct their own knowledge through situations that are relevant in their context and immediate environment. It also encourages students to think and behave as practising members of the community (Herrington & Oliver, 2000).

Finally, the importance of reflective practice in higher education has been highlighted since the publication of Schon's seminal work on reflection (1983). He reports on the transformative and empowering nature of being reflective by means of keeping a learning journal. He argues that in order to identify learning needs and have a deep and meaningful understanding of one's own learning, reflection should include critically thinking about one's experiences and practice. In more recent literature, teachers in higher education have reported on exploring this notion, and activities that promote reflection are incorporated in teaching and learning (Marrison &

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Marrison, 2009). Since the emergence of digital technologies, reflection has moved online, making use of digital-supported communication and collaboration tools such as ePortfolios, Google Docs and blogs (Rowe, 2013). Reflective practice is a strategy to engage students in metacognition, i.e. students' thinking about their learning and their personal growth and development. This notion is seen as critical in the process of reasoning and decision-making (Tan et al., 2010).

Different pedagogical approaches associated with blended learning are evident in the literature. In order to benefit from what blended learning can offer, clear guidance and structure are needed in the process of blended learning implementation.

2.3.2 The technology integration process

The implementation of innovations and emerging technologies in teaching and learning can be quite daunting. Rethinking teaching with technologies might require different skills at different stages in the implementation process. Literature provides guidelines and frameworks in an attempt to assist teachers in this process. Taking into account that there are many different approaches to the integration of emerging technologies in learning and teaching practices, and that one size does not fit all as blended learning is context dependent (Rowe, 2013), I discuss the TPACK framework (Mishra & Koehler, 2006) to uncover the different knowledge domains associated with blended learning implementation, and the SPICES model (Harden, Sowden & Dunn, 1984) for insight into blended learning curriculum development. The SPICES model gives insight into curriculum development specific to HPE (Harden et al., 1984).

Effective teaching with digital technologies requires teachers to further develop specific knowledge domains. Mishra and Koehler (2006) refer to these domains as TPACK, which includes content knowledge, pedagogical knowledge and technology knowledge. The TPACK framework builds on Shulman's theory of pedagogical content knowledge (PCK) (1986) in which the importance of content knowledge and pedagogical knowledge is highlighted. Mishra and Koehler later expanded on this framework, arguing that with the implementation of digital technologies, technological knowledge needs to be added to the domains of knowledge. These three core components of knowledge (content, pedagogy and technology) form the foundation for effective teaching with digital technologies. TPACK is therefore a structure that indicates to teachers what they need to know when integrating digital technologies in their teaching practices (Archambault & Crippen, 2009). The relationship between the domains of knowledge

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refer to pedagogical content knowledge (PCK), technological content knowledge (TCK) and technological pedagogical knowledge (TPK), which resulted in technological pedagogical content knowledge (TPACK) (Mishra & Koehler, 2006; Niess, 2005):

- Pedagogical content knowledge (PCK): Shulman's PCK model highlights the importance of content knowledge and pedagogical knowledge. Content knowledge refers to subject area knowledge, and pedagogical knowledge includes knowledge of teaching methods and strategies. PCK refers to the basic characteristics that teachers need to have in terms of the curriculum, assessments and pedagogy and how to select the appropriate methods and teaching strategies (Mishra & Koehler, 2005).
- Technological content knowledge (TCK): With the implementation of digital technologies in teaching and learning, it is vital to have knowledge of the content of the specific subject matter in order to select appropriate digital tools and approaches. Additionally, an understanding of the impact that digital technologies can have on teaching and learning is critical. The type of technological tool selected could advance teaching in new ways of facilitating knowledge and add flexibility to teaching methods. In essence, TCK refers to the relationship between disciplinary knowledge and digital technology and how digital technologies could limit or advance teaching approaches (Schmidt, Baran, Thompson, Mishra, Koehler & Shin, 2009). For the successful implementation of blended learning, teachers need to understand more than just their subject content; they need to have an understanding of how digital technologies can be best suited to address specific learning outcomes (Koehler & Mishra, 2009) and that the outcomes guide the choice of digital technologies and approaches (Laurillard, 2012).
- Technological pedagogical knowledge (TPK): TPK reflects how teaching and learning can change with the implementation of digital technologies (Graham, Burgoyne, Cantrell, Smith, St. Clair & Harris, 2009; Koh, Chai & Tsai, 2013). Knowledge of the pedagogical affordances and constraints of digital technological tools in the respective contexts is vital in order to know how tools can be used differently in the different learning contexts (Mishra & Koehler, 2006). Matthew, Koehler, Mishra and Cain (2013) provide the example of software programs that are not originally designed for teaching purposes, such as Microsoft Office Suite which is increasingly used for online collaboration. Technologies such as blogs, wikis and podcasts are designed for social networking, but are frequently used for pedagogical purposes. Teachers need to be open-

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minded and creative when seeking to implement digital technologies (Matthew et al., 2013).

- Technological pedagogical content knowledge (TPACK): TPACK refers to the true understanding that is developed when interacting with content, pedagogy and technology simultaneously (Schmidt et al., 2009). Teachers are required to know how difficult concepts can be facilitated with digital technologies and how learning can be made easier for the student. Furthermore, they need to know how pedagogical techniques can be facilitated with digital technologies, how to address problems students face and how to build on students' existing knowledge (Archambault & Crippen, 2009).

Finally, TPACK addresses the context in which teaching and learning with digital technologies takes place (Akarasriworn & Ku, 2010; Mishra & Koehler, 2006). It emphasises the uniqueness of each teaching situation and that there is no one-size-fits-all technological solution that applies in the different learning environments and teachers' different teaching approaches (Mishra & Koehler, 2006).

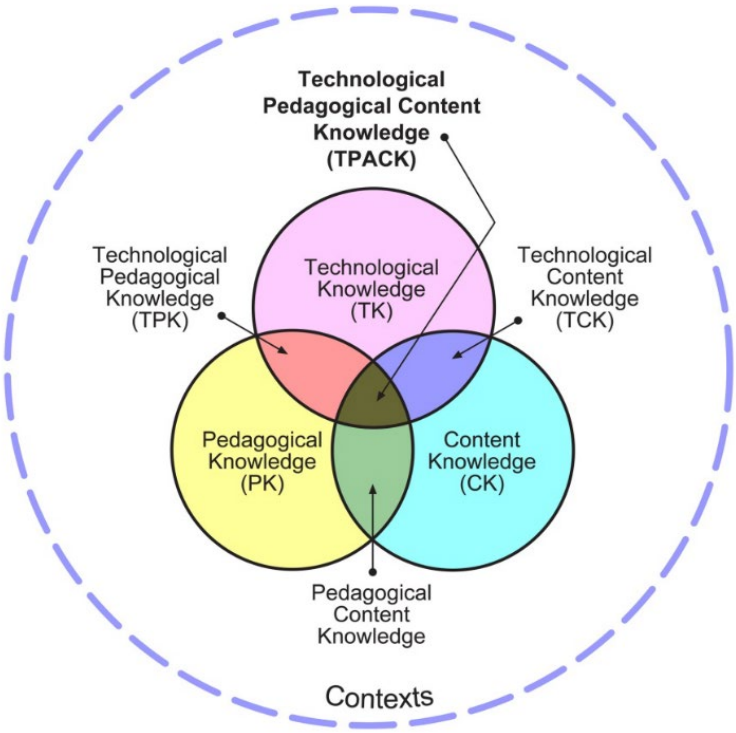

Figure 2.1: The TPACK framework (Mishra & Koehler, 2006)

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The TPACK framework suggests that in order to implement technologies successfully in teaching and learning, knowledge of technology (technological equipment, computers, internet), pedagogy (teaching methods, strategies) and content (subject area knowledge) is essential as well as the relationship between these domains (Mishra & Koehler, 2006). However, there is also a need to understand how this knowledge can be applied in blended learning curriculum development.

Harden et al. (1984) suggest that a strategy is needed in curriculum development, and the SPICES model can be used in planning the curriculum and providing guidance related to teaching, learning and assessment methods. The SPICES model was developed in the field of medical education in an attempt to give teachers a better understanding of curricular strategies and to provide them with a framework to assist in rethinking the curriculum. This model has been used in rethinking modules in order to implement a blended learning approach (Rowe, 2013).

The SPICES model suggests possible solutions to problems that were found in developing the curriculum (refer to Figure 2.2) and could guide teaching methods and assessments. The approaches on the left of the model indicate innovative approaches (SPICES), and on the right more traditional teaching strategies. The innovative approaches are briefly discussed below as Harden et al. (1984) describe the SPICES model:

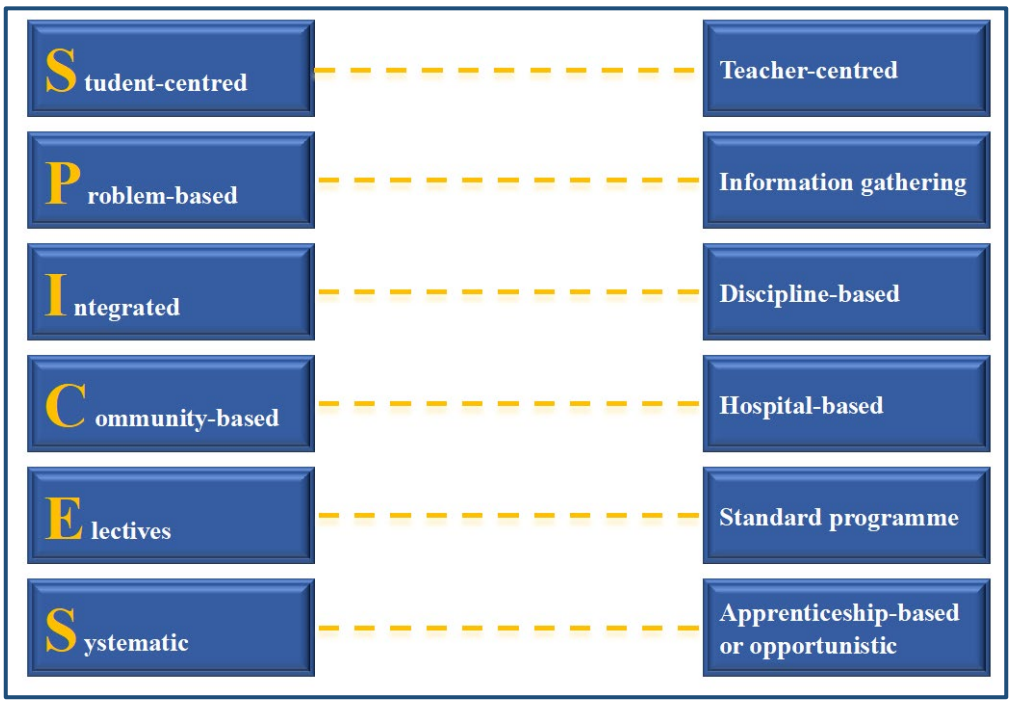

Figure 2.2: Curriculum strategies (Harden et al., 1984)

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- Student-centred: A student-centred approach gives the students more responsibility for their learning. The focus is on students' learning as opposed to the content that is being taught (Harden et al., 1984).
- Problem-based learning: This approach develops problem-solving skills. It allows students to identify the problem, acknowledge their own lack of knowledge, ask questions, search for information that could assist them in their own questions and develop answers (Harden et al., 1984).
- Integrated teaching: In acknowledging that subjects are integrated and related to each other, students are encouraged to view different perspectives from different professions (Harden et al., 1984).
- Community-based: Instead of only doing clinical work in the hospital. It has been suggested that students should do more clinical work in the community in order to broaden their view of medical needs and problems (Harden et al., 1984).
- Electives: Giving the student the flexibility to select a subject indicates self-identified needs and gives the student increased responsibility for their own learning (Harden et al., 1984).
- Systematic: Moving towards a systematic approach allows students to experience a variety of health problems, leaving little opportunity for gaps in learning to occur (Harden et al., 1984).

In order to facilitate changing and adapting innovative approaches to learning, there is a need for a paradigm shift from a conventional way of teacher-centred to more interactive student engagement.

2.4 A PARADIGM SHIFT IN TEACHING

The 21st century places demands on HEIs to adapt teaching and learning practices to accommodate students' different learning needs (Bath & Bourke, 2010; Gounari & Koutropoulos, 2013) and actively engage the student in their learning process. This requires teachers to think differently about teaching and learning (Gardner, 2008; Kereluik et al., 2014). Innovative approaches to teaching and learning practices might call for a paradigm shift as teachers need to deliberately redesign their teaching while keeping in mind that the student is the centre of the learning process (Garrison & Kanuka, 2004). A paradigm shift is not a new

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concept in education; literature has referred to this notion since the early 1900s with John Dewey's argument that educational decisions should be based on a learner-centred approach. This notion has evolved since and in more recent literature students are seen as active discoverers and constructors of knowledge in which the teacher is the facilitator of learning (Barr & Tagg, 1995). Barr and Tagg (1995) argue that the passive lecture format is contradictory to principles for effective student learning and that a shift is needed from teaching productivity to learning productivity. The purpose of the learning paradigm is not to transfer knowledge, but to prompt learning and create a learning environment where students construct knowledge in collaboration with their peers, becoming the co-producers of learning, making discoveries and solving problems (Barr & Tagg, 1995).

In the context of SU, the approach to teaching and learning promotes a learning-centred approach and encourages teachers to be facilitators of learning (Stellenbosch University, 2018) where students are actively engaged in the learning process, becoming co-creators of knowledge. Blended learning activities have the potential to actively engage students by moving learning from knowledge delivery to knowledge discovery (Garrison & Kanuka, 2004). The implementation of a blended learning approach requires a shift from being a teacher in a conventional teaching environment to becoming a facilitator of self-directed learners.

The ever-changing field of learning technologies in higher education requires teachers to be aware of pedagogical changes in teaching and learning (Garrison & Kanuka, 2004; Reilly, Gallagher-Lepak & Killion, 2012). Thus, teachers have to commit to lifelong learning (Ding, Babenko, Koppula, Oswald, White & Bao, 2019). Hojat, Veloski and Gonnella (2009:1066) define lifelong learning as "… self-initiated activities and information-seeking skills that are activated in individuals with a sustained motivation to learn and the ability to recognize their own learning needs". It seems that lifelong learning in HPE is becoming essential to manage the complexity of medical information and the challenges teachers are experiencing in terms of emerging technologies in order to stay current in their field (Ding et al., 2019).

To further explore blended learning implementation, it is necessary to take a closer look at who the clinician teacher is, as referred to in this study. This study was done in the context of a medical curriculum and therefore the term "clinician teacher" refers to the doctor that teaches the students.

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2.5 THE CLINICIAN AS A TEACHER

The doctor-teacher role in the context of HPE, or medical education as it is often referred to, is indeed interwoven. Some clinician teachers identify primarily as doctors, some take a middle ground and others see themselves as teachers (Higgs, Richardson & Dahlgren, 2004). The typical teacher in the HPE context takes on multiple professional roles, which include being a clinician/practitioner, a teacher and a researcher (Higgs et al., 2004; Harden & Lilley, 2018), including additional duties such as keeping up with faculty development and being a role model and facilitator. The adoption of the role of teacher is essential for quality clinical learning, but the transition from doctor to teacher could be a difficult task (Riveros-Perez & Rodriguez-Diaz, 2017), as most teachers are not primarily trained to teach (Swanwick & McKimm, 2010). Some teachers do attend educational courses, but most do not and have to adjust and learn teaching skills on their own (Riveros-Perez & Rodriguez-Diaz, 2017).

Another challenge that clinician teachers might experience is juggling between classroom teaching (theory) and workplace-based teaching (practical) in the clinical area involving the presence of patients (Riveros-Perez & Rodriguez-Diaz, 2017). 21st century learning adds additional pressure on the teacher to adapt to alternative teaching and learning methodologies. Teachers are in a world where the learning environment is ever-changing and where digital technologies receive more prominence in teaching and learning. Increased pressure is put on HEIs to adapt accordingly (Steel & Hudson, 2010), requiring teachers to identify areas where they need to develop in terms of knowledge and skills.

Clinician teachers have to be reflective in their own practice. They constantly have to be aware of areas they need to develop. The SU teaching and learning policy encourages reflective teachers to think critically about their teaching practice (Stellenbosch University, 2018) in progressing towards becoming a leading teaching scholar. These requirements have to be met by means of professional development. The literature refers to different concepts of development including professional development (Griffin, 1983; Schönwetter, Hamilton & Sawatzky, 2015), faculty development (Steinert, 2014; Steinert, Mann, Anderson, Barnett, Centeno, Naismith, Prideaux, Spencer, Tullo, Viggiano, Ward & Dolmans, 2016) and staff development (Owens, 2012). While the focus of this study is not development per se, it is important to state that in this study professional development refers to the individuals' ability to develop and learn and to motivate themselves to improve their knowledge and skills. Griffin (1983) refers to professional development as the effort to bring about change by means of

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teachers' own attitudes and beliefs regarding teaching and learning. Faculty development again points to the opportunities within the institution to develop knowledge, skills and behaviour in the form of various workshops or courses (Steinert, 2014).

According to Reilly et al. (2012), teachers in higher education are often not well prepared to adopt new instructional and pedagogical strategies to teach with technologies, and therefore the need for faculty development and to demonstrate the integration of learning technologies in teaching and learning practices has been recognised (Reilly et al., 2012). Without the knowledge of technology and the pedagogical design, teachers may not have the ability to respond appropriately to all alternative learning and teaching demands associated with 21st century learning.

2.6 FACULTY DEVELOPMENT OFFERINGS

Over the past few years, faculty development has increasingly assisted in the development of new trends in teaching and learning. Most educational institutions offer courses and programmes to improve knowledge, skills and behaviour (Steinert, 2014) in both individual and group settings. The role of faculty development has been emphasised in literature to assist in implementing a blended learning approach (Fetters & Duby, 2011; Owens, 2012; Garrison & Vaughan, 2013).

Faculty development is traditionally known to entail formal one-time programmes (Steinert, Mann, Centeno, Dolmans, Spences, Gelula & Prideaux, 2006), but it has been suggested that it should in fact be a longitudinal process. Longitudinal faculty development programmes are associated with more sustained outcomes (Steinert et al., 2016). Faculty development programmes could also take on an informal approach, placing the teacher in authentic environments (Webster-Wright, 2009). Teachers develop not only through formal workshops, but through experience, observation, online learning and workplace learning (Steinert, 2010) which could take place individually or in groups.

An awareness of the needs of the teachers is essential in order to develop relevant faculty development programmes (Schönwetter et al., 2015). The literature reveals that teaching with digital technologies is one of the most common needs (Hendricson, Anderson, Andrieu, Chadwick, Cole, George … et al., 2007; McGaghie, 2010). Additionally, Steinert et al. (2016) found in their systematic review that in order to meet these needs, several key features within

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faculty development programmes can enhance teaching effectiveness. These features include (1) using experiential learning which creates opportunities to practise and apply what teachers have learnt, (2) effective relationships between colleagues which might have to be intentional in building a community with the same teaching and learning interests, (3) opportunities for feedback and reflection and (4) authentic environments that expose the teacher to a blended learning experience. Principles of authentic practice-based learning (Herrington & Oliver, 2000; Yardley, Teunissen & Dornan, 2012) place the teacher in the shoes of the student to experience what they experience, which could result in opportunities for learning and professional development.

SU values the professionalisation of teachers and therefore multiple faculty development opportunities are available to support ongoing development (Stellenbosch University, 2018). The institutional documents that are available to guide and assist lecturers are the SU teaching and learning policy (Stellenbosch University, 2018) as well as the Designing Learning, Teaching and Assessment (DeLTA) framework (Designing Learning, Teaching and Assessment (DeLTA) process, 2013) as conceptualised by the SU Centre for Teaching and Learning. The DeLTA framework has been developed to assist teachers in designing a curriculum that engages students in their learning (DeLTA process, 2013). This cyclical process offers teachers a guiding framework to develop engaging learning activities, authentic teaching approaches and assessments.

There are numerous courses available between the Stellenbosch campus and the FMHS. For example, there are formal accredited opportunities such as the MPhil in HPE, as well as more informal non-accredited courses such as the Professional Educational Development of Academics (PREDAC) to orientate new SU staff, a blended learning short course and then various HPE-focused short courses. A supportive teaching climate is evident for these faculty development opportunities (Stellenbosch University, 2018).

Faculty development is essential in developing knowledge and skills regarding the pedagogy of blended learning and also digital literacy. In order to design learning opportunities that are learning-centred and promote learning, it is crucial to understand the medical student and their learning preferences.

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2.7 THE MEDICAL STUDENT

Each generation is shaped by different situations influencing how students think, how they respond to situations, their preferences and habits (Hopkins, Hampton, Abbott, Buery-Joyner, Craig, Dalrymple, Forstein, Graziano, McKenzie, Pradham & Wolf, 2018). With the emergence of technology in the past few decades, students are interconnected and seek education that is convenient, personalised and relevant (Mahan & Clinchot, 2014). With the plethora of information that is available, they live in an environment of choice, which influences their need to self-direct their learning and discover information. On the other hand, the literature decries 21st century students as expecting information that is readily available. These preferences could easily be misunderstood by teachers (Hopkins et al., 2018), and these students could be perceived as rude or lazy.

Teachers often make the assumption that students are immersed in technology and that they are all at similar levels of digital literacy due to the era in which they live. However, not all students have the same level of proficiency to learn with digital technologies (Draffan & Rainger, 2006). Teachers often assume that students are prepared to be taught with the assistance of learning technologies, which is not always the case and could disadvantage students if they have not yet been exposed to learning technologies (Jones & Bridges, 2016; Lotrecchiano et al., 2013). Technology readiness and digital literacy contribute to students' experience of technology strategies in teaching and learning (Ratliff, 2009).

Implementing a new teaching approach goes beyond only the teacher – it influences the student as well. Not only do students have to adapt to the new mode of learning on an online platform, but they are also required to have certain skills in order to participate successfully in blended learning activities. Skills include time management skills (Kenney & Newcombe, 2011; Alebaikan & Troudi, 2010; Heaney & Walker, 2012), metacognitive skills and self-regulatory skills, all of which can influence the students' learning experience (Xu & Jaggars, 2013). Students with low self-regulatory skills find it more challenging to cope than others in the absence of the teacher in the online component of blended learning and might need frequent direction and reinforcement (Dabbagh & Kitsantas, 2005; Marino, 2000).

Students' level of preparedness to be self-directed learners is often referred to as a barrier in learning technologies and needs to be considered when implementing a blended learning approach (Xu & Jaggars, 2013; Hao, 2016). Hao (2016) found that first-year students' level of

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technology readiness was much lower than that of senior students. It was also suggested that students feel more comfortable with technologies as they progress in their studies and are gradually introduced to the online environment as they become more familiar with the context (Hao, 2016). The complexity of learning technologies might add to students' frustration, anxiety and overwhelmed feeling to participate in a blended learning approach (Draffan et al., 2006). In addition, students can be disadvantaged due to resource limitations, including insufficient access to the internet and a lack of high-capacity broadband in rural areas where equal access to technologies cannot be guaranteed (Cronje, 2018; Jones & Bridges, 2016). SU prides itself on making technology infrastructure available and providing learning opportunities that specifically support students to use digital technologies for effective learning (Stellenbosch University, 2018).

A better understanding of who the student is and how teachers respond to the learning needs of students could potentially aid in better understanding the behaviour of teachers. Referring to clinician teachers' multiple responsibilities, it is essential to try and understand why the emerging technologies that are available for teaching and learning are not utilised more extensively. Current literature has identified several factors that influence the integration of a blended learning approach in teaching and learning (Buabeng-Andoh, 2012) and this can be built on by exploring clinician teachers' behaviour in the integration of blended learning in their teaching practices. Bandura's triadic reciprocal model (1986) on which social cognitive theory is based is therefore reviewed.

2.8 THEORETICAL PERSPECTIVES ASSOCIATED WITH HUMAN BEHAVIOUR

Since the mid-1970s, the level of adoption of digital technologies has been a concern in which research was initiated to investigate users' individual and behavioural factors in the adoption process (Lucas, 1975, 1978). Theories such as the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975) were drawn on, which initiated one of the most well-known theories in technology adoption, namely the technology acceptance model (TAM) (Davis, Bagozzi & Warshaw, 1989), which will be discussed later in this chapter. In the early 1990s, researchers started using social cognitive theory (SCT) (Bandura, 1986) when they realised the importance and relevance of self-efficacy in the adoption of digital technologies (Carillo, 2010). Self-efficacy is a central notion in SCT and led to numerous insights into teachers' behaviour

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regarding the use of computers, the internet and learning technologies (Hayashi, Chen, Ryan & Wu, 2004; Compeau & Higgins, 1995; Pearson & Pearson, 2008). Marakas and Johnson (1998:126) warn that there is a "general lack of attention to the dynamic, multileveled, and multifaceted nature of the computer self-efficacy construct" and reinforce the importance of self-efficacy in technology adoption. Other studies that made use of SCT to understand behaviour in the uptake of learning technologies have confirmed the growing importance of the notion of self-efficacy, but identified that the focus on other essential SCT concepts has been neglected and has led to limited potential to understand individuals' behaviour (Carillo, 2010; Marakas, 1998). In order to address this criticism and to make use of the full potential of the SCT in helping to understand individuals' behaviour, the entire framework of SCT is discussed in relation to the adoption of learning technologies.

2.8.1 Social cognitive theory

SCT introduces a model that provides one with an understanding of human behaviour and has been widely accepted in research to do so (Zimmerman, 1989; Carillo, 2010; Wang & Wu, 2008). Drawing on insights from previous studies in which SCT was utilised to investigate behaviour, the significance of SCT in understanding behaviour in the implementation of digital technologies has the potential to identify internal and external influences on an individual's behaviour (Compeau, Higgins & Huff, 1999; Carillo, 2010). Individuals are shaped not only by external influences, but also by the self and their own cognition (Bandura, 2006). SCT explains that agents (i.e. individuals) do not operate autonomously and that behaviour is not entirely determined by situational influences, but rather that it is a triadic reciprocal process, relying on the assumption that behaviour, cognition and personal factors, and environmental influences act as interrelated determinants (Bandura, 1986, 1997). These factors influence each other but the influence is not necessarily of equal strength.

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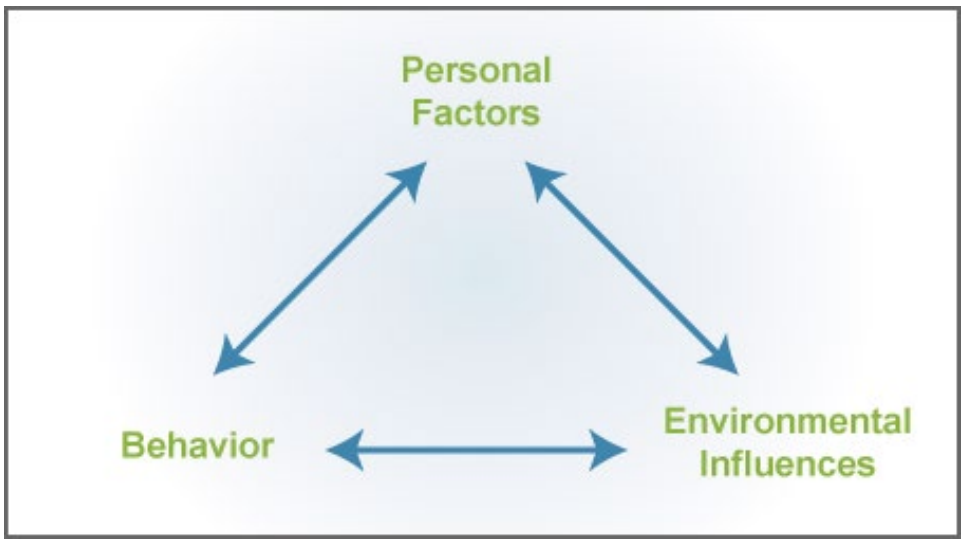

Figure 2.3: Bandura's social cognitive theory (1986)

The environment refers to social and external factors that could provide opportunities and social support that have an effect on behaviour. Environmental factors include colleagues, social norms (social pressure), institutional policies and culture, workload and context (Compeau & Higgins, 1995). The environment provides a framework to better understand behaviour (Parraga, 1990) in terms of external influences that determine behaviour.

Personal factors include any cognitive factors, such as thoughts, beliefs, intentions, attitudes, knowledge and motivational forces that can influence the individual's behaviour. The interaction between the individual and the environment indicates that individuals choose their environment, but at the same time shape their surroundings. Pajares (1996:544) affirms that "how individuals interpret the results of their performance attainments informs and alters their environments and their self-beliefs, which in turn inform and alter their subsequent performances".

Behaviour influences and is influenced by environmental and personal factors. Some of the critical behavioural factors included in Bandura's triadic reciprocal model are self-regulation, self-reflectiveness, knowledge, skills and attitude. The essence of SCT lies in the framework it gives in investigating how individuals acquire and maintain behavioural patterns and providing a basis to strategise interventions (Bandura, 1978).

Bandura (1986:18) suggests that these three factors, namely the person, the behaviour and the environment are "all inseparably entwined to create learning in an individual". Using SCT in this study means acknowledging the concept that determinants are interactive with each other,

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i.e. in order to effectively predict and understand behaviour, individual and environmental factors have to be integrated. Evaluating individuals' behaviour thus requires environmental, behavioural and personal factors to be investigated.

Focusing solely on either individual factors or technological factors raises issues when attempting to understand behaviour in the uptake of learning technologies. Therefore, there is a need to investigate other theories associated with the acceptance of technologies for a holistic understanding of teachers' behaviour towards implementing technologies in teaching and learning.

2.8.2 Theoretical perspectives related to learning technology adoption

There are a number of frameworks that could be considered to further explain individuals' adoption of digital technologies. This section will focus on the technology acceptance model (TAM) (Davis et al., 1989) and the theory of planned behaviour (TPB) (Ajzen, 1985). The commonality in these theories (TAM, TPB and SCT) will then be discussed. These three perspectives provide a theoretical foundation for understanding the individual's reactions in the integration of digital technologies in teaching and learning. While TAM and TPB focus exclusively on teachers' beliefs about digital technologies, SCT focuses on the teachers' behaviour.

TAM provides a framework that could indicate factors that influence groups to adopt new technologies and was explored to better understand teachers' relationship with digital technologies and their acceptance of technologies in teaching and learning. TAM is based on Fishbein and Ajzen's theory of reasoned action (TRA), which offers a theoretical perspective that explains human conduct and the significance of one's beliefs in order to anticipate behaviour (Ajzen & Fishbein, 1975). In order to determine behavioural intention in a new innovation, Venkatesh and Davis (2000) refer to two key belief constructs to examine: perceived usefulness (PU) and perceived ease of use (PEOU), which are the predictors of users' attitudes towards using digital technologies. Consequently, attitude depicts the intention to use digital technologies, which affects actual use.

Firstly, PU is an extrinsic form of motivation that influences satisfaction in the use of technologies (Roca & Gagne, 2008), meaning that one's motivation comes from the degree to which one believe the system will enhance work performance (Sanchez & Hueros, 2010), i.e. whether the system is useful. Davis et al. (1989) argue that PU has a significant influence on

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user intention. If a tool is seen as useful and beneficial, the user's behavioural intention would be much higher. Secondly, PEOU is the extent to which one regards technology to be free of extra effort. PEOU impacts PU, meaning that if technology is seen to be easy to use, then it is likely that it would be seen as more useful. There is a direct relationship between PU and PEOU and the individual's intention (Venkatesh & Davis, 2000), in other words, when a tool is both useful and easy to use, actual system use is more likely. Teachers need to know why, when and how to implement digital technologies in education (Krumsvik, 2014; Laurillard & Masterman, 2009; Lindberg & Olofsson, 2012), and they need to know whether it is useful and easy to use in order to be motivated to implement it.

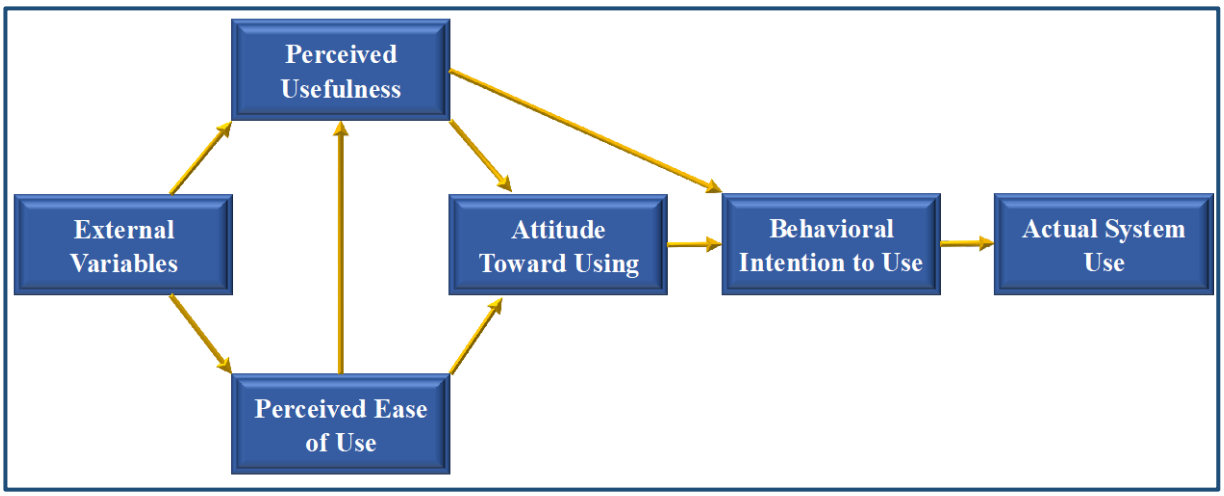

Figure 2.4: Technology acceptance model (Davis et al., 1989)

TAM is widely used to study the behaviour of teachers towards implementing a blended learning approach (Sanchez & Hueros, 2010; Holden & Rada, 2010; Alharbi & Drew, 2014) and has been found to give insight into teachers' motivation and attitude towards learning.

TPB reflects the underlying assumption that behaviour is predicted by the individual's intention, which is directly influenced by attitude, subjective norm and perceived behavioural control. The attitude (whether positive or negative) the individual has towards a behaviour, their view of whether others expect them to participate in the behaviour (subjective norm) and their belief that they have in the ability to perform the behaviour (perceived behavioural control) informs the actual behaviour of the individual. Several studies have found TPB useful in investigating individuals' cognitive, affective and behavioural reactions towards digital technologies (Compeau et al., 1999; Bolt, Killough & Koh, 2001; Hasan & Ali, 2006).

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The commonality in these three theories is that behaviour is a result of a set of beliefs about technology (Compeau et al., 1999). Beliefs are represented by TAM's PU and PEOU, by TPB's behavioural beliefs and outcome evaluations and by SCT's outcome expectations. However, the differences in the three theories is that TAM (Davis et al., 1989) focuses solely on attitude towards the implementation of technology where behaviour is seen as a set of beliefs regarding technology and attitude towards the use (Compeau et al., 1999), contrasting to TPB and SCT which include other beliefs that could influence behaviour. For instance, TPB incorporates the notion of perceived behavioural control, ability and intention as influencing behaviour. SCT has two personal-level factors, namely self-efficacy and outcome expectations, which have been investigated in previous studies and found to be insightful in understanding individuals' behaviour in computer training (Compeau et al., 1999; Compeau & Higgins, 1995). Outcome expectations refer to an individual undertaking a behaviour with the condition that it leads to valued outcomes (Compeau & Higgins, 1995). For example, motivation to implement and learn to use technologies will be much higher if the individual can see a higher level of performance when doing so. This closely relates to TAM's PU (Davis et al., 1989). Computer self-efficacy and outcome expectations have been found to play a significant role in individuals' decision to use technology (Compeau & Higgins, 1995). However, prominence is given to self-efficacy as a core property of human behaviour and will be investigated further as a determining factor of behaviour.

Self-efficacy is defined by Bandura as people's "judgment of their capabilities to organise and execute courses of action required to attain designated types of performances. It is concerned not with the skills one has but with judgments of what one can do with whatever skills one possesses" (Bandura, 1986:391). In other words, self-efficacy refers to the belief in one's own ability to perform a task or behaviour (Bandura, 1997), influencing how we think, what we believe and how we conduct ourselves. Perceived self-efficacy (capability) seems to affect one's level of motivation and how stress and anxiety are controlled (Bandura, 1997). Individuals that do not believe they can control their own stress, impair their own level of functioning. Research has shown that self-efficacy has a significant effect on teachers' use of technology in their teaching and how they approach tasks and challenges (Buabeng-Andoh, 2012). Individuals with high self-efficacy are confident and believe they can master a task, in contrast with individuals with low self-efficacy that will most likely avoid challenges. It can be argued that self-efficacy plays a key role in the behaviour of teachers in their decision whether to implement blended learning or not. Research has indicated a secure link between self-

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efficacy and individual reactions to the use of technology and the degree to which one is willing to learn from training (Compeau et al., 1999; Taylor & Todd, 1995).

A second difference between TAM, TPB and SCT is that TAM and TPB view the relationship with the environment as operating in a single direction. This is in contrast to SCT, which operates bidirectionally and acknowledges the interaction between the environment, personal factors and behaviour (Bandura, 1986). For example, individuals' previous experience with educational technologies can influence their self-efficacy and attitude to future use.

It is clear from Bandura's theory that individuals have the capacity to make their own choices and that several factors influence these choices. The next section deals with teachers' perspectives and experiences with internal and external factors that could influence behaviour whether to integrate blended learning or not. Highlighting these experiences and perspectives of blended learning supports future integration of blended and e-learning strategies (Protsiv & Atkins, 2016).

2.8.3 Interrelated factors influencing teachers' implementation of blended learning

Several factors have been identified in the literature as influencing the integration of emerging technologies in teaching and learning (Buabeng-Andoh, 2012). Bandura's triadic reciprocal model in SCT was used to situate interrelated factors that influence behaviour.

2.8.3.1 Environmental influences

The literature has identified several environmental factors, such as the workload associated with implementing a blended learning approach, institutional culture and support and faculty development, that influence teachers' behaviour towards digital technologies.

Workload and time associated with creating content and maintaining a blended learning platform is often mentioned in the literature as influencing the implementation of digital technologies in teaching and learning (Neyland, 2011; Alebaikan & Troudi, 2010; Kenney & Newcombe, 2010; Heaney & Walker, 2012; Korr Derwin, Greene, & Sokoloff, 2012; Gedik, Kiraz & Ozden, 2013). It is continuously identified as a barrier in the adoption of blended learning (Muilenberg, 2000). Time has to be spent on learning new techniques and skills, redesigning the blended module and logistics such as uploading materials and online facilitation (Levin, Whitsett & Wood, 2013). Technical maintenance of the online system could also add additional workload for the teacher (Gedik et al., 2013; Kenney & Newcombe, 2010;

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Lotrecchiano et al., 2013). Although some studies might argue that creating blended learning materials could take longer to prepare than traditional teaching, other studies argue that preparing for online teaching takes less time than typical face-to-face teaching preparation (Warner-Thomason, 2009). However, online learning requires more activities to be prepared. It seems that it gets easier to build online content when the person has more experience doing so, and only then does it require less time to prepare (Harasim, 2000). It is probably fair to say that the amount of time spent preparing the online component of blended learning is influenced considerably by the experience, knowledge and skills of the teacher.

Another environmental factor that could influence teachers' behaviour to implement a blended learning approach is institutional culture (Alebaikan & Troudi, 2010; Ramos, Taju & Canuto, 2011; Lai, 2011). Institutional culture could refer to the unique shared teaching and learning values, beliefs and behaviour of teachers and staff in an institution. The students have to adapt to new learning strategies, and teachers need to make a paradigm shift in teaching practices (Ramos et al., 2011). Institutional culture does not only refer to the buy-in of teachers and students, but also to the resistance to change within the institution and the institution's commitment to implement a blended learning approach. A mutual vision for teaching and learning within the institution is needed, which must be consistent with the broader institutional vision with regard to digital technologies in teaching and learning (Carbonell, Dailey-Hebert & Gijselaers, 2013). Aligning institutional goals and visions are crucial for the successful implementation of any new initiative. However, transformation cannot occur without supportive management, institutional culture (Lai, 2011) and a shared vision of what teaching and learning could and should look like. Garrison and Vaughan (2013) argue that the successful implementation of blended learning can be predicted by how management in an institution engages teachers.

Clear communication channels between support staff, management and teachers are an important factor to implement a blended learning approach. Doherty et al. (2018) report that poor communication channels between support systems and a supportive management team can influence teachers' attitude towards implementing digital technologies. They also refer to technology-augmented teaching as a process that has to be adopted in polarisation (Doherty et al., 2018), i.e. an interdepartmental process which includes communication and collaboration between teachers, support staff and management in the process of blended learning implementation. The importance of the collaboration of these role players is highlighted by

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Garrison and Vaughan (2008) for the effective implementation of a blended learning approach. Bediang, Stoll, Geissbuhler, Klohn, Stuckelberger and Nko'o (2013) confirm that collaboration and communication among qualified, dedicated management, teaching staff and support staff are crucial in all departments in the institution to ensure cohesive education and the successful adoption and implementation of a new approach. Lock and Johnson (2017) emphasise the importance of knowing who the role players are in the transition to a blended learning approach as well as the support structures that are in place. Their study reported on factors influencing the transition, which includes clear communication between teaching staff, academic staff and support staff. Based on the findings, it could be argued that clear communication channels can result in participants feeling more supported by the institution.

Faculty development is often referred to as a key factor in the implementation of new technologies in teaching and learning (Ramos et al., 2011). Faculty development is seen as an environmental factor in Bandura's triadic reciprocal process and its availability can influence an individual's decision to implement blended learning (Buabeng-Andoh, 2012). Therefore, institutions should make faculty development and training available to assist in the process of innovation. Faculty development includes developing teaching conceptions and professional teaching skills with planned activities to improve knowledge, attitudes and skills that are essential to perform the teachers' task (Reilly et al., 2012). The relationship and influence between the environment and the person are evident in the sense that faculty development programmes have an influence on teachers' attitude towards digital technologies. A lack of knowledge and skills is a frequently seen personal factor in the attempt to implement a blended learning approach, and faculty development appears to be part of the solution to the problem. Teachers might lack the skills to participate in the online component of blended learning and might find it daunting to develop these skills (McGovern & Gray, 2005). Maguire (2005:4) states that "when faculty members feel institutional support, their levels of motivation and dedication are increased". Therefore, faculty development programmes should address teachers' pedagogical beliefs and conceptions of teaching and learning (Reilley, Gallagher-Lepak & Killion, 2012).

2.8.3.2 Personal factors

Several examples in the literature indicate how personal factors influence teachers' behaviour towards learning technologies. Factors such as beliefs, attitudes and motivation can be included.

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Cormier and Siemens (2010) argue that the purpose of teaching needs to be evaluated and whether teachers carefully control students' access to knowledge or whether teachers find value in interaction and engagement in teaching and learning, which in essence refers to teachers' belief about their teaching approach. There has been growing interest in teachers' pedagogical beliefs, how teachers plan their teaching and learning activities (Kitsantas & Baylor, 2001; Hallet, 2010; De Vries, Van de Grift & Jansen, 2013) and their beliefs about teaching with digital technologies in higher education (Fluck & Dowden, 2013; Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur & Sendurur, 2012; Kim, Kim, Lee, Spector & DeMeester, 2013). Pedagogical beliefs refer to beliefs about teaching and learning and seems to be influenced by factors such as teaching experience, teaching role models and teaching context (Mihaela & Alina-Oana, 2015). Mihaela and Alina-Oana (2015) confirm that pedagogical beliefs affect teachers in their planning and developing of teaching activities. Wang, Lui, Chou, Chan and Yang (2004) and Ertmer (2005) report on the integration of digital technologies in teaching and learning and the resistance that is associated with teachers' pedagogical beliefs. Ertmer argues that the persistent beliefs of teachers' traditional practice is what deters the integration of technology. It might be argued that teachers' personal opinion and pedagogical beliefs regarding the value of teaching with technologies is a personal factor that could influence their decision to implement blended learning (Ajzen & Madden, 1986; Pajares, 1992). Teachers' beliefs about how students learn seem to guide their teaching approach. This notion could be based on earlier research that confirmed that teachers' pedagogical beliefs exert subtle influences in their teaching practices (Kagan, 1992).

Teachers' beliefs can be associated with where they place themselves and their role as teacher in the learning environment. Barr and Tagg (1995) refer to a passive lecture-discussion format of teaching as an instruction paradigm rather than a learning paradigm that is shifting the teacher to being a facilitator of learning. Some teachers might believe that their traditional way of transmitting knowledge to students is still the best (Owens, 2012). These pedagogical beliefs can determine whether teachers will implement technologies or not (Judson, 2006; Owens, 2012). A number of authors have reported on the relationship between belief regarding the usefulness of technologies and how they approach their teaching practices (Hampton, 1994; Pajares, 1992; Kim et al., 2013). Kim et al. (2013) investigated the relationship between teachers' beliefs and their digital technology integration and found that teachers' beliefs are strongly connected to their teaching practices. Their study also investigated teachers' beliefs about effective ways of teaching, including the teachers' opinion about class discussions, their

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belief of their role as teacher and the learning process. The relationship between pedagogical approaches to teaching and learning and teachers' choice to implement digital technologies is closely related to pedagogical beliefs. Kim et al. (2013) suggest that pedagogical beliefs ought to be considered in the facilitation of technology integration. Other studies confirm that a barrier to implement learning technologies is the existing attitudes and beliefs towards digital technologies in teaching and learning (Richards, Gallo & Renandya, 2001). In their study, Richards et al. (2001) examined the beliefs of teachers who were technology users and found that they were in favour of using technologies that were closely aligned with how they believed teaching would be enhanced. To give an example, they found that teachers who believed that technologies can best be used for collaboration among students described how they developed projects where students collaborated synchronously and asynchronously. Therefore, it could be argued that belief regarding the usefulness of technologies could lead to change and ultimately the actual use of digital technologies in teaching and learning. The literature suggests that a change in pedagogical beliefs is needed for a real change in teaching practice (Reilly et al., 2012; Pajares, 1992; Wilkins, 2008). Understanding teachers' pedagogical beliefs could assist in faculty development programmes for focused training.

Motivation seems to be a common personal factor influencing teachers' behaviour in implementing a blended learning approach. The success of the implementation of blended learning depends to a certain extent on the motivation of teachers to teach with technologies and to adapt to a new way of teaching (Hamila & Embi, 2016). Understanding motivation could indicate personal factors that have an influence on behaviour. For example, in a study done by Cullen and Greene (2011), attitude was found to be a significant predictor of the motivation to implement digital technologies in teaching and learning. They add that teachers must feel competent (self-efficient) in order to be motivated to use technology. These two factors are consistent with self-determination theory (Deci & Ryan, 2000), which proposes that in order to experience intrinsic motivation (behaviour driven by the self knowing there is no reward) and a more self-determined extrinsic motivation (reward-driven behaviour), three basic needs have to be met. These three psychological needs are the need for relatedness (desire to feel connected/included), competence (desire to feel effective/valued) and autonomy (desire to self-initiate and self-regulate personal behaviour) (Roca & Gagne, 2008). Motivation in self-determination theory refers to why one acts on specific activities. Intrinsic motivation, also called autonomous motivation (Deci & Gagne, 2005), is driven by real enjoyment, interest and a feeling of accomplishment and gratification. This type of motivation is self-determined.

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Protsiv and Atkins (2016) gave an example of some teachers' strong intrinsic motivation to meet students' different learning style needs, which seems to disregard the added workload in creating blended learning materials. Change in a teaching approach depends on what the teacher's motivation is. Irrespective of the constraints there might be to implement change in learning, teachers' intrinsic motivation leads to meeting students' different learning style needs and spending more time and effort in order to create a better learning experience (Protsiv & Atkins, 2016).

Another personal factor influencing the adoption of a blended learning approach could be individuals' primary identification with their role as doctors/clinicians rather than their role as teacher. Sethi, Ajjwai, McAleer and Schofield (2017) report several tensions and fears that their participants mentioned in identity formation, which might assist in understanding why clinician teachers do not identify as teachers. One such fear was the ability to balance the different identities HPE requires and losing their clinician status if they choose a teacher identity. Additionally, they report a negative bias towards education, stating that teachers are undervalued. Staying up to date with developments in HPE might be challenging if they choose a teacher identity. It has been reported that the institution has a significant influence on the teachers' identity (Lemaire, Wallace, Sargious, Bacchus, Zarnke, Ward, Ghali & William, 2017) and it is suggested that faculty development can enhance clinician teachers' identity (Cantillon, Dornan & De Grave, 2019). The clinician teacher identity is dependent on the institution's support of the role of the teacher and stronger teacher identities are developed with greater motivation to take on a teaching role. Sethi et al. (2017) found that the values and practices of the institution could develop or impede teachers' identity.

2.8.3.3 Behavioural factors

Several behavioural factors are identified in the literature as influencing teachers' digital technology acceptance in teaching and learning, such as teachers' computer self-efficacy and competence.

The computer is the main tool used in learning technologies and therefore emphasis is placed on computer self-efficacy (Celik & Yesilyurt, 2013). The literature often refers to computer self-efficacy to indicate capability and confidence to use a computer, which essentially influences the use of digital technologies in teaching and learning (Alebaikan & Troudi, 2010; Gedik et al., 2013, Lotrecchiano et al., 2013; Celik & Yesilyurt, 2013). Computer self-efficacy,

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confidence and competence are closely related. Several reasons could indicate why teachers do not have the confidence to implement digital technologies, and competence is a main factor. Competency refers not only to the ability to use digital technologies, but it could also refer to the ability to create harmony between the face-to-face and the online environment (Gedik et al., 2013; Lotrecchiano et al., 2013). Both confidence and competence are key factors in teachers' computer self-efficacy and a determinant in the implementation of technologies in teaching and learning (Carillo, 2010). Here the interrelatedness between faculty development and confidence/self-efficacy is evident. A negative attitude towards the implementation of technologies comes from teachers that lack knowledge and skills to make informed decisions (Sait, Al-Tawil, Ali & Khan, 2003). Despite the lack of knowledge and competence, another reason could be that teachers have a fear of failure (Balanskat, Blamire & Kefala, 2007). When competence is lacking, a feeling of anxiety can arise when having to use technology in front of an entire class. Bandura's research indicates that high-perceived self-efficacy leads to setting higher goals and a better likelihood of achieving goals. Teachers' belief in their own self-efficacy contributes to self-regulation, motivation and cognitive development (Mark & Campbell, 2011). People tend to engage in activities based on their sense of competence, regulating their own actions. Bandura's theory recognises the need for autonomy or the desire to self-initiate and self-regulate an individual's own behaviour, which is a psychological need in self-determination theory (Roca & Gagne, 2008) that has to be met in order to be motivated. It could be concluded that teachers do not want to feel forced to participate in blended learning activities, but that this should be fully volitional, which would lead to higher motivation to participate in such activities.

Interrelated factors indicate that behaviour is a complex concept in which there are different theoretical perspectives that could be investigated. Internal and external elements influence behaviour, but SCT brings them together and demonstrates the interrelated nature between the different factors. The complexity of human behaviour illustrates that different factors influence the decision whether to implement digital technologies in teaching and learning, including institutional perspectives, motivation, beliefs and attitude.

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2.9 CONCLUSION

Chapter 2 provided a comprehensive overview of the literature concerning the nature of blended learning and the value it has in higher education, highlighting the potential digital technologies have in HPE. Understanding who the teacher is as a doctor, a teacher in the 21st century, a lifelong learner and the context in which they teach paints a better picture of the world of the teacher. To understand teachers' perspectives and experiences with technology and factors influencing the implementation of blended learning in HPE, Bandura's SCT was drawn on. Individuals are shaped neither by internal nor external stimuli, but rather by the interaction between behaviour, cognitive and personal factors and environmental events. Consequently, in order to understand human behaviour, both individual and environmental factors need to be considered.

The next chapter will provide an overview of the research methodology used in this study.

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CHAPTER 3:

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The process of research has been described as a systematic investigation by means of collecting, analysing and interpreting data (Burns, 1997). The purpose of educational research is to attempt to understand the world, which is influenced by how the world is viewed and interpreted (Merriam, 1991). This chapter provides an overview of the research paradigm and the research methodology, focusing on the process and methods employed to gather suitable data, which could assist me in answering the research question. The most important focus was to capture participants' experiences and understanding of and involvement in teaching with technologies, their perception of digital technologies, the factors that influence their decision and circumstances to integrate digital technologies in teaching and learning.

3.2 AIM OF THE STUDY

The main aim of the study was to investigate and identify factors that influence teachers' integration of a blended learning approach in their teaching in an attempt to answer the research question: What are the factors that influence MBChB teachers' integration of blended learning in their teaching?

The objectives to support the study were:

- To understand how teachers view blended learning
- To explore the possible factors enhancing or inhibiting the use of blended learning

3.3 RESEARCH PARADIGM AND DESIGN

One's own lens through which one view the world could influence the way we study and interpret knowledge (Mertens, 2005) and therefore the implementation of a research paradigm. Research paradigms provide frameworks to orient a certain way of thinking; they set the motivation and expectations for research (Mack, 2006; Creswell, 2009). Neuman (2000) and

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Creswell (2003) refer to a paradigm as epistemology (how knowledge is acquired) or ontology (how the world is understood). One's way of thinking is guided by the selected paradigm which informs one's approach to research and selection of a research design. This coherent and logical flow assists in answering the research question effectively.

Mackenzie and Knipe (2006) narrow a paradigm down to theoretical paradigms, and the interpretivist paradigm was selected as appropriate for this study. My understanding of interpretivism is based on the perspective offered by Henning, Van Rensburg and Smit (2004), who describe the notion as interacting with participants, making sense of their knowledge and attempting to understand their reality and experiences. De Villiers (2005) explains that the interpretive paradigm attempts to make sense of multiple worlds, including both ontological and epistemological perspectives. The attempt to understand my participants' reality informed my selection of interpretivism.

Ontologically speaking, interpretivism assumes that multiple truths are considered in a single phenomenon and that it is closely related to one's view of reality. Interpretivist researchers that adopt a relativist ontology should understand "the diverse ways of seeing and experiencing the world through different contexts and cultures" in order to not to interpret participants' events with one's own bias (Hammersley, 2013:26). Epistemologically speaking, which is closely related to ontological perspectives, "inquiry is value-related and findings are subjective" (Kroeze, 2011:5). Interpretivism as an epistemological approach allowed me to view the world of the participants through their perceptions and experiences (Thanh, Thi & Thanh, 2015). I therefore relied on the participants' views of the situation being studied (Creswell, 2003) and recognised the impact of my own background and experience on the research.

Having a comprehensive, holistic understanding of the participants and the problem in order to find the rationale behind their behaviour is in its complexity the focus of an interpretive approach. Instead of attempting to understand the population by generalising, an interpretivist perspective provided me with a deeper understanding of the complexity of the phenomenon (Creswell, 2007). The strength of interpretivism that I could draw from was a deeper understanding of the participants' social context. Interactive interviews provided me with authentic information by means of probing the participants' thoughts, values, prejudices and views (Wellington & Szcerbinski, 2007). However, interpretivism has not only strengths, but also limitations. Mack (2010) refers to ontological views as subjective rather than objective, which I soon realised because of my own interest in and belief about blended learning.

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Interpretivism is often used concurrently with postmodernism, echoing traits in terms of its assumptions about reality, knowledge, truth, cognition and methodology. Therefore, it can be concluded that interpretivism is a typical postmodern epistemology (Kroeze, 2011). In this study, the interpretative approach assisted me in capturing the participants' experiences with and perceptions of digital technologies. It gave me a deeper understanding of the environments in which participants taught as well as how they implemented blended learning differently in the clinical and classroom teaching environment. This approach gave me the scope to ask probing 'why' and 'how' questions (Falconer & Mackay, 1999).

A qualitative research design is based on the interpretative paradigm (Nieuwenhuis, 2016) and was selected in this study in an attempt to understand and capture participants' lived experiences through the investigation of their behaviour. This research design enabled me to report on how individuals understand and interpret the world and how they construct meaning from their personal experiences (Silverman, 2016). Mouton (2001:194) refers to this as having an "insider perspective" on individuals' view of the world. The word "qualitative" stresses that reality is socially constructed and that an in-depth understanding of the problem will be developed. A strength of a qualitative research design that is highlighted in this study is the natural setting or context in which the research is conducted, which aided me in understanding the meaning my participants gave to events (Miles & Huberman, 1994). A better understanding of my participants and their context was key in interpreting the data (Willis, 2007). Furthermore the participants' multiple perspectives and experiences allowed me to explore their understanding of the research problem. According to Willis (2007:194), "different people and different groups have different perceptions of the world". Participants' different perceptions were beneficial as their multiple understandings of the world added to rich data and a more comprehensive understanding of the data (Morehouse, 2011).

Some researchers might argue that the "intensive personal involvement and in-depth responses of individuals secure a sufficient level of credibility and reliability" (Agar in Cohen, Manion & Morrison, 2001:135). However, Hammersley and Silverman (in Cohen et al., 2001) argue differently. Qualitative research might be challenging to replicate and in order to ensure research quality, measurement criteria have to be put in place to establish the trustworthiness of the study (Lincoln & Guba, 1985; Frambach, Van der Vleuten & Durning, 2013).

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3.4 THE CONTEXT OF THE STUDY

The importance of understanding the context of the participants is emphasised in qualitative studies as data is collected from participants that are immersed in their setting in which the research is framed (Morrison in Cohen et al., 2001) and is known to influence their view of the world. In this study it is essential to understand the background and context of the institution as well as the MBChB programme to get a better understanding of teachers' level of technology integration in the learning and teaching practices.

The FMHS at Stellenbosch University offers six undergraduate health professions programmes: Bachelor of Medicine and Bachelor of Surgery (MBChB), Bachelor of Occupational Therapy (BOccTher), Bachelor of Science in Dietetics (BScDiet), Bachelor of Science in Physiotherapy (BScPhysio), Bachelor of Speech-Language and Hearing Therapy (BSL and HT) and Bachelor of Nursing and Midwifery (BNurMid). This study focused on only a part of the MBChB programme.

An overview of the structure of the MBChB curriculum follows: The programme runs over six years and is divided into three phases. Phase 1 is called the Pre-Clinical Theory Phase and entails studying natural and social sciences within the health sciences context. This phase is mainly theoretical. Students are introduced to clinical skills only in the last semester of the Pre-Clinical Theory phase. In Phase 2, the Early Clinical Rotations and Middle Clinical Rotations, the programme is more clinically oriented and covers both theoretical and practical aspects of body functions, organ systems and disorders. The third phase, called the Late Clinical Rotations, stretches over a period of 18 months and it takes place mostly in the clinical environment (Volmink, 2014). After graduation there is a two-year internship and one year of community service before the graduates can register as independent practitioners with the Health Professions Council of South Africa (HPCSA). The focus of this study was the Early Clinical Rotations phase, which is essentially year 3 of the programme.

The MBChB programme has an annual intake of about 300 students. In the third year of training, students alternate between clinical rotation periods and theoretical blocks. This arrangement allows for fewer students on the clinical platform at a time, which provides for small group interaction and more practice opportunities. The third year includes the following domains: Internal Medicine, Obstetrics and Gynaecology, Paediatrics and Child Health, Surgery, Health and Disease in Communities, and Clinical Skills. The early clinical rotations

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are structured as four weeks of continuous clinical training where students can commit all their time to learn in small groups from doctors, senior students and allied healthcare workers in the clinical environment, while observing and interacting with patients. Besides these four weeks in the clinical environment, students have their theoretical blocks that take place face-to-face in the classroom setting.

Table 3.1: Theory and clinical modules in year 3

Theory modules	Clinical modules
Neurosciences	Primary Health Care
Musculoskeletal Systems	Internal Medicine
Haematological Systems	Paediatrics & Child Health
Principles of Palliative Care	Obstetrics & Gynaecology
	Surgery
	Clinical Skills

These modules in the third year require different types of teaching approaches. The teaching strategies that work well in the theory modules might not be as effective in the clinical setting and vice versa. Examples of teaching strategies that are commonly utilised include simulations, tutorials, lectures, bedside teaching, small group discussions and case studies. A significant amount of the learning in the clinical rotations takes place through bedside teaching where students have the opportunity to consult with patients, 'present' cases to their supervisors and have discussions regarding certain subjects. The theoretical modules, however, tend to be taught in classroom settings with bigger groups of students where teachers mainly use PowerPoint lectures. Some teachers implement blended learning approaches in the form of video tutorials and e-tivities. For the purposes of this study, it should be kept in mind that the third-year curriculum constitutes both theoretical and clinical modules, which are taught in different environments and that the need for resources and support differs significantly in the hospital and the classroom context.

3.5 DATA COLLECTION

The following section covers the selected population and data collection process in this qualitative research study.

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3.5.1 Population and sampling

While there are many people involved in the teaching of the students during their third year, each of the modules has a specific teacher, called the module co-ordinator, who is responsible for coordinating the teaching opportunities during the module. The population for this study consisted of the ten module co-ordinators in the third year of the MBChB programme. It was decided to use total population sampling (Etikan et al., 2016) because the ten module chairpersons in this specific population co-ordinate modules which are quite different in nature and this would yield the best representative sample for the study. All the participants were experts in their respective medical fields, with several years of teaching experience both in the clinical and classroom settings. While all the participants, except for one, were medical doctors, they came from a variety of specialities within medicine, which aided in rich data collection.

3.5.2 The recruitment process

The ten module chairpersons of the third-year modules were invited via email (Appendix D) to take part in the study. The email included the aim, objectives and purpose of the study as well as the informed consent form. Participants who agreed to take part in the study were asked to read through the informed consent form (Appendix C) prior to the individual interview, and the form was then signed by both the participant and the researcher on the day of the interview. A total of eight participants agreed to take part in the interviews (n = 8).

3.5.3 Semi-structured interviews

Conducting interviews in qualitative research may provide the participants with the opportunity to explore and reflect on their understandings (Holloway & Wheeler, 2010), providing insightful information regarding the research problem as well as insight into the participants' thinking processes (Almeida et al., 2017). Semi-structured interviews can generate contextual accounts of how participants interpret their experiences (Schultze & Avital, 2011) and are the most common type of interview in qualitative research (Holloway & Wheeler, 2010). The interviews allowed for different viewpoints of the participants (Anderson, 2012; Patton, 2002). An interview guide, with some pre-determined questions, assured some kind of commonality, covering the same material in all the interviews (Patton, 1990; Holloway & Wheeler, 2010). Additionally, probing and clarification questions added to the flexibility of the interviews and provided a chance to explore issues that came up spontaneously (Berg, 2009; Gray, 2004).

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Notes were limited to probing questions that needed to be answered later in the interview in order to observe impressions and emotions that might not reflect in the transcripts.

Prior to the interviews, a pilot interview was conducted with a colleague who worked at the Centre for Health Professions Education and who had an interest in blended learning. This resulted in some minor changes to the interview guide (Appendix E). The data collected from the pilot interview was not used for this study.

The interviews took 30-40 minutes each and most were conducted in the Centre for Health Professions Education's library in the FMHS, which is a quiet and comfortable area that provided a safe atmosphere (Connaway & Powell, 2010). This space was selected by a few participants who preferred to meet in a quiet space that was outside of their department in the hospital. Some of the participants, however, preferred to meet in their own offices in Tygerberg Hospital due to their limited time available for the interview. All the interviews were recorded with a digital recorder, and the recordings were then temporarily saved on a password-protected computer.

The raw data consisted of audio recordings taken during the interviews. I transcribed the first interview in order to engage more profoundly with the content, and the rest of the interview recordings were transcribed by a professional transcription service. The transcriptions were anonymised by giving codes to the participants, and then they were sent to the respective participants by means of email for verification. Audio recordings and transcriptions were saved on my password-protected computer.

3.6 DATA ANALYSIS

Data analysis and coding were done manually, as the amount of data could be handled without using analysis software. As a point of departure, in order to identify, analyse and report patterns, thematic analysis was used (Braun & Clarke, 2006, 2012, 2013). An inductive approach allowed findings in this study to emerge from the raw data (Strauss & Corbin, 1998) without restraints from structured frameworks. Codes and themes were identified following Braun and Clarke's six-step framework (2006) (Figure 3.1). This framework provided a structure that allowed for analysis to move beyond only describing what participants said to also interpreting it.

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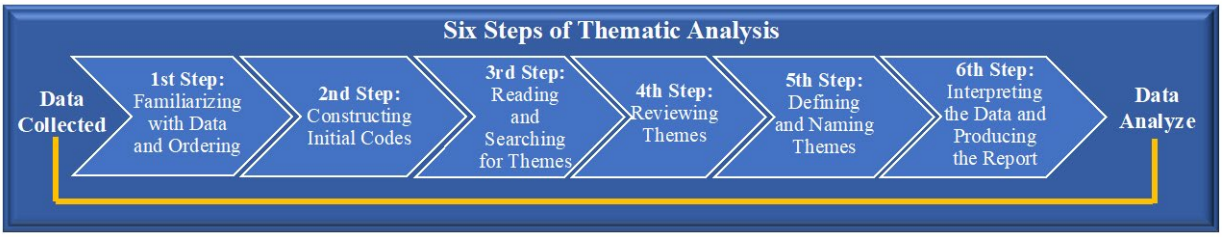

Figure 3.1: Braun and Clarke's six-step framework (2006) for thematic analysis

The process that was followed in the data analysis was as such:

Step 1: Become familiar with the data

I approached the analysis with some prior knowledge of the data as the data collection was done by myself. A shift in focus was made from generating data to analysing the data. I became familiar with the data by actively reading and rereading the transcripts for a holistic overview and understanding of the text while making meaning and searching for possible patterns. Reading through the transcripts shaped my ideas and possible patterns. Becoming "immersed" in the data allowed me to make notes of interesting features and early impressions as well as ideas for codes to go back to in following steps of analysis.

Step 2: Generate initial codes

An inductive approach was followed by organising the raw data in a meaningful, systematic way. Open coding was used, which means that codes were developed after rereading the transcripts and reflecting on the data as I worked through the coding process (Patton, 1990). Coding assisted in reducing the data into smaller, more manageable chunks. I did not assign codes line-by-line, but rather to data that captured interesting features and that was relevant to the research question.

After step 1, I had initial ideas of issues that came up in most interviews and preliminary codes were developed as a starting point. I worked through the transcripts, assigning codes to relevant data. After each transcript was coded, I read through the codes and modified some before moving on to the next transcript. New codes were generated where necessary. This was done by highlighting and colour-coding relevant sections and adding sidenotes with the codes.

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Step 3: Search for themes

I started collating codes that were related into preliminary themes. All data that was relevant to each potential theme was grouped into broader themes. This required the use of sticky notes to write each code on a separate piece of paper, organising them into potential themes. I started thinking about the relationship between codes, themes and subthemes. Two or three iterations were executed before finalising themes and subthemes, which meant I had to go back to the transcripts, review the codes and go through several discussions with supervisors until the most meaningful themes and subthemes were identified.

Step 4: Review themes

During this phase, I revised and modified preliminary themes and subthemes that were identified in Step 3. Revision meant that data associated with each theme and subtheme needed to be reviewed to ensure that codes related to the themes. Two levels of reviewing were followed: first the coded data was reviewed, which meant I had to read through all the collated extracts for each theme and decide on whether a coherent pattern formed. Codes that did not fit were reworked into different themes, and some codes had to be discarded. Second, the entire data set was reviewed, where the validity of the individual themes was considered and a decision made whether it represented the entire data set accurately. Similarities and overlapping that were highlighted in revising led to combining some themes. Some themes and subthemes did not have enough data to support them and had to be eliminated.

Step 5: Define themes

Ongoing analysis assisted in refining each theme and subtheme. The essence and scope of each theme and subtheme were clearly defined. A thematic map helped to visualise the story the data told and how themes and subthemes related and interacted with each other. Several maps were developed until the revising phase was complete where a final map was made to illustrate the relationships between themes and subthemes. See Chapter 4 for the thematic map.

Step 6: Write up

Finally, findings were produced based on the analysis of the research question. Notes from earlier phases were used to ensure that final themes were relevant to the data and that the research question was answered. This step will further be unpacked in Chapter 4.

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3.7 STRATEGIES TO ENSURE TRUSTWORTHINESS

In ensuring research quality, some measurement criteria were put in place throughout the study. Replicating qualitative research is difficult due to human nature; the same results will not be obtained when recollecting the same data (Merriam, 1998), and therefore it is essential to establish the trustworthiness of the study. Lincoln and Guba (1985) and Frambach et al. (2013) include several aspects as key criteria to contribute to trustworthiness of the study: credibility, transferability, dependability and confirmability.

Credibility was ensured by adopting well-established research methods. Yin (1994) refers to the importance of taking the correct measures for the concept being studied. Additionally, strategies were followed to provide participants with the opportunity to refuse to participate in the research study if they so wished. It was clearly stated that participants could withdraw from the study at any point. Furthermore, previous research findings were compared to ensure credibility. The ability to align and relate to findings in the existing body of knowledge is an important criterion to ensure credibility (Guba & Lincoln, 1989). Regular debriefing sessions were held with supervisors, bringing their perceptions and experiences to the table in order to widen my own perspectives. Alternative approaches were discussed, and attention to flaws and biases were pointed out as needed. Most importantly, member checking (Guba & Lincoln, 1989) was done by asking the research participants to read the transcribed interviews in order to confirm that the conversations were captured accurately.

Transferability refers to how research findings can be applied to other situations (Merriam, 1998). Detailed descriptions (Frambach et al., 2013) and sufficient contextual information are provided about the context of the study to enable the reader to make a transfer relevant to their own situation (Lincoln & Cuba, 1989). Additionally, a detailed description of blended learning has been provided to the reader in order to compare the phenomenon in the research with others in similar situations. Dependability was improved by documentation that was kept in each stage in the research process in the form of field notes. In addition, the analysis process was documented for consistency of findings. Confirmability was achieved by keeping an audit trail in the form of notes taken throughout the interview and analysis process in order to trace the research steps. I wrote down my perspectives and thoughts after each interview. In the reading process of the transcripts, ideas that stood out and that related to the research question were written down. These notes also enabled ideas that developed to be traced. Reflecting on my own position and standpoint assisted in preventing biased viewpoints and predispositions.

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3.8 THE ROLE OF THE RESEARCHER AND ENSURING REFLEXIVITY

The role of the researcher is to collect, analyse and interpret data (Merriam, 2008), which calls for the responsibility to be "extremely sensitive to the role of context" (Henning et al., 2004:20) when making judgements about the data. This responsibility creates a need for an awareness of my background as an instructional designer and employee at SU in order to minimise researcher bias. As I was known to the participants, it would have been easy to become subjective in the context (McMillan & Schumacher, 2010). According to Guba and Lincoln (1985), the researcher cannot take themselves out of qualitative analysis. Therefore, in order to make sure I considered, recognised and challenged my own assumptions, I acknowledge that my close relation, background and opinion of blended learning could influence rational thinking regarding the implementation of blended learning and could cause biased opinions regarding the topics and themes found in the data.

Reflexivity is being aware of the self and the relationship between the self and the research environment (Lamb & Huttlinger, 1989) and often refers to the researcher's role in qualitative research (Gouldner, 1971). The term "reflexivity" is used in research discussions indicating that the researcher should engage in continuous self-critique and explain how experience has influenced the stages of the research process (Koch & Harrington 1998; Hibbert, Coupland & Maclntosh, 2010). To ensure reflexivity and limit subjectivity (Lewis, 2000), I had to recognise my own perceptions and opinions about blended learning to ensure that they did not influence the findings of the study. Burns and Grove (1987) refer to "intuiting", which requires the researcher to reflect on their own perceptions in order to recognise their own bias.. This was done by keeping a journal articulating my personal views and insights about blended learning; this is a method to enhance credibility in research (Chiovitti & Piran, 2003). In this way, any preconceived ideas could be set aside to prevent them from directing the study.

3.9 ETHICAL CONSIDERATIONS

Approval for the research was obtained from the Health Research Ethics Committee at the FMHS, SU (S19/04/077) (refer to Appendix A), which is a requirement in South African universities when research involves human respondents (Israel & Hay, 2006). The research conformed to the ethical guidelines of the International Declaration of Helsinki. In addition, data collection only commenced after institutional permission was obtained from SU (refer to Appendix B). Participation in the study was voluntary and informed written consent was

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obtained from the participants before data collection commenced (refer to Appendix C). Participants were given information about the study in writing and were allowed to end their participation at any time without any consequences.

In promoting research integrity, participants' confidentiality was protected with the removal of personal identifiers and care was taken to prevent research misconduct (Israel & Hay, 2006). All data collected was stored on a password-protected computer. Audio recordings were deleted after transcription. The research did not hold any anticipated risks. Participants were not paid for taking part in the study but were provided with a coffee voucher for the time they offered during their interviews.

3.10 CONCLUSION

This chapter included a discussion of the methodology used to interrogate and analyse teachers' perspectives and experiences with blended learning and factors that influence their implementation of blended learning in the MBChB programme. This qualitative study followed an interpretivist approach in an attempt to understand the participants' reality. An in-depth thematic analysis process was described, and themes were identified. The findings that emerged from the study will be discussed in Chapter 4.

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CHAPTER 4:

RESEARCH FINDINGS

4.1 INTRODUCTION

This interpretivist study approach generated qualitative data from semi-structured individual interviews with participants described in the previous chapter. Thematic analysis was employed to identify and analyse data in order to report findings. Possible interrelated factors were identified that influence teachers' implementation of a blended learning approach in their teaching in an attempt to answer the research question: What are the different factors that influence MBChB teachers' integration of blended learning in their teaching? The research findings are presented in five main themes and subthemes.

4.2 FINDINGS

In terms of data analysis, an inductive approach was followed to establish themes and subthemes from the data. The five main themes that emerged were meaning-making of blended learning, the medical curriculum, teachers' individual differences, the medical student and institutional factors (see Table 4.1).

Table 4.1: Themes and subthemes of the study

Themes	Subthemes
Theme 1: Meaning-making of blended learning	1. Defining blended learning
	2. Pedagogical advantages of blended learning
	3. Implications of adopting a blended learning approach
Theme 2: The medical curriculum	1. The classroom learning environment
	2. The clinical learning environment
	3. The doctor as a teacher
Theme 3: Teachers' individual differences	1. Attitude towards change
	2. Teachers' self-efficacy

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Themes	Subthemes
Theme 4: The medical student	1. Teachers' perceptions of student learning
	2. Engagement of students
Theme 5: Institutional factors	1. Faculty development
	2. Internet connectivity
	3. Clarity of technical support responsibility in learning spaces

In the next section, the findings are explored in the different themes and subthemes by referring to direct quotes from the transcripts.

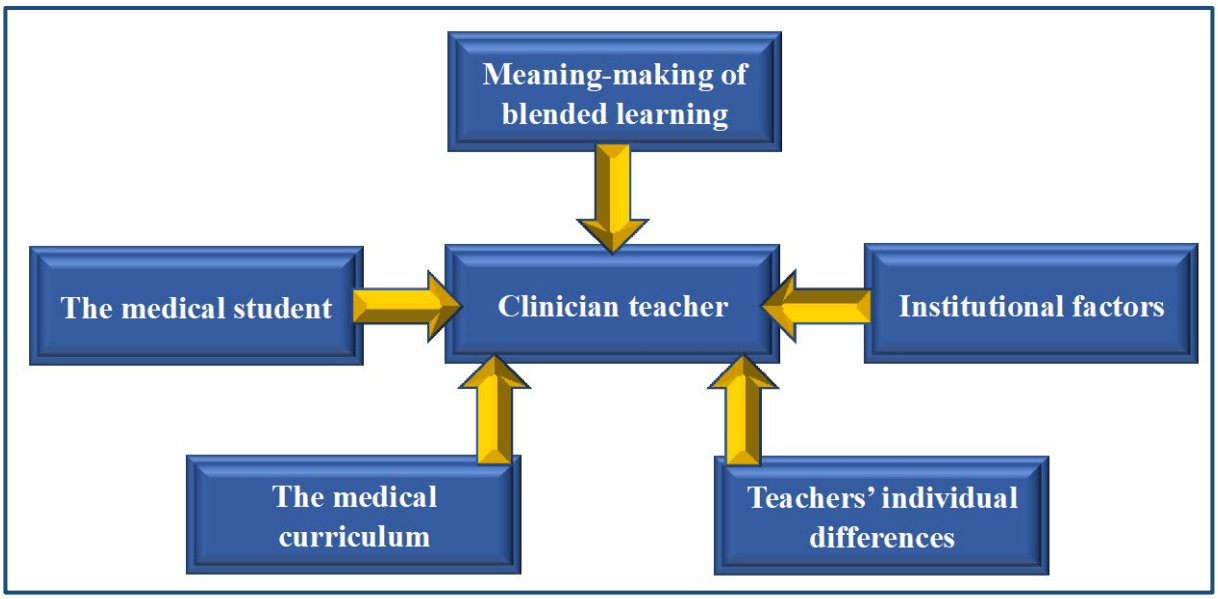

Figure 4.1: Thematic map

4.3 THEME 1: MEANING-MAKING OF BLENDED LEARNING

This theme revealed how participants positioned and understood blended learning in their teaching, what the concept entails, what blended learning means in practice and what the implications are in the implementation process in order to reap the benefits it offers. Three subthemes emerged in this theme: defining blended learning, pedagogical advantages of blended learning and implications of adopting a blended learning approach.

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4.3.1 Subtheme 1: Defining blended learning

Participants indicated different levels of knowledge and understanding of blended learning.

The following respondents indicated a good understanding of what blended learning means:

> *"Blended learning to me is where you are always using different instructional media to achieve your teaching and learning outcomes. So, it would be usually combining some form of electronic communication or electronic learning platform with convention learning, where students don't necessarily have direct contact with their teachers. From that point of view, it gives them different opportunities and different ways to communicate and different ways to learn, to access the teaching platform."* (L3)

> *"I suppose it's including more than one sort of approach to the whole aspect of learning, more than just the old traditional standing in front of the classroom method, but actually more a combination of approaches. So, different approaches, different technologies basically."* (L4)

However, the majority of the respondents were uncertain about what blended learning entails:

> *"Oh, now you're catching me offside. I suppose it's – if I give you my personal opinion, it's using different options available to one to improve the quality of delivering a message of learning in a pedagogical sense to learners."* (L8)

> *"To be honest, I'm a little bit uncertain. I think it means using various technologies to assist learning."* (L6)

> *"So, in theory, I think I've got an idea, but I haven't experienced much of it, no. So it's basically using technology in teaching, and then maybe I suppose those dolls as well."* (L2)

Participants' understanding of blended learning was followed by a discussion of how they perceived the advantages of blended learning in their different teaching environments.

4.3.2 Subtheme 2: Pedagogical advantages of blended learning

Although participants indicated different understandings of blended learning, it was clear that there were aspects of blended learning that they believed could be valuable and advantageous in their teaching. Three advantages were mentioned, namely pedagogical approaches that allow

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for optimised contact time with students, pedagogical approaches that allow students to work at their own pace, and ability to access content anytime and anywhere.

The following quotes refer to pedagogical approaches that could optimise contact time with students. One respondent (L3) described the process of getting students prepared for a more meaningful contact session.

> *"I have a contact session on a certain subject, I will provide them with resources, and an activity to do, maybe a quiz or a discussion, or some form of task that they have to complete, just to make sure that they have prepared well for the face-to-face contact, that I don't spend the first 20 minutes of a 40 minute session just rehashing old information. But that we can really start off from the get-go, get into the 'meat', you know, getting the meaningful work done in the contact session … that we can almost carry on with the discussion at a higher level of learning, rather than just a base knowledge of facts but more integration, decision making processes, which, for clinical teaching, is very important."* (L3)

Another respondent (L4) mentioned that if students came prepared to their clinical teaching sessions, the conversations could advance beyond only knowledge sharing.

> *"… can get them to be a bit more prepared when they arrived at the bedside, so you can spend more quality time on critical thinking and not just necessarily focusing on the knowledge. So from that point, in terms of saving time and being a little bit more guided, or structured when you are actually seeing them, it will definitely help."* (L4)

Additional to optimised contact time, participants felt that blended learning offers pedagogical approaches that allow students to work at their own pace and have more control over their own learning.

> *"… students reaching their outcomes … it [learning technologies] provides the students with opportunities to go back, revisit whatever resource we have given them if they haven't understood … students have more than one opportunity of getting to it."* (L3)

Another valuable advantage that participants referred to was the accessibility and availability of content that a blended learning approach provides. While some participants (L8) referred to content that can be accessed outside of the classroom environment, others (L4 and L2) referred

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to the easy access to information that students and themselves as the teachers have available during ward rounds.

> *"... the technology is constantly available, whereas I am not. So, I can have a student and say to him listen, access this information there, do that work, do that work and answer this ... because we find that they don't engage with it until the last minute. So the consistency of the availability of content on SUNLearn far supersedes what I can do in a class."* (L8)

> *"On a ward round every now and again you are confronted by a question for which you don't know the answer yourself. You see a condition, which is a rare condition that you don't see on a regular basis, so you are not up to date on everything. So then I am completely happy about taking my phone and reading it there and then ... when the question is there, you stop there and then and you Google it."* (L4)

> *"Because even if we on the ward rounds, and we are faced with a question that I can't remember, I ask who was going to look it up for us. So it's amazing that you actually have the information, that they're all too willing to look up and then it's a shared learning moment. It's amazing what technology can do, in the planned and the not planned you grab the learning opportunities."* (L1)

In order to reap the benefits of digital technologies in teaching and learning, participants realised that these technologies certain implications for them as clinician teachers.

4.3.3 Subtheme 3: Implications of adopting a blended learning approach

Participants realised that there were certain implications attached to the adoption of a blended learning approach. A significant factor that was mentioned by most participants was the time and effort required to implement learning technologies.

Some participants experienced spending the initial time to create content as beneficial in the sense that it decreased their workload and saved time in the long run, but they still understood that it requires application time.

> *"Every few weeks you have another group of students. So, it's like re-inventing the wheel repeatedly. So in that sense, you can definitely save time just finding the right tool."* (L4)

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> *"It's a lot of time and effort initially, but the maintenance that you spend on keeping resources going and updating resources is a lot less than giving repetitive face-to-face discussions … So the decrease in duplication of other work, I mean, if you are giving a lecture, having a podcast of a lecture …, takes up a lot less time and effort than giving that same lecture every couple of weeks to different groups of students. So, it benefits both in time and in learning … Time spent on blended learning to me feels like time that I am banking … the pay-off later is going to be a lot bigger than just trying to keep on doing what we are doing."* (L3)

While the idea of spending a significant amount of time creating blended learning materials was seen as positive for some participants, others experienced it as a never-ending process with no decrease in workload. These contrasting views are demonstrated in the following quotes:

> *"I know that people say it will make things easier and less time. But it is actually not. But it's actually more time intensive. And even if you put in that initial work, it doesn't get less."* (L1)

> *"SUNLearn courses is like a garden. It needs constant attendance. So it's a large amount of work to do it, and once it's done, it doesn't require that much work to tweak it and fiddle with it, but it needs constant work."* (L6)

The vast majority of the participants indicated a reluctance to implement blended learning due to the time constraints in the clinical environment. While one respondent (L4) referred to content development as time-consuming, another (L6) referred to spending time understanding the online platform.

> *"I don't think we use a lot of online technology. But it's probably more to do with finding the time to develop the content … you first need to spend the time to develop the content …"* (L4)

> *"… SUNLearn (LMS) … But I think people are probably reluctant on that [implementing blended learning], because it requires an application of time."* (L6)

This main theme reveals the importance of understanding what blended learning implies and what the benefits are in teaching and learning, as well as what the implications are for the teacher when implementing a blended learning approach. The next theme highlights the

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different learning environments in a medical curriculum and the role of the clinician teacher in these environments.

4.4 THEME 2: THE MEDICAL CURRICULUM

The complexity of a medical curriculum, which involves clinical and classroom learning opportunities, is highlighted in this theme. The discussion involves how the different learning environments influence the participants' decision-making to implement blended learning activities. The dual role of the clinician in the medical curriculum is also emphasised. Three subthemes emerged during the data analysis process: the classroom learning environment, the clinical learning environment and the doctor as a teacher. These subthemes are discussed below.

4.4.1 Subtheme 1: The classroom learning environment

When participants were prompted about their use of technologies in a classroom learning environment, most replied with examples of using the flipped classroom approach. One participant (L2) could see the benefit of technologies in classroom learning in order to create more opportunity for discussions and for themselves to take on a facilitator role.

> *"Giving a lot more responsibility to the student, and your kind of almost like flip the classroom. That's also a form of blended learning, get the student to watch a video beforehand, read an article online before, and then you go to class and then you can just facilitate, they contribute a lot more."* (L2)

However, although there appears to be a willingness to teach with technologies, the reality of clinicians' limited time for classroom teaching seemed to be a hindrance in the mastering of teaching with novel tools.

> *"I only have one week, so I have to get it right [master the tool] in that one week. If you were a lecturer that was lecturing throughout the whole year and you could try and try again and try again, you would probably get used to it and figure it out [figure out using technologies]."* (L7)

This respondent commented on the value of immediate feedback in the classroom learning environment which technology cannot necessarily provide.

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> *"I have to post assignments that my students on SUNLearn have submitted, and post feedback. You see, now I have to type that feedback, whereas I would prefer to have spoken that feedback to them. … because they can engage with me after the interaction and ask questions, because often after a delivery of an interaction workshop, tutorial, lecture, I have that group that comes and stands next to me and I know, okay. That's the time that I appreciate most, because now immediately I know whether I have pitched what I said at the right level, based on the questions that I'm confronted with."* (L8)

In addition to participants' use of digital technologies in the classroom learning environment, they also responded with different opinions regarding their use in the clinical learning environment.

4.4.2 Subtheme 2: The clinical learning environment

Participants mostly referred to the clinical context when asked about their use of blended learning in their teaching, and in many cases, their responses were not in favour of the use of blended learning in a clinical context.

There was a feeling that some learning can only be facilitated in a face-to-face setting with the student in the clinical area. One respondent (L1) described how the online component of blended learning is not suitable for a practical subject where skills and knowledge need to be demonstrated and applied.

> *"It's a clinical rotation, it's not something that you can necessarily do on 'e' because it's not knowledge, integrating or anything like that. I think watching something does not mean you can do it. So that's where the actual practice still needs to happen."* (L1)

There was a perception that learning and applying skills in the clinical setting in the presence of a patient was the most effective and valuable learning tool and that it could not be exchanged for online learning.

> *"Everybody would accept that the most effective is to see the actual patient, and that must be because in some way the emotional value you attach to that encounter aids your memory, like it or not."* (L6)

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> *"... certain concepts cannot be conveyed unless you have a presence ... certain skills, you have to be present and show them and actually demonstrate. You know, a surgical skill, how to remove a lump from my hand here, or how to stop a nose from bleeding ... you can go and watch a video, but there are things that you need to say to the student, and show and demonstrate. You still need that touch of being present when you demonstrate ... communication skills, how to talk to patients, how to be patient centred, how to engage that patient's feelings and context."* (L8)

Participants highlighted the importance of timely or immediate face-to-face feedback in a clinical context, which seems to be something that not all technologies are able to facilitate.

> *"The actual face to face, the actual helping people, giving them feedback, correcting where they are wrong with a technique or something. So it can't just be the 'e' [online component]."* (L1)

Contrary to the majority of the participants that could not see the benefit of a blended learning approach in a clinical context, one participant (L1) argued differently and was of the opinion that blended learning could be useful by including the online component of blended learning to prepare students but keep the best features of face-to-face to teach students clinical skills.

> *"... even if we do the teaching of the clinical skills, again, we use videos beforehand that they can watch ... But then when they come, again, small groups with facilitators so that they can recover and revise and go back to the information. ... because it's such a practical rotation, it's more about them having things available beforehand and then practice, and then they can come back."* (L1)

In understanding participants' choice to implement digital technologies in the classroom and clinical learning environment, the role of the clinician teacher needs to be understood.

4.4.3 Subtheme 3: The doctor as a teacher

This subtheme portrayed a strong reference to clinicians' dual role as a doctor and teacher. Participants made it clear that they were doctors by profession and the additional role of being a teacher was challenging. In this quote, it is evident that some participants identified as clinicians/doctors and not as teachers.

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> *"Because us as lecturers, we are primarily, obviously doctors. We're not teachers. We try to be. ... I'm a doctor, not a teacher [laughs]."* (L7)

A few participants highlighted their roles as clinicians and teachers as the reason for them not getting time to explore new ways of teaching.

> *"I've got a full-time clinical job as well ... most of my teaching, most of my administration I must do in my free time or I must do it when I've got ten minutes here and then. ... people obviously either don't have time ..., because it's always like the tenth thing that you have to squeeze in for the day."* (L2)

Participants had divided responsibilities and commitments, and from the following responses, it was clear that their clinical duties would normally be prioritised.

> *"... is the thing of prioritising teaching in the sense of giving it our most important resource as clinicians, is time. So if you want it to be prioritised, you have to give the clinician time to work on it. So if they give me time to work on it, one day a week, one day in two weeks, then you can get something done. But the clinician pressures always push out the rest."* (L2)

> *"... clinical teaching staff get caught up in a spiral, where clinical responsibilities make up the bulk of their time, and teaching is a smaller part of it."* (L3)

Some participants' responses indicated that they had not yet fully developed in their teaching practices due to their lack of knowledge about teaching.

> *"I think it's just as I am learning more about teaching, because I never had any educational teaching. It was only the PRONTAC [PREDAC] that I attended. So it was like you go along and you teach as you go along, what you think is the right thing to teach and how you were taught and so forth."* (L5)

This theme indicated that the learning environment and participants' belief in the suitability of technologies in that environment could have an influence on their decision to adopt a blended learning approach. In addition, the challenges of having a dual role as clinician and teacher were evident from participants' responses and seem to contribute to critical considerations associated with a blended approach. The following theme indicates specific individual differences that might influence participants to implement learning technologies.

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4.5 THEME 3: TEACHERS' INDIVIDUAL DIFFERENCES

Certain factors influence participants' willingness to change and to make use of digital technologies in teaching and learning. These factors were evident in this main theme. The subthemes that emerged from the data analysis were attitude towards change and teachers' self-efficacy.

4.5.1 Subtheme 1: Attitude towards change

Participants realised that with the changes that have been taking place in higher education with regard to teaching with technologies and understanding students' needs, they needed to adapt. All participants acknowledged the fact that change is necessary; however, different reasons for changing were voiced. One participant saw the need to change in order to be relevant to changing times.

> *"The information they speak about, the industrial revolution and stuff that's going to happen. If you don't adapt, you will be left behind."* (L8)

As well as the need for change to stay relevant, participants also saw the need to implement learning technologies for pragmatic reasons. Participants valued the affordance technology offers to accommodate bigger groups of students at a time.

> *"The numbers of students that we are training are getting more and more and more, and from a centralised training platform, the MBChB program is moving very rapidly to an almost completely decentralised platform. If we don't embrace technology, we're going to get stuck in the near future, where one teacher cannot teach a hundred students in ten sites. That's impossible, and we don't have enough teachers as it is."* (L3)

However, changing the way of teaching could be a daunting task for many individuals who do not like working with technologies and might have a resistant attitude. It is evident in the following quote that some participants preferred the conventional way of teaching.

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> *"I get anxious, I get angry, because I don't have a lot of sort of expertise on how to deal with problems … Like, I'm not particularly enthusiastic about changing the way I do it, because it will involve getting past that uncomfortable sort of stage of something I don't already know how to do … but I am quite resistant to change, I'm not very enthusiastic about new things, and I don't have confidence in dealing with sort of any kind of hiccup with the technology. So I don't enjoy it at all … I just want things to work from the beginning."* (L2)

Some participants demonstrated reluctance to consider alternative ways of teaching than what they were used to. The comfort and preference participants had regarding their way of teaching seemed to create a hesitance to change.

> *"... we say to them don't do a PowerPoint, just sit and have a group discussion with a smaller group, and they still say bring the computer, I want to give a PowerPoint lecture. It's so ingrained in people ... and they sort of feel comfortable because the information is on the screen and they don't have to answer difficult questions, they don't have to apply their minds, I suppose … People are very much stuck in the lecturer student sort of thing."* (L2)

It is evident in the following quotes that the human nature of holding on to the familiar makes it challenging to adopt a different approach to teaching. While one participant (L6) preferred the familiar, two others (L2 and L3) made reference to the difficulty in addressing conventional practices.

> *"most people will stick to – understandably – stick to what they are used to ..."* (L6)

> *"... what they know, what they have always done, and to really get them out of, almost a bad habit, you have to shake them a bit by the scruff of their necks and say open your eyes. This is here, and these are the ways that you will benefit from it."* (L3)

> *"So most people just see ugh, okay fine, I have to do two or three lectures, I'll do A, B, and C, and I get my PowerPoint and I give it. I don't think it even crosses people's minds to rethink how it's done, to look at the bigger picture."* (L2)

Besides reasons to change, two factors were evident that determined participants' attitude towards change, namely perceived usefulness (PU) and perceived ease of use (PEOU) (Davis

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et al., 1989). It is easier to make the transition to using technology if there is clarity about the practical value of the tool in teaching and learning.

> *"... definitely if I see a benefit in something, even if I'm not familiar with it, I'll spend some time and effort to become familiar with."* (L3)

Participants' attitude was also enhanced by the ease of use of technology. Participants seemed much more comfortable implementing a tool that was easy to use.

> *"So if you have a straightforward user-friendly program, Skype or whatever, I can use it."* (L4)

> *"... because the marking (of assignments) was also a bit easier ... on SUNLearn it was easy."* (L5)

In addition to participants' willingness to change, it also seemed that their confidence in using digital technologies determined the extent to which they implemented blended learning in their teaching.

4.5.2 Subtheme 2: Teachers' self-efficacy

This subtheme explains how self-efficacy can influence the decision to accept change or consider technology use. Bandura (1997) refers to self-efficacy as the belief in one's own ability to perform a task or behaviour, i.e. confidence in one's own ability.

Some participants lacked the confidence to use new, unfamiliar tools and did not feel equipped to teach with technologies. The following participant's remark reveals the emotions associated with using technology:

> *"I feel so incompetent, so I really don't enjoy working with it ... but I know some people have a more natural inclination to work with technology and they enjoy it. ... I don't think I've got a natural inclination towards technology, no."* (L2)

The following quote demonstrates how someone that is competent in their own area of expertise can feel inadequate and frustrated, and how teachers experience stressors differently:

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> *"I know it sounds so stupid, but the thing is we work in like a different world. It's like you work in this like war zone. You see hundreds of patients, and I'm comfortable with that. So, I'm comfortable with dealing with this complicated, difficult clinical environment, but then when I sit in front of a computer and I can't remember my password, or I can't even get into the module, I get so anxious and so angry."* (L2)

The fear of failure seemed to discourage some of the participants from implementing learning technologies. This particular participant expressed her experience with using technology as stressful and out of her control.

> *"So that again was something I tried, but because of the problems I experienced, I opted to play it safe the next time, because I can't handle that level of risk … So, all those practical issues make one forget about the gimmicks of using technology, and stick to the basics, because you know it's actually going to play and it's going to be there, and you're not going to be embarrassed … that's all that I tried, and I got such a fright that I stopped … So again, for fear of wasting time and embarrassment, rather leave it."* (L7)

> *"… is nerve-wrecking because people can call you on what you don't know. So, any teaching situation is at baseline a nervous situation, which you choose to be very prepared for, and try and control every variable. So, you don't want variables that are out of your control."* (L7)

In addition to the fear of failure, elements of embarrassment are a factor that can prevent the adoption of blended learning.

> *"When I tried it, it failed … If anything went wrong in terms of changing over the computer to different views and different settings, it broke the flow of my presentation. It's embarrassing, and the students lose interest and you lose respect in their eyes."* (L7)

> *"I need somebody to literally sit and hold my hand I suppose … I suppose I also sort of find it quite, I find it sometimes a little bit embarrassing to admit that I can't do it."* (L2)

Individual differences such as a general attitude towards change and differing levels of self-efficacy can potentially impact the inclusion of learning technologies in a learning and teaching context.

It is not only the role of the individual that impacts these choices, but also the types of students that teachers work with.

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4.6 THEME 4: THE MEDICAL STUDENT

It was evident in this main theme that participants' perception of the medical student, how they prefer to learn and whether they participate, influence participants' implementation of technologies in their teaching. The following subthemes were identified during the data analysis process:

4.6.1 Subtheme 1: Teachers' perceptions of student learning

Participants seemed to have a particular perception of how students would prefer to learn and indicated a willingness to make a change in teaching and learning in order to be relevant.

> *"I think it's also the students' environment. They are technologically advanced … So, I think we need to step up our game as well regarding that, and to make it more inclusive in our teaching, in order for the students to be more engaged in their learning process."* (L5)

> *"And I think also it's what the students, they use 'e' all the time. And so it's also tapping into what would work for them. And thinking about how our students would prefer to learn. And I think that's why it's important because sometimes I think their whole life is on e and you can't, not do e because otherwise, it's alien to them … You kind of have to inhibit their world, even if you come from a different one."* (L1)

Some participants assumed that students would enjoy learning with technologies and that it is the preferred mode of learning; however, from the data this appeared to be quite the opposite.

> *"I always assume that students will appreciate technology and things like the flipped classroom. But my very first attempt at the flipped classroom was actually not very good. And I remember that I put in an enormous amount of work and prepared things and I asked in advance to be prepared and kind of just making sure that they would have like the concepts in the class. But then the students didn't prepare … So the assumption is that students are well related to technology, and then they will use all of this and they will read. But that's not necessarily."* (L1)

Participants reported that students were unsatisfied and requested teaching that was familiar to them.

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> *"... whenever I have tried to use anything other than lectures and PowerPoint presentations, the students come to you and ask for the PowerPoint presentation … They were extremely upset that there weren't notes ... Then they want the whole notes, like they want every word that you said, verbatim, or the notes with everything in it, and then I must assume that they will at some point sit and read through that."* (L7)

> *"The students don't like that. Students seem to, some of them would like you to stand there and read your PowerPoint to them, which seems very pointless ... I think they're [students] not familiar with it."* (L6)

There are individual skills that students need in order to successfully participate in a blended learning approach, such as taking responsibility for their own learning and digital literacy. Participants seemed to be concerned that students did not know how to regulate their own learning, which could prevent them from getting the benefits blended learning could offer.

> *"Blended learning inevitably asks the student to do the knowledge bit. Take responsibility for the transfer of knowledge part, on their own time, before meeting with the expert, but they don't. So then you have set up this whole meeting of an expert, or you with them, so that higher learning can occur, and they didn't do the knowledge part. So, then it ends up, and this is literally what happens, then that hour that you set apart to discuss higher learning, becomes a transfer of knowledge."* (L7)

Participants were hesitant to implement a blended learning approach due to their perception that students were not ready to take responsibility for regulating their own learning. One respondent (L6) referred to students' ability to interact with materials.

> *"I'm sceptical that that's going to happen in January of a particular year, because I know for a certain fact for example that the January class is different to the March class in their ability to pay attention and to engage and interact. They're substantially different ... I am 95% certain that in January the first week of their studies, it's not going to happen."* (L6)

Another (L7) referred to the maturity of the student to be a requirement indicating how well they will be able to participate.

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> *"I just think that the level of blendedness that you can apply really depends on the maturity of the student. There is a huge difference between your first year and your sixth year medical student … But a first year might not interact in the same way as a sixth year would … I absolutely do not believe that third year medical students are adults [chuckles], and they are not self-driven [laughs]. So, that's why it's a waste for me to try and apply adult learning theory to them. I tried, and it didn't work [laughs]."* (L7)

Preparing students to learn with technologies is as crucial as preparing teachers to teach with technologies. Participants articulated that there was a need to prepare and orientate the students to learn with technologies and to ensure that they are digitally literate.

> *"…facilitate the students to also learn to work better with technology themselves, because if you're going to having to work with technology for your tasks … The challenge will obviously be how to do that and not disadvantage the students who have a baseline of technology."* (L2)

It is not only the participants' perception of student learning, but also students' engagement in activities that influenced participants' decision to implement a blended learning approach.

4.6.2 Subtheme 2: Engagement of students

It is clear from the data that teachers emphasised the lack of student engagement in the learning process. Participants' frustration was evident in their responses where time and hard work were put into restructuring lessons, but a lack of participation from the students made participants become demotivated in implementing learning technologies.

> *"… once using Socrative in a classroom. I think it was a class of 200 students and five people logged in. So, that broke it for me … and they either just didn't have the APP or weren't bothered to actually participate. So, then your whole process is a bit interrupted because this whole gimmick that you were trying to do to peak their interest is not just an embarrassment … But they don't participate, so they sit around on their computers, with earphones in their ears, showing you that they're not interested in what's happening here."* (L7)

> *"… you must also have the enthusiasm and you must put in everything, and they just literally sit back."* (L2)

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Participants came up with several possible reasons why students did not participate in blended learning opportunities in which the novel software and pedagogical approaches were to blame.

> *"They don't like Socrative, or don't latch onto it, because it's novel, and therefore they're frightened of it, and the flipped classroom the same. They're not used to it ... they are probably a little scared of it in case they are picked on or something like that. Because it's unfamiliar, they stand away."* (L6)

> *"But I think the students don't expect it, the students are not used to it [learning technologies] ..."* (L2)

Other participants blamed students' prior education as the reason why they do not take responsibility for their own learning.

> *"In school nobody prepares anybody for the next, because you're not told. So I'd agree that that first year is already quite a challenge for a lot of students, and if you add ... So I am fairly certain that the vast majority of the class, or too many of them, or that so many of them would make a considerable difference to using the work in class, would not go through the work before."* (L6)

Participants' perception of how the medical students would prefer to learn and how they participate in reality influenced their willingness to implement a blended learning approach.

The next theme highlights institutional factors as critical in the implementation of a blended learning approach.

4.7 THEME 5: INSTITUTIONAL FACTORS

The successful implementation of a blended learning approach is often related to the availability of institutional factors such as support and faculty development. Three subthemes emerged, namely faculty development, internet connectivity and clarity of technical support responsibility in the learning spaces. This theme reveals the importance of support from the institution in order to implement a blended learning approach successfully.

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4.7.1 Subtheme 1: Faculty development

The majority of the participants were in favour of faculty development programmes and thought that these could help them to acquire knowledge and skills on how to implement a blended learning approach.

A few participants seemed to be quite aware of their lack of technical knowledge and skills.

> *"Not very comfortable. So, I force myself how to use, so I can use a computer, I can make a nice PowerPoint presentation, I can use Word …, but as soon as there's a problem, or as soon as there is something that somebody hasn't told me this is how it works and I can't just follow the same path, then I become quite anxious. So, I actually don't feel very comfortable, except for the things that we already use in daily life."* (L2)

> *"I suppose I'm not the most IT au fait boffin … I realise that perhaps I could be more au fait, more on the ball in terms of other ways of using technology."* (L8)

Acknowledging their lack of knowledge and skills, some participants voiced their need for awareness-making and additional training.

> *"Because I think also you don't know what you don't know. And you don't know the possibilities unless you are exposed to it."* (L1)

> *"… a knowledge issue in terms of we haven't been exposed to it that much … better knowledge on our side, and exposure on our side …"* (L4)

Some participants admitted that they did not know where to start when implementing a blended learning approach. They felt that they needed guidance on how to rethink their respective curricula in using a blended learning approach.

> *"… I need a little bit of guidance in terms of how to start it … have a few practical tips of how to actually start the whole process."* (L4)

> *"So I'm obviously reading about stuff and I'm involved and I listen to everything, and I still can't really picture, sort of on a practical level, exactly what it means to make it blended learning, to be honest with you … I can't imagine, even if they give me six months just to turn everything into blended learning, I still don't know exactly what I would do. I think the first thing is to know what you want, before you're going to get there."* (L2)

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Participants acknowledged the benefit that faculty development holds in awareness making and knowledge and skills development; however, there was uncertainty in terms of how they had to implement a blended learning approach in their specific context.

> *"I've been on enough of these lectures and workshops to know a lot of the things that are available, and in terms of SUNLearn, I have been to all those workshops. But that doesn't make me comfortable and have insight into what would really work in a specific situation."* (L7)

It was clear that participants wanted to develop in their teaching and learning practices but that they needed individual assistance and not only faculty development offerings. After-service support and personal attention therefore play a critical role in technology use.

> *"I really feel actual involvement in the modules by experts from the educational department, people that know about blended learning, will help … In the actual design and planning of the technology, you would actually need enough people who could actually understand your module and sit with you and look through your whole module, and help you to spot places where you can use the technology … a more involved adviser, than just somebody that says please call me when you need anything."* (L7)

> *"I need somebody to sit with my module and say but you see this? This you can do in that and that and that way. This, yes, it's like that, but have you thought of this and this and this? I am sure that won't take a day. … make me aware of things that I can improve on in the delivery …"* (L8)

The importance of faculty development in the process of implementing learning technologies was highlighted in this section. However, additional institutional factors such as internet connectivity also influenced participants' behaviour towards implementation.

4.7.2 Subtheme 2: Internet connectivity

The successful implementation of a blended learning approach would require the institution to ensure reliable connectivity, among other things. Different aspects were highlighted regarding internet connectivity and the context in which the teaching was done since connectivity varied between the venues in the university buildings and the hospitals where the clinicians taught.

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Some of the participants felt that the institution was not providing them with adequate connectivity needed to implement blended learning successfully.

> *"University has lagged terribly with making wireless, good internet access available in the lecture theatres. So, Socrative a few years ago was not possible, just because there was no wireless, which is bizarre. Really, I can't comprehend why it's so slow. I mean, it's 2019. It's really shocking. I don't know how the wireless is now. ... but it's 2019. Please! It's shocking. Really, that's the only word to describe it. It's shocking."* (L6)

> *"How are you supposed to run anything on a system that you don't even know is going to be working when you get there? ... So for instance, I thought I really wanted to learn to do Prezi presentations and to use Prezi, but you don't know if you're going to get there and there won't be internet."* (L7)

It would seem that some areas in the hospital do not have internet connectivity, which puts a strain on teachers who attempt to implement blended learning.

> *"And then the whole idea was that it's also that they can download the app. There is no Wi-Fi in the hospital."* (L1)

Participants related their perception of internet connectivity to the availability of technical support.

4.7.3 Subtheme 3: Clarity of technical support responsibility in the learning spaces

The complexity of the different learning environments where teaching and learning occur at the FMHS left participants confused about the roles and responsibilities of the different information technology (IT) support teams. Most participants referred to a lack of IT support and clear communication between the role players, for instance:

> *"... call the hospital's IT people they say no sorry, it's not a hospital computer. So, to actually get somebody to sort out that computer's problem now is an issue."* (L4)

This participant was frustrated about the technology situation in the lecture rooms in their hospital department where they had limited internet connectivity and older equipment:

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> *"But we wanted to be able to view what's happening on our high tech planning computers in our lecture room, but it took us more than a year to just get the landline [laughs] fixed, from the one room to the other, so that there could actually be an internet connection between the two rooms … So, that stopped us from doing that."* (L7)

Participants indicated a lack of communication within IT services. These comments explicitly referred to a lack of IT support.

> *"IT, in my view, I think much of this problem that I have been referring to in the last five minutes is IT's fault, and there is a problem of IT not talking to the Centre for Teaching and Learning, for example, and I think there are conflicting problems. Because it is about the technology working, and that's IT's domain. So the teachers say give me wireless, and IT has got other things on."* (L6)

> *"… not always the necessary IT support for when it's not working. And when we really struggled, it was even worse, because there was no IT support on Tygerberg campus …"* (L1)

The fact that the dynamics in the classroom and the clinical environment (hospital) were different was mentioned by some participants. The clinical staff were not always fully aware of what they could expect when teaching in the classroom context.

> *"A lot of the technologies, almost on the university platform, we know there are resources available to help the clinicians, but it always seemed that there was a bit of a disconnect from the clinical teaching staff and the academic side, almost the integration of it … It's just from a clinical teacher perspective, I mean, I, from exposure, know where I can go and get most of those resources. But if you speak to a lot of other teaching staff, they are a little bit in the blind, or in the dark, as far as that goes. They're not always aware of what is available."* (L3)

This main theme reveals the different roles that need to be filled by the institution for effective blended learning implementation. The value of and need for faculty development as well as robust internet connectivity were highlighted. Clear communication channels to identify who is responsible for technical support was also emphasised by participants.

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4.8 CONCLUSION

Chapter 4 presented the findings of the research study, with five main themes and subthemes. It is clear from the findings that certain factors motivate teachers to implement a blended learning approach and others discourage the implementation. Pedagogical advantages include optimised contact time with students. Pedagogical approaches that allow self-paced learning and accessibility to access content any time anywhere were acknowledged by the majority of the participants and seemed to play a role in motivating implementation. However, certain factors discourage the implementation of a blended learning approach. The challenge of implementing digital technologies in the clinical learning environment due to the complex nature of HPE was one of the most frequently mentioned factors. Other factors include a lack of knowledge and skills to implement a blended learning approach, difficulty in changing set ways of teaching, the lack of communication regarding support structures and a lack of student participation. The interrelatedness of the themes and subthemes and how they answer the research question will be further interrogated in Chapter 5.

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CHAPTER 5:

DISCUSSION

5.1 INTRODUCTION

In this qualitative study, I sought to identify factors that influence MBChB teachers' decisions to implement a blended learning approach in their teaching and learning practices at Stellenbosch University. The findings of the interviews were presented in Chapter 4. The major findings that were outlined in the previous chapter are now considered against the relevant literature.

In answering the research question, five themes arose which indicated factors that influenced teachers to adopt a blended learning approach. The five major themes are the meaning-making of blended learning, the medical curriculum, teachers' individual differences, the medical student and institutional factors. Below follows a discussion of the findings according to the main themes.

5.2 MEANING-MAKING OF BLENDED LEARNING

An understanding of the advantages that blended learning could offer in the different learning environments was deemed important for participants to implement a blended learning approach. The learning environment in this setting includes the classroom and clinical learning opportunities, and the advantages of blended learning are evident in both environments. Among the advantages of blended learning that participants frequently referred to is the fact that it has the potential to engage students in active learning strategies (Bergmann & Sams, 2012; Prince, 2004). These advantages will be discussed in the context of the classroom and the clinical learning environment.

An approach that was often referred to in the classroom learning environment is the flipped classroom approach. Most participants appreciated the ability of a flipped classroom approach to prepare the student for the face-to-face sessions. Similar to Roehl et al. (2013) and Blair (2012), participants considered the flipped classroom approach advantageous in that it allows for more time in class for higher order, meaningful discussions. It is often stated in the literature

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that the flipped classroom approach can develop improved skills and competence (Hu et al., 2019). An additional advantage that participants found valuable in the classroom learning environment is the ability of blended learning activities to allow self-paced learning, giving the students more responsibility in their own learning process. Smyth et al. (2012) report similar findings and maintain that when students are given the opportunity to engage with content at any time, it gives them a sense of autonomy, which, according to literature, seems to be a factor that the 21st century student prefers (Mahan & Clinchot, 2014). Participants valued the flexibility that a blended learning approach offers students through self-paced learning and indicated that it allows students to achieve their learning outcomes (Lajoie & Gube, 2018).

It was interesting that participants mostly referred to the flipped classroom approach when implementing blended learning, because the literature points out many more advantages. For example, blended learning practices enable active learning in the classroom learning environment by making use of Google Docs and SurveyMonkey to facilitate interaction (George et al., 2013). There is improved participation and interaction between student-student and student-teacher. Additionally, Pizzi (2014) reports on the successful use of wikis for online collaboration between students which resulted in a stronger sense of community and social construction of their understanding.

The reason participants referred more to the flipped classroom approach might be that enormous emphasis is put on this approach to learning in the literature (Hu et al., 2019; Moffett, 2015; Sergis, Sampson & Pelliccione, 2017). The flipped classroom approach might be participants' only understanding and reference of how to implement digital technologies in the classroom learning environment.

Despite the advantages mentioned in the classroom learning environment, participants found it challenging to see how a blended learning approach could be advantageous in the clinical learning environment and they were of the opinion that more attention needs to be given to this notion in faculty development opportunities. However, some participants could see how the online component of blended learning could support their face-to-face teaching in the clinical learning environment. Similar to Chen, Lui and Martinelli (2017), participants found the flipped classroom approach valuable in developing students' critical thinking by preparing them to interact independently with the foundational concepts which students can apply in the face-to-face interactions when participating in critical thinking opportunities.

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However, compared to the literature there are additional advantages in the clinical learning environment such as the ability to facilitate clinical reasoning skills by means of digital technologies, which is often referred to throughout HPE as complex and challenging (Tan et al., 2010). Rowe (2013) reports on the effectiveness of a blended learning approach that offers opportunities which address complexities such as clinical reasoning and critical reflective thinking by making use of blogs, wikis and Google Docs. The lack of these innovative approaches in the clinical learning environment in this current study could point to participants' lack of technological pedagogical knowledge (Mishra & Koehler, 2006). Participants might not know the affordances of digital technologies in order to implement them in their teaching and this could hamper their creativity in the implementation process. Digital technologies such as blogs, wikis and Google Docs are not designed primarily for educational purposes, but according to literature, could assist in facilitating teaching practices (Rowe, 2013; Tan et al., 2010; Murphy, 2004).

A number of aspects influenced the participants' decision to adopt a blended learning approach in order for these advantages to materialise. The time required to upskill themselves and design blended learning materials was one of the major aspects. Most participants did not feel motivated to implement a blended learning approach due to their restricted time of being clinician teachers. These findings are similar to those in a literature review done by Doherty et al. (2018), who report that clinician teachers view time associated with blended learning as a barrier in their already time-restricted environment. Participants referred to time to develop, implement and master online learning tools as a barrier to implementation. This is consistent with other studies (Pettersson & Olofsson, 2015; Zibrowski, Weston & Goldszmidt, 2008) which indicated that clinicians had intentions to explore the use of technologies, but that the time and effort demotivated them.

It was clear that clinical teachers were hesitant to adopt a blended learning approach due to the additional time that would be added to their already full schedules. A general feeling among participants was that they were not given additional time to prepare blended learning materials or were not relieved from their clinical and teaching duties. These clinicians often work for the Department of Health and only do part-time work for the university, making it challenging to put time aside to design new materials or learn new teaching skills. This is in line with Perlman, Christner, Ross and Lypson (2014), who found that faculty members had to invest time to implement online learning and were not afforded administrative time. For the effective use of

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online tools, it is crucial that teachers be given time to familiarise themselves and engage with online tools. Several authors refer to the release of teachers from their teaching duties to develop content and to learn new technologies as support from the institution (Carbonell, Dailey-Hebert & Gijselaers, 2012; Doherty et al., 2018; Garrison & Vaughan, 2013; Wallace & Young, 2010). In the context of this study, however, this is not as feasible since many of the clinicians do not work for the university but rather for the Department of Health.

Clinicians' dual responsibilities and time associated with blended learning practices have been seen as a barrier to the adoption of a blended learning approach in higher education in several studies (Protsiv & Atkins, 2016; Doherty et al., 2018; Hamila & Embi, 2016). Similar to this current study, these factors can be seen to discourage teachers from implementing a blended learning approach. Time constraints are not unique to the health profession, but are a significant determining factor across HEIs (Protsiv & Atkins, 2016; Doherty et al., 2018). It could be argued that the clinician teacher's dual role as teacher and clinician places more responsibilities on them than the conventional teacher.

Despite the advantages of blended learning in both the classroom and clinical learning environment, time constraints in the HPE are generally related to the clinical context. The learning environments will be further discussed.

5.3 THE MEDICAL CURRICULUM

Participants had conflicting views of digital technologies in the clinical learning environment. In general, they found it challenging to see how blended learning could be implemented in a practical learning environment, such as the clinical area. This fits in with the research evidence indicating that blended learning is highly context-dependent and that its successful implementation might not be of value in all domains (Koehler, Mishra & Cain, 2017). However, similar to Rowe's findings (2013) that blended learning has the potential to enhance learning in the clinical context, one participant indicated the value of blended learning and referred to the use of digital technologies to develop students' clinical skills in order to apply them in the practical environment. The literature has reported that blended learning approaches lead to some measure of improvement in clinical skills such as history taking and clinical reasoning (Rowe, 2013).

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Participants referred more frequently to the clinical learning environment and whether they found blended learning to be useful in this environment. It is not surprising that they mentioned clinical learning more than classroom learning, because these participants were mainly clinicians by profession, and their focus was predominantly on the teaching that takes place in the clinical setting. The impression participants gave was that digital technologies are not useful in the clinical learning environment. The participants' perception of the usefulness of digital technologies could refer to aspects of TAM (Davis et al., 1989), which maintains that perceived usefulness determines attitude. Similar to Holden and Rada (2011), participants' perception of the usefulness of digital technologies evidently determined their attitude of acceptance or resistance regarding the implementation of a blended learning approach. Participants' failure to see the value and usefulness of digital technologies could refer to the fact that blended learning is still relatively novel in the clinical learning environment since there are limited studies available on the appropriateness of blended learning in a clinical learning environment (Rowe, 2013; Røe, Rowe, Ødegaard, Sylliaas, & Dahl-Michelsen, 2019). Garrison and Kanuka (2004) argue that exposing teachers to successful examples of blended learning courses might lead to the successful implementation of a blended learning approach. Studies that support this notion refer to authentic environments that expose the teacher to blended learning experiences (Herrington et al., 2014; Rowe, Bozalek & Frantz, 2013). Principles of authentic practice-based learning (Herrington & Oliver, 2000; Yardley et al., 2012) could result in opportunities for learning and professional development if teachers are exposed to relevant experiences. Clinician teachers might not have a sufficient frame of reference when implementing blended learning and might not be able to relate their teaching to good practice when attempting to implement digital technologies in the clinical learning environment; this influences their acceptance and implementation.

Another possible reason for participants' hesitance to implement blended learning could be their limited knowledge of how to implement it in a clinical learning environment. Teachers might have to be reminded of exactly what blended learning entails. It should be emphasised that the purpose of online learning and digital technologies is to complement face-to-face teaching (Garrison & Vaughan, 2008). In other words, digital technologies will not replace the practical aspect of learning in the presence of a patient, but are used to support face-to-face teaching and in this case to facilitate collaboration and reflection.

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The role of the clinician as a teacher and their daily clinical priorities further influence their decision to implement a blended learning approach. The findings suggest that participants identified primarily as being doctors/clinicians and not necessarily as teachers. This is similar to the study of Elmberger, Björck, Liljedahl, Nieminen and Laksov (2019), who found that their participants did not regard themselves as teachers because they lacked formal training in education. One of their participants mentioned that the "rules" of the education system were to have formal teaching training in order to be part of the educator community. It should be kept in mind that participants in this current study were clinicians by profession with full-time clinical responsibilities. While some participants did not identify as teachers, it could be argued that this could influence their priority to teach. Cantillon et al. (2019) reviewed the literature regarding a clinician teacher's identity and described individuals as having to juggle between professional roles. It was clear that participants in this current study conceptualised their teaching roles in different ways which influenced their teaching motivations and which role to prioritise. It seems that with time constraints, clinician teachers have to prioritise one of their roles over the other, which in general is their clinical roles when, in effect, teaching does not get priority. This aligns with Elmberger et al. (2019), who found that activities hold unequal value in their context. Juggling between activities means that time has to be divided between activities, creating tension between hospital duties and university activities (Cantillon, D'Eath, De Grave & Dornan, 2016).

Participants' primary identification with their role as doctors/clinicians rather than as teachers could be due to some influences that have been seen in the literature. Sethi et al. (2017) report several tensions and fears that could influence identity formation, such as losing clinician status, the bias of teachers as being undervalued and falling behind on health profession developments. These fears might assist in understanding why clinician teachers do not identify as teachers. The institution seems to have a significant influence on the teachers' identity (Lemaire et al., 2017) and it is suggested that faculty development can enhance and motivate clinician teachers to take on a teaching role (Cantillon et al., 2019). While SU already focuses on the professionalisation of the teaching role in faculty development programmes and accredited programmes such as the MPhil in HPE to develop teacher identities, further research might be needed to explore teachers' identities for a better understanding of their priorities and digital technology integration.

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5.4 TEACHERS' INDIVIDUAL DIFFERENCES

It is not surprising that most of the participants indicated a resistance to changing from a didactic teaching approach to a blended learning approach due to the disruptive nature of change. While some participants reflected an understanding of why change is needed, others found it challenging to move away from the familiar to the unfamiliar. These findings are similar to other studies which reported that teachers find change unsettling (McLean, 2003) and intruding (Rowe, 2013). Rowe explains that teachers can feel vulnerable and threatened and that they might feel that they are losing control when having to change their approach to teaching. Similar to the study of Doherty et al. (2018), participants felt overwhelmed and impatient in engaging with new tools, which influenced their attitude towards using digital technologies. A negative attitude towards change could relate to a negative attitude towards learning technologies and has been identified in other studies as a barrier to develop and implement online learning tools (Doherty et al., 2018).

The resistance to change that is evident in this study might stem from participants' personal pedagogical beliefs. A number of authors have reported on the relationship between a person's belief regarding the usefulness of technologies and how they approach their teaching practices (Hampton, 1994; Pajares, 1992; Kim et al., 2013). Kim et al. (2013) found that the relationship between pedagogical approaches to teaching and learning and teachers' choice to implement digital technologies is closely related to pedagogical beliefs. Existing beliefs and attitudes of teachers towards digital technologies might be a barrier in the implementation of a blended learning approach. Teachers' pedagogical beliefs might have to be considered in the facilitation of technology integration (Kim et al., 2013).

Institutions need to attempt to truly understand the resistance to change, and supportive management is vital. In return, management needs to clearly communicate and substantiate the rationale for change and demonstrate the value of changing pedagogical approaches. Taylor and Newton (cited in Owston, 2013) highlight the importance of supportive management in the process of change. Supportive management needs to challenge the teachers' vision and goals in order to align them with the institution's vision for teaching and learning. However, this might require teachers to put aside their own vision and beliefs about teaching and learning.

Additionally, resistance to change can be related to a lack of self-efficacy. Some aspects of Bandura's social cognitive theory (1986) can be drawn on. Participants often referred to not

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feeling confident in their own ability to use digital technologies in their teaching and learning practices. Similar to Anderson's findings (2012), participants related their lack of confidence (self-efficacy) to implement digital technologies to a lack of knowledge, skills and experience. Anderson (2012) argues that perceived level of self-efficacy plays a role in motivation to use technology. While self-efficacy was a significant factor in motivation, a lack of self-efficacy was a demotivating factor. It can be argued that digital literacy could influence confidence in the use of learning technologies. This is in line with work done by Abbitt (2011), who confirms that there is a relationship between teachers' knowledge and self-efficacy and their technology integration through exploring TPACK (Mishra & Koehler, 2006) and SCT (Bandura, 1986). Bandura's SCT suggests that increased knowledge will lead to increased self-efficacy, and therefore potentially lead to the increased use of digital technologies in teaching.

Based on these findings, the assumption can be made that knowledge and skills of digital technologies could influence self-efficacy and confidence to implement digital technologies in teaching practices.

5.5 THE MEDICAL STUDENT

The teachers' perception of the students and how they participate in blended learning activities was deemed important for teachers in order to implement a blended learning approach. A recent study investigating the 21st century students' learning preferences indicates that students prefer to work interactively in groups, they prefer teaching that takes on game-style learning and they prefer self-directed learning as opposed to lecture-style learning (Hopkins et al., 2018). The impression is that students would enjoy and prefer to learn with technologies. The literature also states that blended learning promotes student participation (Kenney & Newcombe, 2011; Smyth et al., 2012). However, the opposite was actually experienced in this study. Students reflected a lack of interest in and ability to participate in blended learning activities which seemed quite frustrating to most participants. Similar to Gray and Tobin (2010), participants realised that they could not assume that their students are familiar with technologies for educational purposes and that they are computer literate. Students' lack of enthusiasm could stem from several factors such as a lack of certain skills that are essential to participate successfully in a blended learning approach. Participants often referred to students lacking skills such as self-regulating and time management skills, which are required to participate and interact with the learning materials (Kenney & Newcombe, 2011; Alebaikan & Troudi, 2010;

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Heaney & Walker, 2012). Participants also reported that students' conception of learning and their ability to take responsibility for their learning were lacking. This, according to the literature, influences students' achievement in blended learning initiatives (Moore & Gilmartin, 2010; Smyth et al., 2012). Students need to understand that the responsibility for learning rests on them and is supported by SU's Teaching and Learning Policy (2018), which states that students must familiarise themselves with the SU approach to teaching and learning and making use of the learning opportunities that are available.

Considerations might be that teachers need to approach the online component of blended learning with more care. Sharpe, Benfield, Robert and Francis (2006) indicate that transparent communication regarding expectations is crucial for students to understand blended learning. Teachers also need to take on a new role as facilitator in which it is essential to create and nurture an online space where students feel confident to work independently (Smyth et al., 2012; Barr & Tagg, 1995). The new role of the teacher as facilitator means that the teacher is profoundly involved in scaffolding the learning process (Laurillard, 2012). This would include scaffolding students' development of learning with digital technologies and online navigation (McVeigh, 2009), but also in supporting the students in taking responsibility for their own learning.

5.6 INSTITUTIONAL FACTORS

In this current study faculty development opportunities appear to be a crucial factor in the implementation of a blended learning approach. Most participants reflected on their lack of technical knowledge and skills which, according to the literature, is the main challenge in the implementation process (Hamila & Embi, 2016; Alebaikan & Troudi, 2010; Kenney & Newcombe, 2010; Ramos et al., 2011). Similar to Sait et al. (2003), a lack of knowledge and skills influences teachers' delivery approaches and their willingness to adopt blended learning.

Participants often referred to attending faculty development opportunities but reported that it was challenging to implement digital technologies in their teaching practices and that they needed hands-on support. This might refer to a need for longitudinal support. Steinert et al. (2016) describe faculty development as not only taking on a one-time workshop format, but being a longitudinal intervention, including a mentor for one-to-one support. They assert that one of the key features of effective faculty development is relationship building. Therefore, faculty development should be followed by individual attention and support for the successful

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implementation of a blended learning approach. The importance of support and active involvement from the institution in blended learning curriculum development is highlighted in several studies (Hamila & Embi, 2016; Sarfo & Yidana; 2016).

Some of the data indicates that participants found it challenging to plan their teaching with digital technologies. Clinician teachers are normally not course designers. They are required to think about the content to include the type of knowledge that students are expected to have access to, the different types of skills that students need to learn, and the outcomes students should attain. Learning activities need to be designed and presented synchronously or asynchronously. Harden et al. (1984) suggest a guiding framework for curriculum design which could be applied in the design of blended learning practices. The SPICES model (Harden et al., 1984) suggests overarching components that need to be kept in mind when developing a blended learning curriculum. Other studies confirm that a framework could provide criteria and standards for curriculum development (Mirriahi, Alonzo & Fox, 2015) as well as support teachers in their skills development (Griffin, 2000). In the context of SU, the DeLTA framework (2013) could assist teachers in designing a curriculum that engages students in their learning. However, the unique context of HPE might require teachers to further unpack and adjust the DeLTA model to contextualise it for clinician teachers. Multiple faculty development opportunities are available at SU to encourage ongoing development. This creates a supportive climate for professional development (Stellenbosch University, 2018). The variety of documentation, guidelines, frameworks and faculty development opportunities that are available (discussed in Chapter 2) remain the responsibility of the FMHS to contextualise in order to meet the needs of the specific teachers. Pursuing faculty development opportunities and lifelong learning remains the teachers' decision, but could provide teachers with the necessary technical and pedagogical skills to provide quality education with digital technologies.

In order to implement a blended learning approach, essential institutional factors include not only faculty development, but also basics such as good internet connectivity. Participants reported that they were not motivated to implement digital technologies in their teaching due to the challenges they experienced such as slow internet connectivity. Connectivity challenges are not a new issue in teaching with digital technologies and have been an inherent problem reported in numerous studies (Sarfo & Yidana, 2016; Attardi & Rogers, 2015; Elias, 2010). It appears to be an issue in both developing and developed countries (Elias, 2010). At the FMHS,

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the reality is that there is no internet connection (Wi-Fi) in the hospital where clinical learning takes place, which was a major factor that participants reported as discouraging them from implementing learning technologies. However, it is essential to work around these challenges to achieve the learning outcomes and to still create a learning experience for the student. Faculty development needs to assist teachers in exploring and pursuing alternative teaching methods that may address challenges such as connectivity issues. Possibilities should include asynchronous activities, which means students are not bound to time and space in their learning process (Kitade, 2008). Asynchronous learning enables students to participate in online collaboration and communication and has other advantages such as providing students with more time to reflect on their responses and give thoughtful answers (Abrams, 2003).

Another institutional factor found in this study is clear communication channels between support staff, management and teachers, which is an important factor to implement a blended learning approach. Similar to Doherty et al. (2018), the lack of clear communication channels evidently influenced participants' attitude to implement digital technologies. Participants referred to clinical teaching staff, academic staff and support staff as working independently of each other, causing a lack of clear communication and leaving individuals unaware of the support roles in the faculty. Doherty et al. (2018) point out the need for technology-augmented teaching as a process that has to be adopted in polarisation and describe it as an interdepartmental process which includes communication and collaboration between teachers, support staff and management in order to ensure cohesive education and the successful adoption and implementation of blended learning.

The complexity of the learning environments might have contributed to the disconnect between the different role players. Clinician teachers at the FMHS teach in two different contexts, and might therefore not be fully aware of the infrastructure and support system. If they were full time at the university, they might have had time to become familiar with the system. One needs to keep in mind that both the clinical (hospital) and university context have their own support staff and the university cannot take responsibility for a lack of support and infrastructure in the hospital. It seems that communication channels need to be made clear across the institution in order to provide the support teachers need. Based on the findings, it could be argued that clear communication channels can result in participants feeling more supported by the institution (Lock & Johnson, 2017).

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5.7 CONCLUSION

In this chapter clinician teachers' experiences and understanding of blended learning were discussed and the influence that advantages and challenges related to blended learning implementation has on teachers' behaviour towards digital technologies was highlighted. It is evident that certain structures have to be in place in order to implement a blended learning approach successfully. Chapter 6 includes the limitations of the study, and recommendations and concluding remarks are made.

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CHAPTER 6:

CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

The main aim of the study was to investigate and identify factors that influence teachers' integration of a blended learning approach in their teaching. The objectives to support the study were to understand how teachers view blended learning and to explore what possible factors enhance or inhibit the implementation of a blended learning approach. This study aimed to answer the research question: What are the factors that influence MBChB teachers' integration of blended learning in their teaching?

This qualitative study revealed that a combination of behavioural, environmental and personal factors, as seen in Bandura's social cognitive theory (1986), influence behaviour to implement digital technologies. These include the teachers' meaning-making of blended learning, the medical curriculum, teachers' individual differences, the medical student and institutional factors. In Chapter 6, the most important conclusions drawn from the findings are discussed. The strengths, limitations and the recommendations of the study will also be presented.

6.2 CONCLUSION

The major findings of this study are that teachers' dual role as clinicians and teachers as well as the associated multiple responsibilities influence their behaviour in the implementation of a blended learning approach. Clinician teachers are primarily doctors by profession and did not necessarily sign up to be teachers; this could influence their priority to teach and explore associated pedagogical approaches. A responsibility towards professional development adds to the teachers' divided responsibilities as most clinician teachers are not trained primarily to teach. Professional development requires time, which affects developing in their role as teacher. Despite the fact that some teachers attend faculty development opportunities, or some have knowledge of teaching with digital technologies, they still fail to implement a blended learning approach due to their time-restricted environment. Clinician teachers have the intention to explore the use of digital technologies, but fail to do so because they have to juggle between professional roles and prioritise what is most important to them.

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It was also found that the learning environment plays a key role in a clinician teacher's implementation of a blended learning approach. Clinician teachers had different opinions about blended learning in the different learning environments and found it challenging to see the purpose of and need for a blended learning approach in the clinical learning environment. In this study I acknowledge that blended learning might not be as useful in one learning environment as it is in another, but I also recognise the possibilities it might hold for some clinical skills such as the development of clinical reasoning skills. Development opportunities might inform how digital technologies could be used in innovative ways to develop clinical skills such as critical thinking. While it is acknowledged that online learning will never replace the students' practical time with the patient, blended learning can facilitate complex, non-technical skills such as clinical reasoning, critical thinking and reflection. This might require clinician teachers to have knowledge of digital technologies and pedagogy and how they can be utilised to facilitate learning in various contexts.

Faculty development also plays an important role in the implementation of a blended learning approach. It was found that teachers need continuous support and development in the implementation process, which reflects on longitudinal faculty development opportunities. Faculty development seems to support and motivate teachers' process of development in their role as clinician teacher. Faculty development could also support clinician teachers in structuring blended learning practices, as it was found that clinician teachers found it challenging to do so.

6.3 RECOMMENDATIONS

The recommendations will be presented in two sections. The first are recommendations from this study. The second include opportunities for further research. The recommendations are intended to assist clinician teachers in the process of implementing a blended learning approach.

6.3.1 Recommendations from the study

Several recommendations are made based on the findings of this study:

- The study findings indicate that clinician teachers' dual role as clinicians and teachers, their multiple responsibilities and their limited time have an influence on their development as teachers. Supportive management needs to focus on professionalisation of the teacher role in an attempt to assist in developing them as teachers, as many

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clinician teachers do not necessarily see themselves as teachers but rather as doctors. Ongoing professional development of clinician teachers is essential where teachers are guided and mentored to implement a blended learning approach.

- Since the study findings indicate that clinician teachers lack knowledge of how blended learning could be implemented in the learning environments, it is recommended that teachers be exposed to successful examples of blended learning courses both in the clinical and classroom learning environments. Best practices need to be shared in the implementation process. Sessions could be considered where clinician teachers model possible ways in which blended learning could work in a clinical or classroom setting.
- The study findings indicate different opinions about blended learning in the different learning environments which could inform development opportunities. Faculty development opportunities need to be created in which the three learning domains (TPACK) (content knowledge, technology knowledge and pedagogical knowledge) are integrated so that they can be implemented in the unique context of HPE. Each teaching situation is different and it has to be emphasised that there is no one-size-fits-all technological solution that applies in the different learning environments.
- Faculty development should inform activities that facilitate clinical reasoning. It is recommended that institutions rethink development opportunities in order to focus on programmes that are contextualised specifically for the health professions context. These context-specific programmes should include alternative teaching methods in addressing factors such as connectivity in the different learning environments. They should also address the structure of blended learning by providing teachers with context-specific frameworks or guidelines to give them the scope to scaffold the process of digital technology integration in the MBChB curriculum.
- The study findings indicate that there is a need for technical and pedagogical support in the implementation process. Development and support are not separate entities and therefore it is recommended that faculty development not be only once-off workshops, but rather a longitudinal development process with follow-up opportunities for learning and support.
- Recognising that the lecturers that teach in the MBChB programme have dual roles to fulfil, the programme and faculty should seek to provide professional development opportunities that can support them as teachers.

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6.3.2 Recommendations for further research

In this study some suggestions have been made that can be explored in more depth:

- Further investigations can be made into how clinical learning can be enhanced by making use of digital technologies in innovative ways in the clinical learning environment.
- A deeper understanding of identities associated with teaching in a clinical context can be interrogated and developed.
- Research can be conducted into medical students' attitudes towards learning technologies and their participation in blended learning practices and how that might influence teachers' implementation of blended learning.

6.4 STRENGTHS AND LIMITATIONS OF THE STUDY

6.4.1 Strengths of the study

Identified strengths of the study include the collection of rich data, made possible by means of individual interviews. The interviews caused teachers to think critically about their teaching practice and use of digital technologies and enabled a more in-depth understanding of their blended learning implementation. Participants could speak openly about their experiences and concerns regarding the implementation of digital technologies in their respective learning environments.

The findings contribute to a better understanding of and insight into how teachers currently use digital technologies in their teaching and why some are reluctant to implement a blended learning approach. This study has explored theories in identifying behaviour and digital technology adoption which assisted in understanding teachers' decision-making process. It provides new insight into the clinician teachers' knowledge of blended learning and their perception of digital technologies in both the clinical and classroom learning environment. The study identifies advantages and challenges of digital technologies that clinician teachers experienced in their respective learning environments, which allowed me to make focused recommendations from the study.

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The findings of this study have implications for curriculum design within the FMHS and inform strategies and adjustments that can be made in Stellenbosch University's MBChB curriculum renewal process for sensible implementation of blended learning approaches. Suggestions are made on structures that have to be in place before approaching the adoption of blended learning. This study challenges and encourages faculties of medicine to rethink traditional teaching practices.

6.4.2 Limitations of the study

This study was limited to one module in one year group of the MBChB programme at the Faculty of Medicine and Health Sciences, SU.

Participants had some understanding of what blended learning entails but limited knowledge of how to implement a blended learning approach in the clinical learning environment, which could have influenced some of their responses. Nevertheless, participants were able to participate in the conversation, which added valuable insights into structures that have to be in place for future implementation.

Data collection was performed in 2019 before the World Health Organization declared COVID-19 a pandemic and discussions were written during the lockdown period. COVID-19 had an enormous influence on teachers and their teaching practices. Teachers were forced to rethink their teaching activities, interactions, communication and assessments on an online platform using digital technologies. New literature of how teachers implement digital technologies in teaching and learning is now available. It may be argued that the data in this study is slightly outdated even though it was generated in 2020, since teachers will approach teaching and learning with digital technologies completely differently after the COVID-19 pandemic.

6.5 REFLECTION

As a blended learning adviser at the Faculty of Medicine and Health Sciences, working within the Centre for Health Professions Education, Stellenbosch University, my MPhil studies started with the need to understand why some teachers do not use digital technologies with all the advantages they offer. Although I have been working at the institution for several years with teachers, I felt that I did not understand teachers' behaviour towards digital technologies and what internal and external factors influence their decision-making and behaviour. I only understood teachers' behaviour from an outsider's perspective. I thus needed to know how

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teachers perceive learning technologies in their respective environments, what their level of digital literacy is and what factors in both their environment and themselves influenced their behaviour towards digital technologies. To explore the factors that influence teachers' behaviour in the implementation of blended learning, I searched for literature that indicated factors that influence teachers' digital technology acceptance in other HEIs.

My major challenge was to find a suitable theory to understand human behaviour as well as digital technology adoption. I considered Fishbein's integrative behavioural model (IBM) which describes internal and external influences on behaviour. I decided not to use this model, because the different factors that influence behaviour in the IBM narrowed my thinking to only those factors. However, investigating the IBM gave me a better understanding of the theory that I ended up using, namely the theory of planned behaviour (TPB). IBM is, after all, an extension of the TPB. Additionally, Bandura's social cognitive theory seemed the most appropriate to explain human behaviour, which I chose as my overarching theory. Given that the study investigated teachers' behaviour towards digital technologies, it was necessary to include theories specifically used in studying technology acceptance. Besides the TPB, I also explored the technology acceptance model (TAM), which provides a framework that could indicate factors that influence individuals to adopt new technologies.

I decided on a qualitative research study as I was investigating human behaviour and needed a deeper understanding of teachers' decision-making and intentions to implement a blended learning approach. I needed a better understanding of teachers' reasoning and view of the world. Individual interviews helped me to delve deeper into the experiences of teachers and how they interpret these experiences.

Finally, in addition to my understanding of the research process that developed and my critical and analytical thinking, I have developed in my understanding and knowledge of blended learning. I have a better perception of the world of the clinician teacher and how they perceive teaching with digital technologies in their respective learning environments. I believe that this process of my own development will assist me in my position as blended learning advisor. I believe that I will be able to contribute to promoting blended learning in the FMHS.

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6.6 FINAL SUMMARY

The aim of this study was to investigate and identify factors that influence teachers' behaviour towards digital technologies and the implementation of a blended learning approach in their teaching practices within the MBChB curriculum. It answered the research question: What are the factors that influence MBChB teachers' integration of blended learning in their teaching?

This study has identified several interrelated factors, including the influence of clinician teachers' dual role as clinicians and teachers, the practical nature of the learning environment and the role of faculty development in supporting implementation and providing context-specific opportunities for development.

I hope that these findings will inform MBChB programme committees on how they could support the professional development of clinician teachers in their context-driven environments in order to take on the role of a teacher who accepts innovations such as a blended learning approach. Further debate might inform how teaching and learning practices could be adapted for the specific learning environments.

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APPENDIX A:

ETHICS APPROVAL CERTIFICATE FROM

STELLENBOSCH UNIVERSITY

UNIVERSITEIT
STELLENBOSCH
UNIVERSITY

Approval Notice

New Application

31/07/2019

Project ID :10039

HREC Reference #: S19/04/077

Title: Uncover factors that influence a group of MBChB lecturers to use Blended Learning in their teaching

Dear Miss Elizabeth Brits,

The **Response to Stipulations** received on 31/07/2019 07:55 was reviewed by members of **Health Research Ethics Committee 2 (HREC2)** via **expedited** review procedures on 31/07/2019 and was approved.

Please note the following information about your approved research protocol:

Protocol Approval Period: This project has approval for 12 months from the date of this letter.

Please remember to use your **Project ID [10039]** and **Ethics Reference Number [S19/04/077]** on any documents or correspondence with the HREC concerning your research protocol.

Please note that the HREC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

After Ethical Review

Please note you can submit your progress report through the online ethics application process, available at: Links Application Form Direct Link and the application should be submitted to the HREC before the year has expired. Please see *Forms and Instructions* on our HREC website (www.sun.ac.za/healthresearchethics) for guidance on how to submit a progress report.

The HREC will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly for an external audit.

Provincial and City of Cape Town Approval

Please note that for research at a primary or secondary healthcare facility, permission must still be obtained from the relevant authorities (Western Cape Departement of Health and/or City Health) to conduct the research as stated in the protocol. Please consult the Western Cape Government website for access to the online Health Research Approval Process, see: https://www.westerncape.gov.za/general-publication/health-research-approval-process. Research that will be conducted at any tertiary academic institution requires approval from the relevant hospital manager. Ethics approval is required BEFORE approval can be obtained from these health authorities.

We wish you the best as you conduct your research.

For standard HREC forms and instructions, please visit: Forms and Instructions on our HREC website https://applyethics.sun.ac.za/ProjectView/Index/10039

If you have any questions or need further assistance, please contact the HREC office at 021 938 9677.

Yours sincerely,

Mr. Francis Masiye,

HREC Coordinator,

Health Research Ethics Committee 2 (HREC2).

National Health Research Ethics Council (NHREC) Registration Number:

REC-130408-012 (HREC1)•REC-230208-010 (HREC2)

Federal Wide Assurance Number: 00001372
Office of Human Research Protections (OHRP) Institutional Review Board (IRB) Number:

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The Health Research Ethics Committee (HREC) complies with the SA National Health Act No. 61 of 2003 as it pertains to health research. The HREC abides by the ethical norms and principles for research, established by the World Medical Association (2013). Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects; the South African Department of Health (2006). Guidelines for Good Practice in the Conduct of Clinical Trials with Human Participants in South Africa (2nd edition); as well as the Department of Health (2015). Ethics in Health Research: Principles, Processes and Structures (2nd edition).

The Health Research Ethics Committee reviews research involving human subjects conducted or supported by the Department of Health and Human Services, or other federal departments or agencies that apply the Federal Policy for the Protection of Human Subjects to such research (United States Code of Federal Regulations Title 45 Part 45); and/or clinical investigations regulated by the Food and Drug Administration (FDA) of the Department of Health and Human Services.

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APPENDIX B:

INSTITUTIONAL CLEARANCE

INSTITUTIONAL PERMISSION:

AGREEMENT ON USE OF PERSONAL INFORMATION IN RESEARCH

Name of Researcher: Elizabeth Brits

Name of Research Project: Uncover factors that influence a group of MBChB lecturers to use Blended Learning in their teaching

Service Desk ID: IRPSD-1358

Date of Issue: 01 July 2019

The researchers have received institutional permission to proceed with this project as stipulated in the institutional permission application and within the conditions set out in this agreement.

1. WHAT THIS AGREEMENT IS ABOUT	
What is POPI?	1.1 POPI is the Protection of Personal Information Act 4 of 2013. 1.2 POPI regulates the entire information life cycle from collection, through use and storage and even the destruction of personal information.
Why is this important to us?	1.3 Even though POPI is important, it is not the primary motivation for this agreement. The privacy of our students and employees are important to us. We want to ensure that no research project poses any risks to their privacy. 1.4 However, you are required to familiarise yourself with, and comply with POPI in its entirety.
What is considered to be personal information?	1.5 'Personal information' means information relating to an identifiable, living individual or company, including, but not limited to: 1.5.1 information relating to the race, gender, sex, pregnancy, marital status, national, ethnic or social origin, colour, sexual orientation, age, physical or mental health, well-being, disability, religion, conscience, belief, culture, language and birth of the person; 1.5.2 information relating to the education or the medical, financial, criminal or employment history of the person; 1.5.3 any identifying number, symbol, e-mail address, physical address, telephone number, location information, online identifier or other particular assignment to the person; 1.5.4 the biometric information of the person; 1.5.5 the personal opinions, views or preferences of the person; 1.5.6 correspondence sent by the person that is implicitly or explicitly of a private or confidential nature or further correspondence that would reveal the contents of the original correspondence; 1.5.7 the views or opinions of another individual about the person; and

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	1.5.8 the name of the person if it appears with other personal information relating to the person or if the disclosure of the name itself would reveal information about a person.
Some personal information is more sensitive.	1.6 Some personal information is considered to be sensitive either because: 1.6.1 POPI has classified it as sensitive; 1.6.2 if the information is disclosed it can be used to defraud someone; or 1.6.3 the disclosure of the information will be embarrassing for the research subject. 1.7 The following personal information is considered particularly sensitive: 1.7.1 religious or philosophical beliefs; 1.7.2 race or ethnic origin; 1.7.3 trade union membership; 1.7.4 political persuasion; 1.7.5 health and health related documentation such as medical scheme documentation; 1.7.6 sex life; 1.7.7 biometric information; 1.7.8 criminal behaviour; 1.7.9 personal information of children under the age of 18; 1.7.10 financial information such as banking details, details relating to financial products such as insurance, pension funds or other investments.
2. COMMITMENT TO ETHICAL AND LEGAL RESEARCH PRACTICES	
You must commit to the use of ethical and legal research practices.	2.1 You must obtain ethical clearance before commencing with this study. 2.2 You commit to only employing ethical and legal research practices.
You must protect the privacy of your research subjects.	2.3 You undertake to protect the privacy of the research subjects throughout the project.
3. RESEARCH SUBJECT PARTICIPATION	
Personal information of identifiable research subjects must not be used without their consent.	3.1 Unless you have obtained a specific exemption for your research project, consent must be obtained from the research subject, before their personal information is gathered.
Research subjects must be able to withdraw from the research project.	3.2 Research subjects must always be able to withdraw from the research project (without any negative consequences) and to insist that you destroy their personal information.
Consent must be specific and informed.	3.3 Unless you have obtained a specific exemption for your research project, the consent must be specific and informed. Before giving consent, the research subject must be informed in writing of: 3.3.1 the purpose of the research; 3.3.2 what personal information about them will be collected (particularly sensitive personal information);

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	3.3.3 how the personal information will be collected (if not directly from them); 3.3.4 the specific purposes for which the personal information will be used; 3.3.5 what participation will entail (i.e. what the research subject will have to do); 3.3.6 whether the supply of the personal information is voluntary or mandatory for purposes of the research project; 3.3.7 who the personal information will be shared with; 3.3.8 how the personal information will be published; 3.3.9 the risks to participation (if any); 3.3.10 their rights to access, correct or object to the use of their personal information; 3.3.11 their right to withdraw from the research project; and 3.3.12 how these rights can be exercised.
Consent must be voluntary.	3.4 Participation in the research project must always be voluntary. You must never pressure of coerce subjects into participating and persons who choose not to participate must not be penalised.
Using the personal information of children?	3.5 A child is anybody under the age of 18. 3.6 Unless you have obtained a specific exemption in writing for your research project, you must obtain: 3.6.1 the consent of the child's parent or guardian; and 3.6.2 if the child is over the age of 7, the assent of the child, before collecting the child's information.
Research subjects have a right to access.	3.7 Research subjects have the right to access their information, obtain confirmation of what information is in your possession and who had access to the information. It is strongly recommended that you keep detailed records of access to the information.
Research subjects have a right to object.	3.8 Research subjects have the right to object to the use of their personal information. 3.9 Once they have objected, you are not permitted to use the personal information until the dispute has been resolved.
4. COLLECTING PERSONAL INFORMATION	
Only collect what is necessary.	4.1 You must not collect unnecessary or irrelevant personal information form research subjects.
Only collect accurate personal information.	4.2 You have an obligation to ensure that the personal information you collect is accurate. Particularly when you are collecting it from a source other than the research subject. 4.3 If you have any reason to doubt the quality of the personal information you must verify or validate the personal information before you use it.
5. USING PERSONAL INFORMATION	
Only use the personal information for the purpose for which you collected it.	5.1 Only use the personal information for the purpose for which you collected it.

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	5.2 If your research project requires you to use the personal information for a materially different purpose than the one communicated to the research subject, you must inform the research subjects and Stellenbosch University of this and give participants the option to withdraw from the research project.
Be careful when you share personal information.	5.3 Never share personal information with third parties without making sure that they will also follow these rules. 5.4 Always conclude a non-disclosure agreement with the third parties. 5.5 Ensure that you transfer the personal information securely.
Personal information must be anonymous whenever possible.	5.6 If the research subject's identity is not relevant for the aims of the research project, the personal information must not be identifiable. In other words, the personal information must be anonymous (de-identified).
Pseudonyms must be used whenever possible.	5.7 If the research subject's identity is relevant for the aims of the research project or is required to co-ordinate, for example, interviews, names and other identifiers such as ID or student numbers must be collected and stored separately from the rest of the research data and research publications. In other words, only you must be able to identify the research subject.
Publication of research	5.8 The identity of your research subjects should not be revealed in any publication. 5.9 In the event that your research project requires that the identity of your research subjects must be revealed, you must apply for an exemption from this rule.
6. SECURING PERSONAL INFORMATION	
You are responsible for the confidentiality and security of the personal information.	6.1 Information must always be handled in the strictest confidence. 6.2 You must ensure the integrity and security of the information in your possession or under your control by taking appropriate and reasonable technical and organisational measures to prevent: 6.2.1 loss of, damage to or unauthorised destruction of information; and 6.2.2 unlawful access to or processing of information. 6.3 This means that you must take reasonable measures to: 6.3.1 identify all reasonably foreseeable internal and external risks to personal information in your possession or under your control; 6.3.2 establish and maintain appropriate safeguards against the risks identified; 6.3.3 regularly verify that the safeguards are effectively implemented; and 6.3.4 ensure that the safeguards are continually updated in response to new risks or deficiencies in previously implemented safeguards.
Sensitive personal information requires extra care.	6.4 You will be expected to implement additional controls in order to secure sensitive personal information.
Are you sending any personal information overseas?	6.5 If you are sending personal information overseas, you have to make sure that: 6.5.1 the information will be protected by the laws of that country; 6.5.2 the company or institution to who you are sending have agreed to keep the information confidential, secure and to not use it for any other purpose; or 6.5.3 get the specific and informed consent of the research subject to send the information to a country which does not have data protection laws.

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Be careful when you use cloud storage.	6.6 Be careful when storing personal information in a cloud. Many clouds are hosted on servers outside of South Africa in countries that do not protect personal information to the same extent as South Africa. The primary example of this is the United States. 6.7 It is strongly recommended that you use hosting companies who house their servers in South Africa. 6.8 If it is not possible, you must ensure that the hosting company agrees to protect the personal information to the same extent as South Africa.
7. RETENTION AND DESTRUCTION OF PERSONAL INFORMATION	
You are not entitled to retain personal information when you no longer need it for the purposes of the research project.	7.1 Personal information must not be retained beyond the purpose of the research project, unless you have a legal or other justification for retaining the information.
If personal information is retained, you must make sure it remains confidential.	7.2 If you do need to retain the personal information, you must assess whether: 7.2.1 the records can be de-identified; and/or whether 7.2.2 you have to keep all the personal information. 7.3 You must ensure that the personal information which you retain remains confidential, secure and is only used for the purposes for which it was collected.
8. INFORMATION BREACH PROCEDURE	
In the event of an information breach you must notify us immediately.	8.1 If there are reasonable grounds to believe that the personal information in your possession or under your control has been accessed by any unauthorised person or has been disclosed, you must notify us immediately. 8.2 We will notify the research subjects in order to enable them to take measures to contain the impact of the breach.
This is the procedure you must follow.	8.3 You must follow the following procedure: 8.3.1 contact the Division for Institutional Research and Planning at 021 808 9385 and permission@sun.ac.za; 8.3.2 you will then be required to complete the information breach report form which is attached as Annexure A. 8.4 You are required to inform us of a information breach within 24 hours. Ensure that you have access to the required information.
9. MONITORING	
You may be audited.	9.1 We reserve the right to audit your research practices to assess whether you are complying with this agreement. 9.2 You are required to give full co-operation during the auditing process. 9.3 We may also request to review: 9.3.1 forms (or other information gathering methods) and notifications to research subjects, as referred to in clause 3; 9.3.2 non-disclosure agreements with third parties with whom the personal information is being shared, as referred to in clause 5.4; 9.3.3 agreements with foreign companies or institutes with whom the personal information is being shared, as referred to in clause 6.5.

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10. CHANGES TO RESEARCH	
You need to notify us if any aspect of your collection or use of personal information changes.	10.1 You must notify us in writing if any aspect of your collection or use of personal information changes (e.g. such as your research methodology, recruitment strategy or the purpose for which you used the research). 10.2 We may review and require amendments to the proposed changes to ensure compliance with this agreement. 10.3 The notification must be sent to permission@sun.ac.za.
11. CONSEQUENCES OF BREACH	
What are the consequences of breaching this agreement?	11.1 If you do not comply with this agreement, we may take disciplinary action or report such a breach to your home institute. 11.2 You may be found guilty of research misconduct and may be censured in accordance with Stellenbosch University or home institute's disciplinary code.
You may have to compensate us in the event of any legal action.	11.3 Non-compliance with this agreement could also lead to claims against Stellenbosch University in terms of POPI and/or other laws. 11.4 Unless you are employed by or studying at Stellenbosch University, you indemnify Stellenbosch University against any claims (including all legal fees) from research subjects or any regulatory authority which are the result of your research project. You may also be held liable for the harm to your reputation should there be an information breach as a result of your non-compliance with this agreement.
12. CONTACT US	
Please contact us if you have any questions.	Should you have any questions relating to this agreement you should contact permission@sun.ac.za.

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Annexure 'A'

Instruction:

Please send this Notice to permission@sun.ac.za. If you have any difficulty completing the Notice, please contact the Division for Institutional Research and Planning at 021 808 9385. You must confirm that the Notice was received.

NOTIFICATION OF INFORMATION BREACH

Name of Researcher: .....

Name of Research Project: .....

Service Desk ID: .....

A security breach happens when you know (or you reasonably believe) that there has been:

a) loss of Personal Information ("PI")
b) damage to PI
c) unauthorised destruction of PI
d) unauthorised access to PI
e) unauthorised processing of PI

Date and time of security breach:	
Brief description of the security breach (what was lost and how). Please identify the equipment, software and/or physical premises and whether it is by hacking, lost device, public disclosure (email), theft or other means:	
Name the person/s responsible for the security breach (if known):	
Is the security breach ongoing?	
Describe the steps taken to contain the security breach:	
What steps are being taken to investigate the cause of the breach?	

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APPENDIX C:

PARTICIPANT INFORMATION LEAFLET

AND CONSENT FORM

TITLE OF RESEARCH PROJECT:	
Uncover factors that influence a group of MBChB lecturers to use Blended Learning in their teaching	
DETAILS OF PRINCIPAL INVESTIGATOR (PI):	
Title, first name, surname: Ms Elizabeth Brits	**Ethics reference number:** **10039**
Full postal address: Centre for Health Professions Education (CHPE) Faculty of Medicine and Health Sciences Stellenbosch University PO Box 241 Cape Town, 8000	**PI Contact number:** **079 164 8458**

We would like to invite you to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study staff or doctor any questions about any part of this project that you do not fully understand. It is very important that you are completely satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary**, and you are free to decline to participate. In other words, you may choose to take part, or you may choose not to take part. Nothing bad will come of it if you say no: it will not affect you negatively in any way whatsoever. Refusal to participate will involve no penalty or loss of benefits or reduction in the level of care to which you are otherwise entitled to. You are also free to withdraw from the study at any point, even if you do agree to take part initially.

This study is performed as a requirement for the degree of Master of Philosophy (MPhil) in Health Professions Education, offered by the Centre for Health Professions Education at the Faculty of Medicine and Health Sciences of Stellenbosch University, for which the researcher is enrolled. This study has been approved by the Health Research Ethics Committee at Stellenbosch University. The study will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, the South African Guidelines for Good Clinical Practice (2006), the Medical Research Council (MRC) Ethical Guidelines for Research (2002), and the Department of Health Ethics in Health Research: Principles, Processes and Studies (2015).

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What is this research study all about?

- *This research study aims to identify the factors that influence lecturers' use of Blended Learning in their teaching. The reason for the study is to find out why some lecturers don't use technology in their teaching and to find possible solutions to assist/empower lecturers to make use of technology.*
- *The 10 Module Chairpersons for the Early Clinical Rotation phase were selected to participate in the study.*

Why do we invite you to participate?

- *You were invited because you are one of the 10 Module Chairpersons that teaches in the MBChB programme in year 3 in the Early Clinical Rotations.*

What will your responsibilities be?

- *You will attend an interview of approximately one hour in duration.*
- *Your responsibility will be to give honest reflections on guided questions.*

Will you benefit from taking part in this research?

- *The results from this research could contribute to better understanding and give insight into why lecturers do or don't implement blended learning approaches. Findings could inform the MBChB curriculum Committee in the programme renewal process where adjustments need to be made for better integration of blended learning approaches.*

Are there any risks involved in your taking part in this research?

- *No risks are expected with participation in this study. All interview recordings and transcripts will be confidential and saved on a password-protected computer.*
- *Personal information will be kept confidential and personal identifiers will be removed. Audio recordings will be deleted after member checking.*

If you do not agree to take part, what alternatives do you have?

- *You can decline to participate in this research, or you can stop participating in this research at any time with no negative consequence.*

Who will have access to your records?

- *I will have sole access to audio data and transcripts. Your data collected will be stored on a password-protected computer of which only I as the researcher will have access to. Personal information will be kept confidential. All personal identifiers will be removed. Audio recordings will be deleted after member checking.*

Even though it is unlikely, what will happen if you get injured somehow because you took part in this research study?

- *As this research involves only interviews, injury is unlikely to occur.*

Will you be paid to take part in this study and are there any costs involved?

- *No payment will be involved in this study. As interviews will be conducted at a time and place suitable for you, no costs will be involved. Refreshments will be served as a sign of appreciation for your time and input.*

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Is there anything else that you should know or do?

- *You can phone Ms E Brits at 079 164 8458 if you have any further queries or encounter any problems.*
- *You can phone the Health Research Ethics Committee at 021 938 9677/9819 if there still is something that your study doctor has not explained to you, or if you have a complaint.*
- *You will receive a copy of this information and consent form for you to keep safe.*

Declaration by participant

By signing below, I ……..……. agree to take part in a research study entitled:
Uncover factors that influence a group of MBChB lecturers to use Blended Learning in their teaching

I declare that:

- I have read this information and consent form, or it was read to me, and it is written in a language in which I am fluent and with which I am comfortable.
- I have had a chance to ask questions and I am satisfied that all my questions have been answered.
- I understand that taking part in this study is **voluntary,** and I have not been pressurised to take part.
- I may choose to leave the study at any time and nothing bad will come of it – I will not be penalised or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the study doctor or researcher feels it is in my best interests, or if I do not follow the study plan that we have agreed on.

Signed at (*place*) ..... on (*date*) ..... 2019.

....
Signature of participant **Signature of witness**

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Declaration by investigator

I *(name)* ..... declare that:

- I explained the information in this document in a simple and clear manner to .....
- I encouraged him/her to ask questions and took enough time to answer them.
- I am satisfied that he/she completely understands all aspects of the research, as discussed above.
- I did/did not use an interpreter. (*If an interpreter is used then the interpreter must sign the declaration below.)*

Signed at (*place*) ..... on (*date*) ..... 2019.

....

Signature of investigator **Signature of witness**

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APPENDIX D:

EMAIL INVITATION

Subject: Invitation to participate in a research project

Dear Sir or Madam,

My name is Kanita Brits and I am a Master's in Philosophy student in Health Professions Education at the Faculty for Medicine and Health Sciences, Stellenbosch University. I am working on a research project under the supervision of Dr. Elize Archer and Dr. Sonja Strydom.

I am writing to you today to invite you to participate in a study entitled "Uncover factors that influence a group of MBChB lecturers to use Blended Learning in their teaching". This study aims understand and identify factors that influence lecturers' integration of blended learning (technology) in teaching and learning.

This study involves one 60 minute interview that will take place in a mutually convenient, safe location. With your consent, interviews will be audio-recorded. Once the recording has been transcribed, the audio-recording will be destroyed.

Care will be taken to protect your identity. This will be done by keeping all responses anonymous and allowing you to request that certain responses not be included in the final project.

You will have the right to end your participation in the study at any time, for any reason. If you choose to withdraw, all the information you have provided will be destroyed.

As a token of appreciation, I will be providing you with refreshments during the interview.

All research data, including audio-recordings and any notes will be encrypted. Any hard copies of data (including any handwritten notes or USB keys) will be kept in a locked cabinet at the Tygerberg campus. Research data will only be accessible by the researcher and the research supervisors.

(The ethics protocol for this project was reviewed by the Health Research Ethics Committee at the Faculty of Medicine and Health Science (FMHS), SU, which provided clearance to carry out the research.)

If you have any ethical concerns with the study, please contact the Health Research Ethics Committee at 021 938 9677. You are welcome to contact me with any further questions.

Sincerely,

Kanita Brits

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APPENDIX E:

INTERVIEW GUIDE

(Total interview time should not exceed 60 minutes)

Interview Guide: This is just a guide. The interviewer will aim to get appropriate information from each participant. Not all questions may be necessary and additional follow-up questions may be asked to clarify or expand answers given.

1. What do you understand the concept of blended learning?
2. How comfortable do you feel using technology?
3. How do you feel about *teaching* with technologies?
4. How have you/ would you implement(ed) blended learning in your context?
5. Tell me about your experience using the University's Learning Management System (SunLearn) and creating content on this platform.
6. What would encourage you to implement a blended learning approach?