When UTAUT2 meets design thinking mindset: Exploring e-learning champions' adoption of blended learning at EMU[1]

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Abstract

Blended learning has increasingly been recognised as an effective approach to enhance student success in higher education, and to make this possible, educational technologies are crucial. Despite significant improvements to ICT infrastructure, staff training programs and help desk support, uptake differs considerably across contexts (Mohan et al., 2020) and scholars (Sherman & Howard, 2012; Taherdoost, 2018) suggest that motivation is at the core of technology acceptance. This study seeks to understand the factors motivating lecturers to accept blended learning at Eduardo Mondlane University (EMU) in Mozambique, by following a group of three lecturers who have been thriving in adopting blended learning and are eager to support others in their adoption of blended learning as well, designated in the study as "blended learning champions".

The study was initially framed by the unified theory of acceptance and use of technology (UTAUT2) - a model[2] that, through a combination of constructs such as performance expectancy, social influence, and facilitating conditions, has been used to understand factors influencing an individual's acceptance and use of technology (Venkatesh et al., 2012). Historically, using theories such as UTAUT2, technology acceptance has been understood through statistical analysis of large quantitative data sets. However, this study focuses on the stories told by three "blended learning champions" drawing from qualitative in-depth interviews. Using participatory action techniques (Bozalek & Biersteker, 2010), such as Rivers of Life and Community Mapping over six individual interviews and a focus group, I elicited detailed narrative data, which appeared to go beyond the UTAUT2 model. Thematic analysis was employed to identify key patterns and insights from this qualitative data. Thus, later, I turned to research on design thinking mindsets (Gachago et al., 2017), which looks at characteristics of people that help them approach problems in unique and innovative ways, such as empathy, curiosity, collaborativeness and others.

[2] Although in the context of this study I understand it more as a model, I use 'model' and 'theory' interchangeably, following the same approach as the main authors referenced in the study.

The study shows that for these blended learning champions, the availability of ICT infrastructure, training, helpdesk support and so on are, as expected, *Facilitating Conditions*. However, what is interesting is that, when faced with challenges, blended learning champions tend first to look inward for solutions. The study also reveals that they are well aware that adopting new technologies and methodologies will be challenging, which is why, in terms of *Effort expectancy*, they engage with one problem at a time. Moreover, blended learning champions also feel confident that, by gradually adopting blended learning, their performance will improve (*Performance expectancy*), while, at the same time, improving their work-life balance. Blended learning champions understand that experimenting and failing are part of the learning process. Unlike most studies with UTAUT2, *Social influence* was found to have less impact; these blended learning champions feel unburdened by peer pressure and generally feel comfortable whenever they do not know what to do or commit mistakes while using technology. All of these are elements of a design thinking mindset or culture.

This research contributes to a local understanding of the factors motivating lecturers' uptake of blended learning. Thus, to boost blended learning uptake, institutions should not only focus on *Facilitating Conditions* such as technological infrastructure and staff training, but also create a less pressured and more empathetic environment where lectures feel at ease with what they do not know, are presented with a modest but steady adoption process, and where educational technologies contribute to the improvement of their work-life balance. As such, the study confirms the theory underpinning the design thinking mindset in relation to what motivates the blended learning champions, and this contributes to creating a bridge between design thinking and technology acceptance research. Finally, the study has highlighted the importance of the individual context in UTAUT2 research. How to create such a culture in the current climate of a neoliberal university remains an important question, which might be a topic of further research.

Keywords: blended learning, educational technology, technology acceptance, design thinking, higher education

Dedication

To my wife, Johar Mucussete, children Imran Jafar and Rossana Issufo, and my mother, Jamila Issufo: Your unwavering support and boundless love have been my guiding light. If not for you, I would not have understood the essence of a purposeful life. This journey and every page written herein is a testament to your enduring influence in my life.

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This dissertation is not only a reflection of my academic endeavours but also a tribute to those who have supported and guided me through this journey.

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To all of you, I extend my deepest gratitude. Your collective wisdom, support, and belief in my abilities have been the pillars of my success. This dissertation is as much your achievement as it is mine.

Plagiarism Declaration

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Signature: Vali Yafar Issufo Date: January 2024

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List of Abbreviations and Acronyms

BI	Behavioural Intention
DT	Design Thinking
DTM	Design Thinking Mindset
EdTEch	Educational Technology
EE	Effort Expectancy
EMU	Eduardo Mondlane University
FC	*facilitating conditions*
HE	Higher Education
ICT	Information and Communication Technologies
IS	Information System
LMS	Learning Management System
PE	Performance Expectancy
PLA	Participatory Learning and Action
PV	Price Value
SI	Social Influence
SIDA	Swedish Government Agency for Development Cooperation
STEM	Science, Technology, Engineering, and Mathematics
TAR	Technology Acceptance Research
TIC-EID	Department for ICTs in Education Research and Development
TL	Teaching and Learning
TTF	Task Technology Fit
UCT	University of Cape Town
UB	Use Behaviour
UTAUT	Unified Theory of Acceptance and Use of Technology
UTAUT2	Extended Unified Theory of Acceptance and Use of Technology

Chapter 1: Introduction

Blended learning combines online with traditional classroom teaching and learning. It necessitates the physical presence of both lecturer and student, with some element of student control over time, place, path, or pace (Anthony et al., 2022). In the evolving landscape of Higher Education (HE), blended learning is increasingly seen as an important adaptation to the changing demands of the workforce and the diversification of student needs, since it harmonises the depth of traditional learning with the flexibility of online modalities, creating a richer educational experience (Anthony et al., 2022; Ozkan Bekiroglu et al., 2022). Alternative education pathways, characterised by a blend of in-person and online learning, appear to be becoming more widespread, as pointed out by the EDUCAUSE (2021) report: blended learning is becoming increasingly crucial as the HE sector faces reduced funding and a heightened focus on future work skills. Resources are, thus, being channelled towards technologies that facilitate these innovative teaching and learning models, supporting the assertion that blended learning is growing in significance within HE. Hennessy et al. (2022) add that it is imperative to approach this transition thoughtfully, ensuring that the adoption of blended learning is not solely driven by financial or external pressures, but is rooted in a genuine commitment to enhancing student learning experiences and outcomes.

Resources are, therefore, being channelled towards technologies that facilitate these innovative teaching and learning models. This investment reflects a broader recognition of the growing significance of blended learning within the HE landscape, supporting the assertion that it is more than just a trend but a pivotal element in shaping future education.

Research Context

This research is rooted in the academic environment of Eduardo Mondlane University (EMU), specifically within the Engineering Faculty. As the oldest and most established university in Mozambique, EMU is a pivotal institution for pioneering educational strategies and serves as a benchmark for technological integration in

higher education across the country (EMU, 2017). The Engineering Faculty, with its intrinsic connection to technological progress and innovation, represents an ideal microcosm for studying the implementation and adoption of blended learning methodologies.

Mozambique's higher education, led by Eduardo Mondlane University (EMU), has developed through significant socio-political changes since independence, in 1975. Established in 1962 as the University of Lourenço Marques and renamed in 1976, EMU has been central to educational reform and development. The university's journey reflects the broader socio-political challenges faced by Mozambique, from post-independence nation-building to enduring efforts to overcome constraints imposed by civil conflict and economic hardship (Taimo, 2019).

Despite progress, the higher education sector continues to face challenges, including resource limitations and disparities in digital literacy, which impact the adoption of educational technologies, the focus of this study. UEM's ongoing commitment to expanding access through provincial campuses and distance education programs is evidence of its role in addressing these challenges and supporting educational innovation within the country's complex socio-political landscape.

In line with global educational trends, EMU has placed a strategic emphasis on blended learning and the adoption of technology for teaching and learning (EMU, 2017). Historical initiatives, documented as early as 2005 by Muianga et al., laid the groundwork for a structured approach to integrating technology into the university's pedagogical practices as did Pridmore and Yates (2005) and Mendonça et al. (2012) who have all underscored EMU's proactive stance on enhancing students' access to information and communication technologies (ICT). From the outset, EMU's greatest concern was ensuring that all students, irrespective of their socio-economic backgrounds and digital literacy skills, had equitable access to ICT resources. This commitment was manifested in several key measures, such as establishing computer labs, introducing internet facilities on campus, and incorporating ICT literacy into the curriculum. These foundational steps were essential in building a conducive

environment for blended learning, which relies heavily on students' ability to interact with digital platforms both within and outside the traditional classroom setting.

The EdTech Project

Building on EMU's foundational efforts to improve student access to information and communication technologies, the EdTech project was launched in 2018 and represented the next significant leap in the university's pedagogical evolution. The project, initially with a timeline spanning from 2018 to 2022 and then extended to 2025 due to the COVID-19 pandemic, is a testament to EMU's resilience and adaptability in the face of global challenges. With an allocation of 25 million Swedish krona, the project underscores a major investment in the university's future capabilities to integrate technologies for teaching and learning as well as conducting and disseminating high-quality research. This is manifested in the activities of the following projects, to name a few:

- Funding for one Doctoral student in educational technologies researching the translation of integration practices of educational technologies from the classroom to the university’s curricula.
- Funding for four Masters students researching the various facets of educational technologies at EMU, from the results and impact of lecturer training, gamification, gender equity and barriers and enabling factors for the adoption of educational technologies.
- Design and rollout of a seven-week-long Design for Blended Learning course.
- Design and rollout of two specialised workshops for lecturers and researchers on the subjects of online facilitation and technology integration in the classroom.
- Organisation of an annual Teaching with Technology Day (held for the third time this year) aiming to increase awareness through the sharing of educational technology practices, demonstrations and debate.
- The establishment of an advanced multimedia lab to be used by lecturers and researchers for developing rich multimedia content.

The EdTech project endeavours included the creation of a model for staff development in educational technologies, the modernisation of the university's ICT infrastructure and the establishment of TIC-EID, a multidisciplinary unit, to institutionalise ICT-based teaching and research.

The Department for ICTs in Education, Research, and Development (TIC-EID) serves as a vital organ within the EdTech project at Eduardo Mondlane University, bridging the historical commitment to improving technological access and the contemporary drive towards educational innovation. As a specialised unit, TIC-EID embodies the university's determination to align technical decisions with academic needs, thereby ensuring the academic community's effective use of ICTs in research and teaching. It plays a crucial role in mitigating the divide between "engineers" and "academics," fostering an environment where interdisciplinary collaboration is the norm (EMU, 2017).

Pedagogical Innovation in the EdTech Project

The EdTech project at EMU foregrounds pedagogical innovation, leveraging digital tools to foster the integration of new methodologies into research, teaching, and learning. This approach heralds a shift in the university's educational paradigm, aiming to position EMU at the forefront of contemporary educational practices. The initiative's novelty lies in its pedagogical focus, which is evidenced in the training of lecturers and researchers in educational technology use and its pedagogical application.

In parallel with continuous investment in enabling ICT infrastructure and platforms, these activities have been carried out since 2018 with a university-wide scope, with many of them already established as part of the university’s academic life.

Rationale

Despite strategic investments aimed at overcoming technological barriers and improving the research and innovation environment at UEM, the uptake of blended learning technologies remains significantly below expectations. UEM's annual reports from 2021, 2022, and 2023 consistently highlight the ongoing need for increased

support for both lecturers and students in effectively utilising blended learning. These reports highlight the fact that, while infrastructure and resources have been improved, there is still a substantial gap in adoption and proficiency, necessitating further interventions to enhance the integration of educational technologies. This persistent need for support suggests that the barriers to adoption are more complex than initially anticipated, aligning with broader trends observed in similar educational contexts (Muianga et al., 2019; Bervell et al., 2021). These findings underscore the need for a deeper investigation into the motivational and contextual factors that influence technology adoption at EMU.

At EMU, the slow uptake of blended learning technologies is similarly observed: despite consistent investments aimed at overcoming technological barriers, it is recognised by the university's leadership that the level of adoption does not meet the expectations set out in EMU's 10-Year Strategic Plan, which prioritises the improvement of the research and innovation environment through an enabling institutional and research infrastructure (EMU, 2017). Faculties and schools often cite issues, such as inadequate internet or insufficient devices, as primary obstacles; however, the gradual and strategic investments in these areas, particularly through initiatives like the EdTech project, should have substantially mitigated these concerns. Nevertheless, the expected surge in adoption has not materialised. This phenomenon is supported by observational evidence from the TIC-EID unit, which monitors technical support and the use of technology for teaching, learning, and research.

Nonetheless, a distinct subset of lecturers remains highly engaged with adopting blended learning, some of whom did not even participate in the formal training programs, indicating that barriers to technology integration may be more complex and multifaceted than the availability of resources and support alone. In the everyday dialogues within technical support teams and strategic meetings across faculties and schools at EMU, the names of certain lecturers, who consistently engage with blended learning, surface repeatedly, not as seekers of routine assistance but as innovators who are pushing the boundaries of what is possible with educational

technology at EMU. These lecturers navigate through the same technological and institutional landscape but seem to chart a more effective course, suggesting that their success may be less about the tools and more about how they perceive, engage with, and respond to these challenges.

The primary aim of this research is to uncover the identities and narratives of these lecturers. Who are they? What distinctive practices are they employing, and what drives them to integrate technology in their teaching so effectively? This investigation seeks to delve into the motivations, attitudes, and behaviours that set these educators apart, aiming to understand the essence of their success in fostering a blended learning environment.

By recognising and understanding the characteristics and motivations of these lecturers, this research aspires to inform strategic decision-making at EMU. The goal is to extract insights that can guide the university in creating a supportive environment that encourages more educators to adopt such an approach. In doing so, the institution can move towards a collective transformation, where innovative pedagogical practices are not the exception but the norm, ultimately enhancing the quality and reach of its educational programs.

Research Problem and Question

The theoretical underpinning of this study lies within technology acceptance research (TAR), a theoretical lens used to examine the reasons that users accept or reject information systems (Venkatesh et al., 2012). TAR is instrumental in shedding light on the complex interplay between human behaviour and technology use which is also the case in educational settings, where the adoption of new technologies is often met with varying levels of resistance and enthusiasm (Alhramelah & Alshahrani, 2020; Anthony et al., 2022).

For this study, technology acceptance research (TAR) is critical, as it provides a theoretical basis for understanding the factors that influence lecturers' acceptance and use of blended learning technologies. TAR models help explain the dynamics of technology integration in teaching practices, shedding light on the intricate balance of

external facilitators and internal predispositions that contribute to the successful adoption of educational technologies. In the pursuit of this goal, a review of various TAR frameworks was conducted, including prominent models such as the technology acceptance model and the diffusion of innovation theory, as mentioned in studies like those by Francom (2020) and Gachago et al. (2017). The unified theory of acceptance and use of technology 2 (UTAUT2), proposed by Venkatesh et al. (2012), however, was selected for its comprehensive nature and the incorporation of specific constructs that are deemed highly relevant for the context of this study—specifically its emphasis on the *social influence* and *facilitating conditions* for technology acceptance, which are hypothesised to play a significant role in the blended learning adoption phenomena at EMU.

However, the application of the UTAUT2 framework in this research presents a unique set of challenges due to the specific focus on a minority of teaching staff at Eduardo Mondlane University. These individuals are identified as possibly unique in their contexts, showing a notable inclination towards adopting blended learning, which they appear to perceive as necessary. They have distinguished themselves by not only adopting, but thriving in their use of, blended learning technologies, even as they confront the same barriers that have hindered broader faculty engagement.

This scenario presents a deviation from the normative use of UTAUT2 and similar TAR models, which are traditionally employed in analysing larger populations to identify commonalities in technology acceptance behaviours (Huang & Teo, 2020; Tamilmani et al., 2021). Such studies typically yield quantitative data, allowing for statistical generalisation and the development of predictive models. In contrast, this research necessitates a qualitative application of UTAUT2, aiming to provide an in-depth examination of each identified blended learning champion. The objective is to uncover the rich, nuanced motivations and circumstances that drive their technology integration practices.

The concept of outliers thriving in the realm of innovation and change within the educational setting resonates strongly with what the literature describes as change or innovation champions (Warrick, 2009). These individuals, who can be found at any

level of an organisation, are skilled at not just initiating and *facilitating* change but also at implementing it effectively. Their role as change champions is particularly relevant in the context of our study's focus on a minority of lecturers at Eduardo Mondlane University, whose strong engagement with blended learning suggests a deep commitment to integrating these technologies into their teaching practices. Change champions are characterised by a mindset attuned to innovation—they are always in pursuit of new and better methods, actively inspiring and motivating others to follow suit. They possess the savvy to navigate the complexities of change, including what can be altered, how to garner support, and the tenacity to overcome challenges (Warrick, 2009). This description aligns seamlessly with the profile of the blended learning outliers identified in this research and, from now on, called blended learning champions. These lecturers, the blended learning champions, embody the essence of change champions within academia, applying their innovative spirit and resilience to overcome barriers and lead the way in the adoption of blended learning methodologies.

In the academic context, and particularly among lecturers, the characteristics of change champions echo the notion of e-learning champions as defined and presented by (Gachago et al., 2017), i.e., educators who take creative ideas, whether their own or others, and give them life through their teaching practices. The research by Gachago et al. (2017) aligns the characteristics of e-learning champions with the characteristics of a design thinking mindset, such as comfort with open-ended situations, empathy for users (learners), exploration, managing uncertainty, and a multidisciplinary approach to problem-solving. These champions are known for their focus on collaboration, generosity, and learner empathy, which are among the strongest themes that resonate with the e-learning champion mindset.

Focusing on the motivating factors for adopting blended learning, this research will employ characteristics of a design thinking mindset (DTM) alongside UTAUT2 constructs. The DTM characteristics that will guide this study include a focus on human values, the ability to craft clarity from complexity, embracing experimentation, being mindful of process, having a bias toward action, radical collaboration, and a

preference for showing rather than telling (d.school, 2011). These characteristics, in conjunction with UTAUT2 constructs, will be used to frame qualitative interviews with identified blended learning champions, aiming to uncover the nuanced interplay between their motivations, their teaching practices, and the institutional environment that supports or inhibits their innovative activities. The goal is to understand not just what motivates these champions but also how they think and approach challenges in their adoption of blended learning.

The ultimate goal of this research extends beyond merely understanding the motivating factors behind the adoption of blended learning by the blended learning champions at Eduardo Mondlane University. It seeks to make a contribution to the field of technology acceptance research (TAR) by illustrating the value of a human-centred approach in elucidating the intricacies of technology adoption. This study aims to add depth and context to the existing TAR framework, demonstrating how individual motivations, experiences, and perspectives can provide a richer, more nuanced understanding of why and how educators integrate new technologies into their teaching practices.

By focusing on the human elements within the technology adoption process, the research endeavours to highlight the importance of considering individual and collective experiences, mindsets, and environmental influences. This approach recognises that technology adoption in educational settings is not merely a matter of access or training, but is deeply intertwined with personal beliefs, professional identities, and the broader institutional culture, as will be discussed in more detail in the next chapter.

Thus, to achieve these broader aims and to delve into the complexities of blended learning adoption, the following research questions have been formulated:

Main Research Question

What are the key motivating factors and underlying mindsets that drive certain lecturers at Eduardo Mondlane University to adopt and integrate blended learning into their teaching practices?

Research Sub-questions

To deepen the understanding of the phenomenon, I was initially interested in answering the following sub-questions:

- How do blended learning champions perceive the usefulness and ease of adopting the educational technologies in their classrooms (*performance expectancy, effort expectancy, habit and price value*)?
- How do the *facilitating conditions* in the blended learning champions' surroundings (personal and organisational) influence their adoption of blended learning?
- What is the impact of age, gender, and experience on the motivations of blended learning champions towards the adoption of educational technologies?

The process of identifying blended learning champions at Eduardo Mondlane University was significantly aided by my involvement with the TIC-EID unit. As previously described, this unit's central role in overseeing the integration and usage of educational technology across the university provided a unique vantage point. Through this lens, I could discern which lecturers were not just using, but championing the application of, technology for blended learning. These insights were invaluable in pinpointing lecturers who stood out in their commitment to leveraging technological tools for enhancing educational delivery.

Furthermore, my dual capacity as a lecturer in the Engineering Faculty presented an additional layer of insight. This proximity to colleagues and firsthand experience in the faculty allowed for a more nuanced understanding of how technology was being adopted and adapted within their teaching methodologies. Consequently, the selection of blended learning champions was naturally inclined towards the Engineering Faculty. This choice was motivated by the desire to gather rich, contextually grounded data from lecturers, who were directly within my academic

sphere, ensuring an in-depth exploration of the phenomena surrounding blended learning adoption.

Chapter Overview

This section provides a brief summary of each of the chapters that follow:

Chapter 2 explores the theoretical frameworks underpinning this study. It delves into the unified theory of acceptance and use of technology 2 (UTAUT2) and its applications in higher education, examining how UTAUT2 intersects with the characteristics of the design thinking mindset (DTM) and the concept of blended learning champions. Additionally, this chapter discusses blended learning and its evolution within the Mozambican context, particularly at EMU, providing a review of the relevant literature.

Chapter 3 outlines the methodological approach of the study, arguing for the unconventional use of a qualitative approach to explore the motivations and behaviours of blended learning champions at EMU. Detailed descriptions of the participants, data collection, and analysis methods are provided. This chapter also highlights how participatory active techniques were instrumental in shaping the interviews. Furthermore, it addresses important aspects of validity and ethical considerations in the research process.

Chapter 4 presents the findings of the research, first as a summary of the participants' life stories, and then as responses to the sub-questions. I highlight key excerpts from the interviews, elucidating the most pertinent themes and insights that emerged from the discussions with the blended learning champions.

Chapter 5: The findings are contextualised within the existing body of literature in this chapter, and key points of convergence and divergence from the literature are explored. The chapter culminates in a discussion about the potential for integrating UTAUT2 and DTM characteristics, highlighting the insights offered by drawing these frameworks into the conversation.

Chapter 6: The final chapter provides answers to the research questions and reflects on the study's contributions to the field. It expands on the theoretical implications of

the research, proposing an integrated model that combines the insights from UTAUT2 and DTM characteristics. This chapter concludes the dissertation by summarising the key findings and limitations and suggesting directions for future research.

Conclusion

This chapter has laid the foundational groundwork for the research, establishing the context, rationale, and objectives of the study focused on the adoption of blended learning at Eduardo Mondlane University. It began by defining blended learning and its growing significance in higher education, then contextualised the research within the unique setting of EMU, particularly highlighting the initiatives and challenges faced in the adoption of blended learning.

The exploration of technology acceptance research (TAR) and the selection of the UTAUT2 framework, supplemented by design thinking mindset (DTM) characteristics, underpin the study's approach to understanding the motivational factors driving certain lecturers, identified as blended learning champions, to effectively integrate technology in their teaching. These champions, identified through my dual roles within the TIC-EID unit and as a lecturer in the Engineering Faculty, were key to unravelling the paradox of why extensive resources and training in educational technology have not translated into widespread adoption among the faculties and schools at EMU.

Chapter 2: Literature Review

Introduction

This chapter defines key concepts in the study, reviews empirical studies focusing on higher education sites, and explores theoretical approaches to blended learning and technology adoption within the existing literature. After having discussed a range of concepts related to blended learning and technology acceptance, I interrogate existing theoretical perspectives on technology adoption by focusing, specifically, on how the design thinking mindset and blended learning champions' behaviour and motivations could add value to the technology acceptance research.

The literature shows that blended learning and educational technology are deeply intertwined and that, in terms of the acceptance of technology for blended learning, researchers have focused on student behaviour and acceptance, with less attention being paid to technology acceptance and adoption by lecturers (Cavus et al., 2022; Granic & Marangunic, 2019). Another important realisation from the literature is that technology acceptance research has a strong tradition, with open and closed survey data analysis using statistical methods to produce factors and to comment on the impact of these factors. This research explores the possibility of appending the technology acceptance research insights through a smaller qualitative study, focusing on perspectives coming from the individual's context. The latter is framed by design thinking mindset characteristics. In doing so, this research contributes to broadening the discussion of technology acceptance, in general, and technology acceptance of educational technology in higher education, in particular.

Theoretical Framework

User adoption and technology acceptance are central to information system (IS) implementation in any context, leading to the development of a number of theories and models of user behaviour. This study takes as its initial focus the extended unified theory of acceptance and use of technology (UTAUT2).

Technology acceptance research has generated a variety of technology acceptance models and/or theories, such as diffusion of innovation, technology acceptance model, task technology fit theory, and theory of planned behaviour (Tamilmani et al., 2021). After reviewing eight dominant models, (Venkatesh et al., 2003) developed the unified theory of acceptance and use of technology (UTAUT), proposing the elimination of redundant constructs and attempting to harmonise variations from previous models and theories. UTAUT ended up with four main constructs which are:

- *Performance expectancy*: How much an individual user believes that using a specific system will improve job performance;
- *Effort expectancy:* How users perceived the degree of ease associated with using the system;
- *Social influence:* The degree to which the user feels that by using the system he or she will be socially validated by their peers, and
- *Facilitating conditions:* The degree to which the individual feels that organisational and technical support are easily available.

These constructs are modelled against two mediating variables: *behavioural intention* and *use behaviour* which are the main variables of the model. To complete the model, *gender, age, experience* and *voluntariness of use* were added as moderating variables.

Almost a decade later, (Venkatesh et al., 2012) reviewed the model to fill the gap that existed in describing individual contexts (Tamilmani et al., 2021) and named the revision UTAUT2. Venkatesh (2012) removed one construct, *voluntariness of use*, and added three new moderating variables:

- *Hedonic motivation*: How enjoyable users found the technology;
- *Price value:* The cognitive tradeoff between the perceived benefits of the technology and the monetary cost for using it; and
- *Habit*: The extent to which people tend to perform behaviours automatically because of learning.

Figure 1 illustrates the interrelation between UTAUT2 variables and moderators.

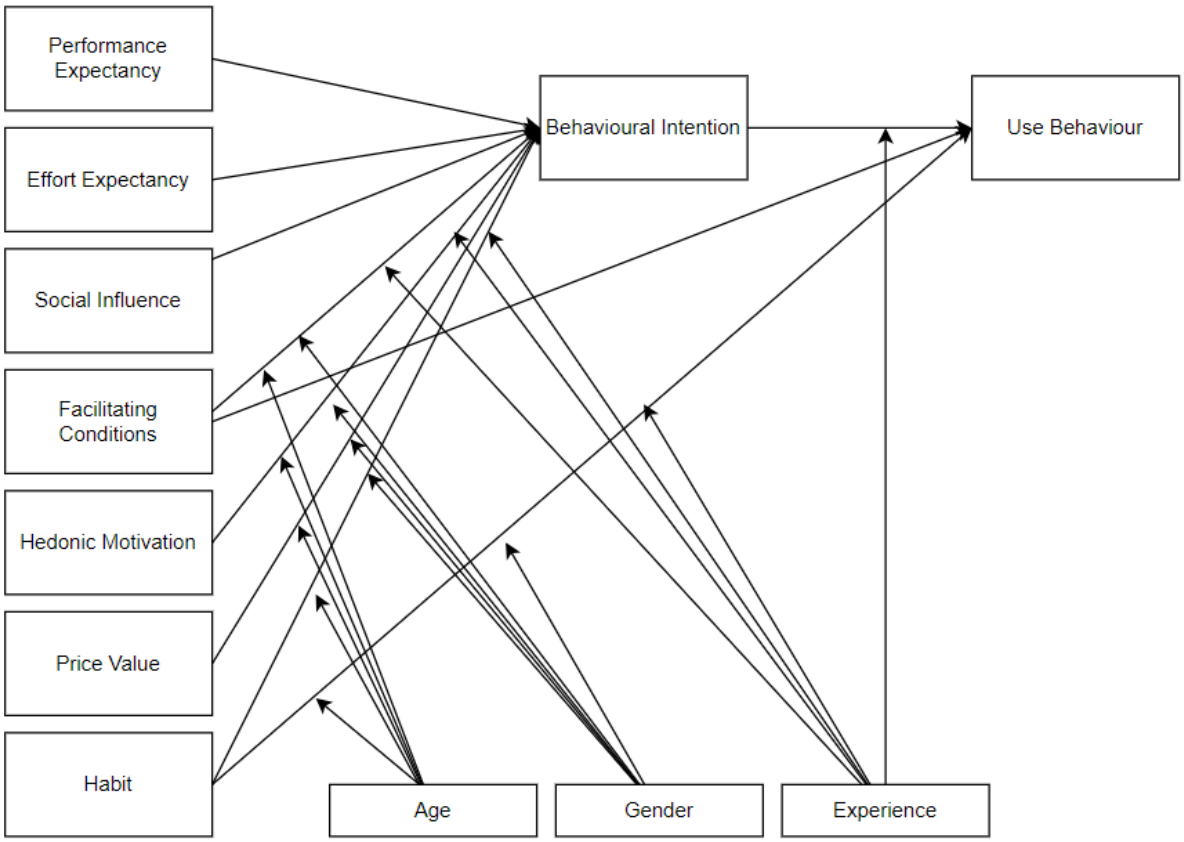

Figure 1. Modified UTAUT2 (Venkatesh et al., 2012).

UTAUT2 has been used in the educational technology context many times (Al-Nuaimi & Al-Emran, 2021) and has been proven useful in understanding *use behaviour* and predicting *behavioural intention*. For the current research, it is expected that each construct will shed light on what motivates the lecturers at EMU, who are the early adopters of LMS for blended learning. To achieve this, a few adaptations or interpretations will be necessary, for example, *performance expectancy* and *effort expectancy* will be explored in the context of previous experiences and previous contact with similar technology. Similarly, the participants will be asked to look at *social influence* and *facilitating conditions* from the standpoint of the academic community and at the organisational level (the university as a supporting unit to

facilitate LMS adoption). Finally, *price value* will be understood as learning goals achieved and student success rate.

Understanding Blended Learning And Technology Adoption

In the 21st century, technology has become pervasive. In every sphere of human interaction, the once passive consumer of information is now on the front line as the primary choice maker and content creator. The same effect is visible in the teaching and learning (TL) space where increasing voices call for more innovative and interactive ways of TL (EDUCAUSE Association, 2021). In the higher education space, student engagement has become a central topic, and the student is no longer seen as a content consumer, but rather as an active knowledge creator (Al-Shlowiy, 2022; Tsai et al., 2021). This means that the traditional face-to-face mode of provision of TL has been rethought and redesigned to engage students better and take advantage of emerging digital technologies (Ozkan Bekiroglu et al., 2022). For example, Tsai et al. (2021), in an empirical study that sought to understand the impact of various types of course activities and level of engagement, concluded that perceived engagement and learning outcomes were critical in activities with higher interaction among students and between students and lecturers. The same author confirmed that effective learning activities did not occur exclusively in class. This is complemented by other studies, such as the systematic review by Pinto and Leite (2020), that maintains that, for increased student engagement and improved learning outcomes, it is important to take advantage of emerging digital technologies to extend the traditional face-to-face TL approach, and this model is usually named the blended learning approach and, although it is not the exclusive definition of it, this one is the prevailing approach at EMU.

The Blended Learning Approach

Blended learning is a mode of provision of TL that combines face-to-face and online forms of TL in order to get the best out of the face-to-face mode of provision and, at the same time, introduce some flexibility of interaction in terms of time, space, place and, sometimes, even pace (Cheung et al., 2018; Heilporn et al., 2021). The “blend”

happens when synchronous activities (for example lecturing and tutoring) are combined with asynchronous activities, such as independent individual or collective study assignments, group discussions, or formative assessments mediated by technology (Alhramelah & Alshahrani, 2020; Bervell et al., 2021).

Although some authors (Anthony et al., 2022; Naidoo & Singh-Pillay, 2020) equate blended learning with digital technology use for TL, others (Kuntz & Manokore, 2022; Tsai et al., 2021) emphasise that intentional integration is more important than simply including opportunities for online interaction.

When deciding how to integrate in-person and online teaching and learning activities, several elements must be taken into account. In some instances, the majority of the contact between the lecturer and the students, as well as the actual delivery of the course, takes place in the classroom, while the materials and, sometimes, certain supplementary activities are offered online. In other instances, the majority of the class activities take place online, with occasional in-person sessions to resolve issues and foster a sense of community. In certain hybrid environments, students can select whether to participate in person or online (Heilporn et al., 2021).

For the purposes of this study, blended learning is considered a range of approaches that integrate, with varying degrees of intentionality, in-person and online learning activities. It incorporates components from each method to produce a diverse and effective set of teaching and learning interventions.

The Role Of Information And Communication Technology In Blended Learning

There is a vast range of possible digital technologies that assist and support the teaching and learning process and they are usually called educational technologies or just EdTech and, sometimes, EduTech. Duval et al., (2017) emphasised that the focus of EdTech is not to replace human teaching, but rather to enhance it through technology that facilitates learning design and flexible learning. Further, Januszewski et al. (2008) previously included in their conceptualisation of EdTech the creation and management of adequate technological processes and resources. What emerges from this broad definition of EdTech is that it does not only refer to the actual use of

technology for teaching (the What) and learning but also to the approach taken by practitioners when using EdTech (the How, When and Why) and this is particularly true for the lecturers who, as stated by Hennessy et al. (2022), have to acquire a new subset of skills to complement their traditional face-to-face lectures.

Kuntz and Manokore (2022) suggest that, for lecturers to successfully integrate educational technologies into their teaching, they need digital technology specifically tailored to the needs of the educational settings to help them shape their courses in an easily accessible way for their students. At the same time, the authors point to a particular type of structuring EdTech, the learning management systems (LMS). This is a type of software that is used to organise course content and design learning experiences in a seamless way (Bervell et al., 2020). LMS encompasses a wide range of possible learning design activities, both synchronous and asynchronous, and also individual and group activities. Good examples are (but are not limited to) forums, chats, polls, grade books, wikis, quizzes, and others (Kuntz & Manokore, 2022). Although LMS thrived in fully online courses or e-learning and has grown quickly to the point of being widely used and approved by institutions and students throughout the world, when reflecting on the importance of LMS for blended learning, Cleveland-Innes (2018) concluded that LMS is the actual cornerstone of blended learning because of its structuring nature and learning design capabilities. But not being too overly optimistic, the same author raised alerts about some criticism around LMS uses that led to an emphasis on the transactional management of students and encouragement of passive transmission of content. This is why it remains important for me to keep inquiring about the validity and adoption of EdTech, in general, and LMS, in particular, just as this research is set out to do.

Among many possible LMS solutions, Eduardo Mondlane University (EMU) elected the Modular Object-Oriented Dynamic Learning Environment (Moodle) as the institutional-wide LMS solution for blended learning (Figure 2) along with successive investment in computer labs, network infrastructure and lecturer training (Jornal Noticias, 2021).

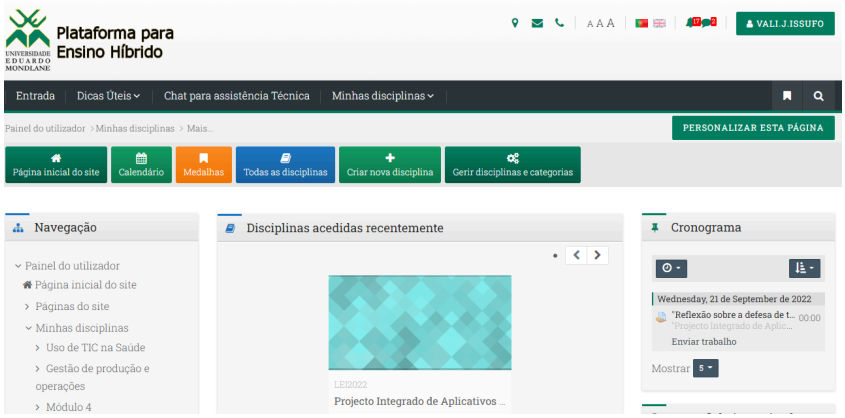

Figure 2. EMUs Moodle implementation (https://vula.EMU.mz).[3]

Technology Acceptance Research and Blended Learning in Mozambican Higher Education

"If you build it, they will come",[4] a well-known and overly repeated quote from a famous movie. Technology acceptance research (TAR) asks the question "Will they?" This question has been the subject of attention to many researchers in the field of Information Systems, in general, and in educational technology, in particular, over the years. These scholars borrowed tools from the social sciences, like sociology and psychology (Venkatesh et al., 2012), and applied them to the field of technology to understand users' motivation, beliefs and behaviours regarding the use and acceptance of technology. However, what is relevant to this study is that previous attempts to review and understand the overall progress made in the field of TAR, such as the ones by Al-Maroof et al. (2022) covering 12 years of TAR in blended learning, Al-Nuaimi & Al-Emran (2021) covering 15 years of TAR of LMS, and Faustino & Simões (2020) covering 10 years of the contribution of TAR research higher education (HE), showed that the scholars tended to pay more attention to the students as the users of EdTech and less to the lecturers. Furthermore, the predominant approach was quantitative with very few studies including the voices of

[3] Beside the university logo, it says "blended learning platform" (Portuguese *"Plataforma para Ensino Híbrido")*.
[4] From the movie Field of Dreams (1989).

the users of EdTech. Notwithstanding the fact that these studies were inherently narrow (due to the practical and necessary application of inclusion and exclusion criteria of resources), they provided compelling evidence of the need to further understand the role of the lecturers within the EdTech and blended learning context, and this is even truer when considering the aforementioned importance of the lecturers in the success of any blended learning implementation.

Another significant realisation from the reviewed literature that impacted this study is that previous research draws a good picture of the user's perception of EdTech, how they behave and use it, but as Faustino and Simões (2020) recommend, the *motivating* factors (why they use it) need more research. Motivation is of utmost importance in resource-constrained settings because, as at EMU, just the sheer number of potential barriers to technology adoption for blended learning may be overwhelming to the users in general and even more so for the lecturers who are responsible for *facilitating* the teaching and learning process.

In Mozambique, where this study takes place, the quest for understanding EdTech adoption can be traced back to the early 2000s with relevant studies, like the ones from Muianga (2005) and Mendonça et al. (2012), that engaged with students to explore the use of LMS and blended learning as a strategy for fostering student-centred teaching and learning or strategies from Ramos et al. (2011) and Pridmore and Yates (2005), that would seek to understand the role of EdTech in promoting distance learning. What these studies have in common is that they focused on the student's interaction with technology and the findings were concentrated on the physical resources needed to teach and learn with technology, which, at the time, were relatively scarce, and the cost was high (Muianga, 2005). Computers were hard to obtain and the internet was slow (Ramos et al., 2011). However, researchers soon noticed the need to include the lecturer's perspective in the narrative.

Expanding on this perspective, we find Mendonça et al. (2012) exploring the curricular reforms needed to foster blended learning by engaging with lecturers in a qualitative study where it was concluded that, although the lecturers were aware of,

and in accordance with, the need to implement blended learning, they felt unheard, and lacked the motivation to be part of the process. Nevertheless, Mendonça et al. (2012) opened the window for understanding motivation by highlighting that lecturers did not feel ownership of the change process and pointed out that the lack of training was one of the main challenges. Following that, Muianga et al. (2019) looked again at the use of the LMS for fostering blended learning, but, this time, included both student and lecturer's perspectives in a quantitative study that aimed at understanding the impact that EdTech training has on lecturer professional development.

Continuing with this theme, Muianga et al.'s (2019) study concluded that, on one hand, lecturer training positively impacted their perception of EdTech and its role in their professional development, but, on the other hand, there were lecturers who were using EdTech intensively and were committed to the necessary changes to adopt blended learning regardless of whether or not these lecturers had participated in the lecturer development program (lecturer training). In a nutshell, Mozambican researchers have been discussing EdTech and its use for blended learning, and their studies have been placing emphasis on the student's perspective (Mendonça et al., 2012; Muianga, 2005; Pridmore & Yates, 2005; Ramos et al., 2011) and exploring the use of particular technologies, such as mobile learning (Nygren et al., 2019) and specialised software (Coughlin, 2015; O'Sullivan & Seabra, 2016). However, there are studies that explore the lecturer's perspective (Muianga et al., 2019; Sailors & Hoffman, 2019), focusing on the impact of the lecturer development program. Muianga et al.'s (2019) study is particularly relevant to this research to the extent that it identified lecturers, who seemed to have an inherent drive to overcome the barrier and use EdTech intensively, but the study did not reflect on their role in EdTech acceptance. At first glance, the lecturers identified by Muianga et al. (2019) resemble what this research identifies as blended learning champions, and this research potentially contributes to a further understanding of who these champions are and what motivates them.

Technology Acceptance and Motivation

The implementation of educational technologies for blended learning has been a widely discussed topic in recent years. LMS has been central to this discussion and although its potential to improve and modernise traditional teaching and learning is generally recognised, many studies show that adoption and use are, in most contexts, unimpressive (Mohan et al., 2020). And while there are many well-researched barriers to technology adoption such as poor internet (L. G. King et al., 2019), lack of computers (Francom, 2020) and lack of training for students (Heilporn et al., 2021) or lecturers (Baltaci-Goktalay et al., 2006), motivation remains a less explored theme. Understanding what motivates or discourages technology users is at the heart of technology acceptance research (TAR). When observing the implementation of EdTech, it is fundamental because TAR directly contributes to the decision-making regarding resource allocation and shapes lecturer development programmes (Bervell et al., 2020; Venkatesh et al., 2012).

The role of the lecturer in the implementation of blended learning has been emphasised by scholars (Al-Shlowiy, 2022; Baltaci-Goktalay et al., 2006) and Ozkan Bekiroglu et al. (2022) add that the role of the lecturer in blended learning implementation is multifaceted and requires a range of skills and competencies to the point that their role in the teaching and learning process is immensely reshaped because the lecturer is no longer acting as a knowledge provider, as Levin and Wadmany (2006) posit:

> The assumption is that lecturers engaging in blended learning will adapt to pedagogies appropriate not only for blended learning but for learners preparing to engage productively in 21st-century societies, which are characterised by significant diversity…These “lecturers” will be identified by new labels, such as facilitators, mentors, advisers and moderators (Cleveland-Innes, 2018).

Kuntz and Manokore (2022) add that the lecturer's responsibilities now follow the students even when they step outside of the classroom by helping them establish

workgroups, defining tasks and roles, and developing the student's teamwork competencies.

The changes required for the lecturer to adopt blended learning transcend the aforementioned barriers (computers, internet, etc.) and reach the point of fundamentally changing their pedagogical beliefs, which is directly tied to their motivation (Ozkan Bekiroglu et al., 2022), and which is why understanding the lecturer's perceptions and what motivates them will support the uptake of blended learning. What Muianga et al. (2019) unravelled was something that had been subjected to discussion in seminal works, such as the likes of Rogers (2010) in his diffusion innovation theory where he explains the process by which new ideas, technologies, or innovations spread through a society or organisation. The diffusion innovation theory identifies five categories of adopters: innovators, early adopters, early majority, late majority, and laggards. Moreover, the theory suggests that there are certain characteristics and behaviours that distinguish these adopter categories, and highlights the importance of early adopters as playing an important role in spreading awareness and interest in innovation among others. However, Venkatesh et al. (2012) bring to attention that not all early adopters become consistent users, while some that join late, do. In a systematic literature review, that aimed at understanding the relationship between lecturers' pedagogical beliefs and technology use in education, Tondeur et al (2017) brought to attention the fact that the actual exposure to technology-rich experience has the potential to change lecturers' pedagogical beliefs and inclination towards EdTech adoption. Meaning that even an initially reluctant lecturer may turn out as a fierce user of EdTech later. Researchers like Drechsler et al. (2021) and Warrick (2009) challenge and/or extend Rogers's (2010) early adopters by bringing in the notion of innovation champions, described as individuals who take a proactive role in promoting and driving the adoption of new and innovative ideas or technologies within their organisation or community. These individuals are often, but not necessarily early adopters(Gachago et al., 2017), who possess the enthusiasm, and influence necessary to inspire others to embrace change and take risks. After systematically reviewing 170 studies characterising the appropriate use of EdTech in resource-constraining countries, Hennessy et al. (2022)

reinforced that, in education settings, mechanisms must be found for identifying high-performing lecturers to act as champions and, prior to that, Warrick (2009) went even further by attesting that developing change champions was a “high pay investment” for any organisation seeking to implement innovation. Although anecdotal evidence shows that innovation champions naturally emerge in any given situation, scholars (Patnaik & Gachago, 2020; Warrick, 2009) support that it is also possible to intentionally develop champions because the championship is a matter of how people perceive and engage with the world; it is a matter of mindset, which Meier (2010) describes as a mental attitude that influences our ways of thinking and acting. This research addresses the challenge of mindset development using the e-learning champions mindset, which, in turn, is based on literature and studies on the design thinking mindset, as proposed by Gachago et al. (2017) and focuses on lecturers that fall into the description of innovation champions, designated in this study as blended learning champions.

In the domain of technology acceptance research (TAR) and, particularly when utilising UTAUT2, there is a reliance on quantitative methodologies to discern common patterns and attitudes among specific populations, such as lecturers, in the context of blended learning. While these approaches are invaluable for understanding general trends and user behaviours, they inherently possess challenges in identifying distinct subsets of adopters who might play pivotal roles in the adoption and advancement of technology. This is particularly relevant when considering the concept of blended learning champions. Blended learning champions, as highlighted in this chapter, are individuals within educational settings who not only adopt but also proactively advocate and facilitate, the use of educational technology. These champions are often critical in influencing their peers and driving the overall acceptance and success of technology initiatives. However, the aggregative approach of standard TAR and UTAUT2 methodologies tends to amalgamate these individuals into the larger population, thus potentially obscuring their unique characteristics, motivations, and behaviours.

The consequence of this methodological oversight is significant. By not distinctly recognising and analysing the role of blended learning champions, research and practice might overlook crucial insights into how these individuals can be supported and leveraged to foster a more effective and widespread adoption of technology in educational settings. Literature suggests that recognising and nurturing these champions is not just beneficial but, perhaps, essential for the successful implementation and acceptance of blended learning and other educational technologies (Warrick, 2009).

Therefore, it becomes fitting to complement traditional TAR and UTAUT2 with qualitative data that allow a deeper exploration into the individual experiences and perspectives of lecturers. Such approaches would enable a more nuanced understanding of the dynamics at play, particularly in identifying and empowering blended learning champions, who could be instrumental in bridging the gap between technology potential and its effective utilisation in educational contexts.

Technology Acceptance and Design Thinking Mindset

As previously discussed in the methodology section, technology acceptance research (TAR) is widely applied in the information systems field. Furthermore, in relation to educational technology for blended learning, TAR helps to understand the factors that influence lecturers' integration of educational technologies in the teaching and learning processes. TAR provides valuable insights into the user's perception of the motivators and barriers to technology adoption (Anthony et al., 2022), such as resource availability (Francom, 2020), technical skills (Baltaci-Goktalay et al., 2006), and, even, pedagogical beliefs (Hennessy et al., 2022). When looking through the lens of UTAUT2 with constructs, such as *social influence* and *facilitating conditions*, researchers gain valuable insight into how factors, such as personal background, previous experiences with technology, and organisational culture, impact the acceptance of EdTech among lecturers (Huang & Teo, 2020). Therefore, by examining the attitudes and behaviours of lecturers towards technology use, TAR can help to evaluate the effectiveness of blended learning initiatives and inform future developments in educational technology. However, since TAR has traditionally

focused on qualifying the aforementioned factors through statistical sampling and mathematical modelling (Tamilmani et al., 2021), it does not fully capture the richness of the individual who can be influenced by particular contextual factors, the individual positioning in relation to social dynamics and, even, emotions (Sherman & Howard, 2012). For example, an individual may resist or adopt technology not because they perceive the technology as being easy or hard to use, but because their personal values or identity are or are not in alignment with the technology presented to them. That was the case of a study by Huang & Teo (2020) that aimed at understanding lecturers' relationship between pedagogical beliefs and technology use in education and concluded that lecturers with a particular set of pedagogical beliefs (leaning towards constructivism) are more likely to adopt technology in a student-centred way. This is to say that the more subjective and contextual aspects of technology acceptance, at the individual level, tend to be overlooked in the traditional TAR, limiting, to some extent, our understanding of how users engage with and are impacted by technology. This calls, not for a replacement of theories, but for the incorporation within TAR of a greater appreciation for the individual context and perspective.

Design thinking (DT), a human-centred design approach, is increasingly influential in the educational landscape (Beligatamulla et al., 2019; Rauth et al., 2010). DT is defined as a methodology for practical, creative problem-solving that begins with understanding unmet user needs (d.school, 2011). It foregrounds developing a deep understanding of the people for whom products or services are being designed, encouraging innovators to step into their users' shoes and engage in empathy-driven innovations. This philosophy extends beyond traditional design boundaries, emphasising a holistic approach to complex problems, by using a structured problem-solving approach that involves a specific series of steps. These steps typically include empathising with users, defining the problem, ideating solutions, creating prototypes, and testing them (d.school, 2011). Core to the philosophy is the belief that DT processes can be taught, learned, and applied to various challenges.

Complementing this, the design thinking mindset (DTM) refers to the cognitive and behavioural characteristics that underpin the DT methodology. The DTM is a way of thinking that embraces empathy for the user, accepts ambiguity, encourages ideation and experimentation, and supports collaboration and feedback (Vignoli et al., 2023). Therefore, it is not the process that makes design thinking powerful, but rather the mindset and philosophy that make those steps effective (Schweitzer et al., 2016).

Inspired by DTM, Gachago et al. (2017) explored how eLearning champions in a higher education institution displayed characteristics that aligned with design thinking mindset characteristics. The study identified seven key themes that were evident in the practices of these champions:

- Collaboration and generosity: This includes working well with others and sharing knowledge and resources freely.
- Learner empathy: Understanding the feelings of learners and creating solutions that respond to those needs.
- Problem orientation: Focusing on identifying and solving real-world problems.
- Exploration and play: Encouraging a spirit of experimentation and the freedom to explore new ideas.
- Reflection and resilience: Engaging in self-reflection and persevering through challenges.
- Focus on practice: Prioritising practical application of ideas and theories; and
- Becoming change agents: Acting as catalysts for change within their institutions, especially in contexts serving underprivileged students.

These themes overlap with the DTM model from the Institute of Design at Stanford, which includes similar characteristics, such as radical collaboration, human values focus, clarity in problem-solving, embracing experimentation, and mindfulness of process (Gachago et al., 2017). However, Gachago et al.'s (2017) study focuses on the scholarship of teaching and learning, and the role of social responsibility beyond that of the DTM model from the d.school, indicating a deeper engagement with pedagogy and educational theory, and an identity as responsible change agents within the academic community.

In terms of technology acceptance during blended learning, DTM plays a crucial role. Blended learning, which combines traditional face-to-face instruction with online components, often challenges educators and learners with the integration of new technologies. The adoption of these technologies can be enhanced by the characteristics of DTM. For example, the empathy aspect of DTM can help TAR researchers better understand and meet the diverse needs of lecturers and learners in a blended environment. Furthermore, the collaborative nature of DTM encourages the sharing of best practices and collective problem-solving, making the adoption of technology a more inclusive and manageable process. This approach aligns well with the findings of Picciano et al. (2014), who emphasise the evolving nature of blended learning and its integration with information communication technologies (ICTs).

The iterative nature of DTM is particularly beneficial in the context of technology adoption in education. As new tools and platforms emerge, lecturers equipped with a DTM approach can evaluate, adapt, and integrate these technologies more effectively into their teaching practices. This iterative process ensures that technology adoption in blended learning is not static but a continuous journey of improvement and adaptation, as discussed by Cronjé (2020) in his exploration of the evolving definitions and models of blended learning.

Moreover, the role of faculty in adopting educational technology, as explored by Baltaci-Goktalay et al. (2006), underscores the importance of support and development efforts in *facilitating* technology acceptance. The application of DTM in faculty development can aid in this process by providing a framework for understanding and navigating the challenges associated with technology integration in education.

From the above and reflecting on the previous discussion on TAR, it is apparent that design thinking and design thinking mindset hold significant promise for enhancing educational practices, particularly in the realms of blended learning and technology acceptance as articulated by (Gachago et al., 2017). By fostering empathy, collaboration, and an iterative approach to problem-solving, DTM characteristics equip educators and learners with the tools necessary to navigate and succeed in the

modern educational landscape. The integration of DTM with TAR can lead to more innovative, adaptive, and learner-centred approaches, ultimately enriching the learning experience and outcomes (Schweitzer et al., 2016).

Now, looking particularly at UTAUT2, it is possible to draw parallels between its construct and the DTM characteristics, since, while the first explores organisational and personal factors using performance expectancy, effort expectancy, social influence, and *facilitating conditions*, the latter gives a more comprehensive understanding of the same factors through user empathy and/or problem orientation. In the same way, if UTAUT2 takes on the motivation focuses, *behaviour intention* and *user behaviour*, DT emphasises empathy, experimentation and reflection. This shows that combining the human-centred approach with traditional TAR, as with UTAUT2, may help in addressing more effectively the challenges of technology adoption, in general, and of educational technology adoption, in particular. Table 1 below illustrates how Gachagos's (2017) design thinking mindset characteristics can be combined with UTAUT2 constructs to extend both approaches for a more effective technology adoption process:

Table 1. Design thinking mindset characteristics combined with UTAUT2 constructs.

DTM characteristics	**UTAUT2**	**Related Question**
Collaboration and Generosity	*Social Influence* and *Habit*	How can we leverage collaboration to encourage *Social Influence* and *Habit* in technology adoption?
Learner Empathy	*Price Value*	How can empathy be used to improve perceived *Price Value* among lecturers?

Problem Orientation	*Effort Expectancy*	What problems or barriers can be identified to improve *Effort Expectancy* in technology use?
Exploration and Play	*Hedonic Motivation* and *Facilitating Conditions*	How can we encourage exploration and play to improve *Hedonic Motivation* and *Facilitating Conditions*?
Reflection and Resilience	*Behavioural Intention* and *Use Behaviour*	How can resilience and reflection influence *Behavioural Intention* and *Use Behaviour* in technology adoption?
Focus on Practice	*Performance Expectancy*	How can we align user needs and expectations to improve *Performance Expectancy*?
Change Agents	*Facilitating Conditions* and *Social Influence*	How can change agents improve *Facilitating Conditions* and *Social Influence* for technology adoption?

In light of these combinations, new opportunities emerge for TAR. Looking at Collaboration and Generosity combined with *Social Influence*, if UTAUT2 finds significant *Social Influence* factors that could be improved, DTM characteristics will help in understanding how or why. For example, by checking how lecturers collaborate and help each other with EdTech adoption, DTM characteristics will increase the value of the insight already gained with UTAUT2 and also stimulate the positive aspects found that will enhance *Social Influence*, creating a virtuous cycle.

Another good example of the opportunities that emerge is that by employing the DTM characteristics to understand how lecturers currently engage with EdTech (Learner Empathy), the need of the individual in context will emerge and will be used to improve UTAUT2 *Performance Expectancy*. To inform *Effort Expectancy*, the problem-orientation principle can be used to identify and address common barriers to technology adoption, and the same line of thought could be applied to the rest of the combinations.

Conclusion

This literature review chapter has navigated through the complex landscape of blended learning and technology adoption in higher education. By exploring theoretical frameworks, particularly UTAUT2, it underscored the multifaceted nature of technology adoption, emphasising constructs, such as *performance expectancy*, *effort expectancy, social influence, and facilitating conditions*. The review noted the methodological gap in existing research, which often did not distinctly recognise and analyse the role of blended learning champions, pivotal in driving effective technology adoption. To address this, it advocated for a balanced approach that melded quantitative models, like UTAUT2, with qualitative insights from design thinking mindset characteristics. Such a comprehensive approach enriches our understanding of user behaviour and the critical role of lecturers as agents of change, providing a foundation for future research that is more adaptive, inclusive, and effective in educational technology adoption.

Chapter 3: Research Design

Introduction

This chapter outlines the methodology used to explore what motivates blended learning champions to adopt educational technology. The study takes an interpretive approach that combines traditional technology acceptance research (TAR) with characteristics of design thinking to provide a more human-centred perspective on technology adoption with particular emphasis on the adoption of educational technology. The forthcoming sections provide a detailed account of the data collection experience and the process of data analysis.

Research Approach

This study follows an interpretive phenomenology, which, according to Elliott and Timulak (2005), is a qualitative approach that seeks to understand and make meaning of a given phenomenon as it manifests from the participant's perspective within their specific context. This approach goes beyond describing experiences, aiming instead to interpret the deeper meanings that individuals give to their lived experiences. This methodology is particularly relevant for exploring the motivations behind blended learning adoption among lecturers at EMU, as it allows for an in-depth understanding of how these educators engage with educational technologies within their unique socio-cultural environment.

The alignment of interpretive phenomenology with the study's data collection methods, such as in-depth interviews and participatory techniques, ensures that the participants' voices are central to the analysis. This approach facilitates a rich exploration of how blended learning is experienced and understood by those directly involved. As highlighted by Frechette et al. (2020), interpretive phenomenology is well-suited for capturing the complexity of lived experiences, particularly in contexts where participants' perspectives are deeply influenced by their social and cultural

environments, making it an effective framework for uncovering the nuanced factors that influence technology adoption in a developing country context.

Since the research engaged with innovation champions (blended learning champions) to understand their motivation, the qualitative approach through in-depth interviews (Seidman, 2013) helped in providing the opportunity to understand the subjective lived experiences of the participants (Sayre, 2001) and, at the same time, gave me the opportunity to have personal involvement with the participants and the data, considering that I was, at the time of this study, part of EMU's team responsible for fostering the adoption of educational technology at the University.

Methods

The starting point of this research is within technology acceptance research (TAR), which is addressed through the lens of the unified theory of acceptance and use of technology (UTAUT2). This framework is the underlying approach to understanding motivation and adoption of educational technology for blended learning. However, since the gap that the study addressed was related to the scarcity of research showing intimate knowledge of particular technology users within traditional TAR, this study unconventionally explored a qualitative approach through the use of in-depth interviews and a focus group, as opposed to the traditional use of surveys and statistical sampling and analysis. The data collected through in-depth interviews and focus groups was then analysed under the umbrella of the constructs of UTAUT2 and, likewise, the findings were presented according to the same framework.

Because the study focused on what the literature calls *innovation champions* (in this study, termed blended learning champions) to tackle the motivating factors for technology adoption, I was in need of an adequate conceptual underpinning for discussing the findings in light of the blended learning champions approach. For that, the design thinking mindset characteristics, as proposed by Gachago et al. (2017), were used to bring the human-centred approach into the discussion.

During the discussion, the findings that were originally based on UTAUT2 were revisited. The goal was to explore how a design thinking mindset could complement

traditional technology acceptance research (TAR), specifically, wanting to understand what motivated blended learning champions to adopt educational technologies and how they went about it.

By looking at the problem through a design thinking lens, I hoped to gain a more personal and contextual understanding of technology adoption. This approach could provide a new perspective on the factors influencing blended learning champions and their decision-making processes. Figure 3, below, illustrates the methodological approach used to combine UTAUT2 and design thinking mindset:

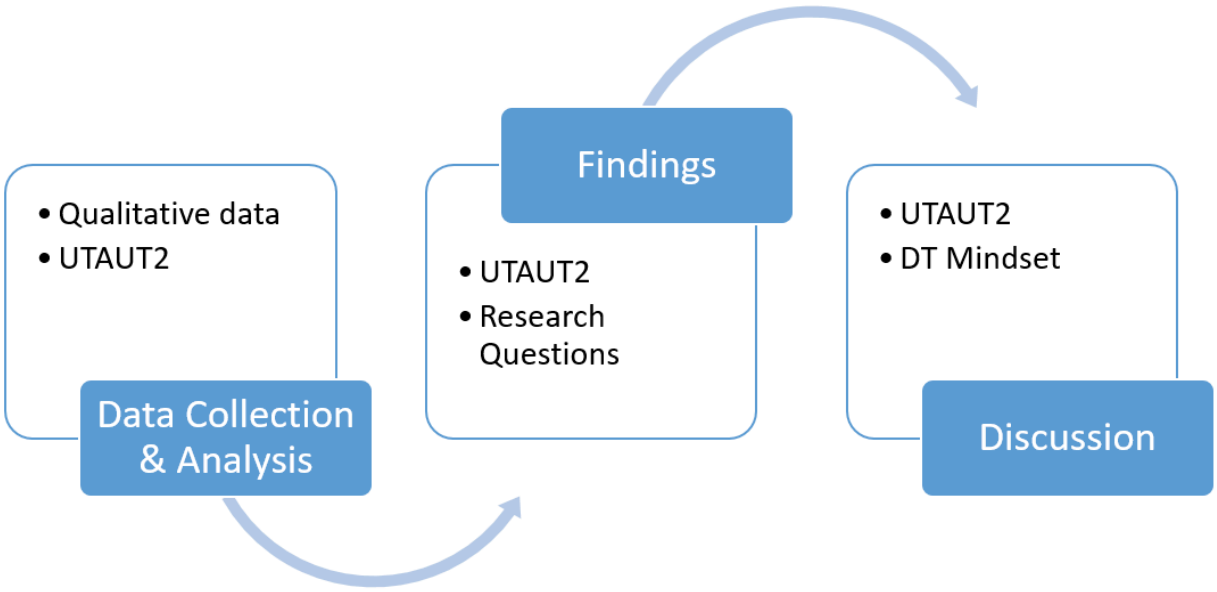

Figure 3. Methodological approach flow.

Ethical Considerations

This study engaged with human participants, therefore, the UCT Research Ethics Code for Research Involving Human Participants was followed attentively. The participants of the study were selected lecturers from the Engineering Faculty at EMU. Although the participants were purposively selected using the criteria that are described in the subsequent section, participation was voluntary and the participants signed a consent form that was soundly explained to them before signing. The

consent form described in sufficient detail how the collected data would be treated in terms of confidentiality, and any possible harm, which might ensue.

Regarding the possible harm, it was anticipated that some questions during the interviews would lead to the participant's personal opinions on peers, the department or, even, the university, and it was possible that sometimes the participant would not be comfortable with the eventual publishing of such opinions. Therefore, all participants were given pseudonyms and their data were anonymised after coding; no raw data would be published and all collected data were reverted to the respective participants after transcription for checks and possible corrections. Participants were also informed that they remained free to change or withdraw any information at any given moment of the study and even to withdraw from the study without harming their professional or personal image.

This proposal, alongside the informed consent form, the data management plan, interview questions and other relevant documents were submitted to UCT's School of Education Ethics Committee for validation and consequent ethical clearance. Once ethical clearance was granted, additional approval was necessary from the Engineering Faculty of EMU's Deputy Director of Research and Extension. Only then were prospective participants approached about participation in the study.

Participants

The intention of this study was to understand factors that motivate lecturers to use educational technology for blended learning. To better engage with lecturers, this qualitative study engaged with a particular group of lecturers that the literature (Drechsler et al., 2021) describes as innovation champions. Understanding what motivated these blended learning champions was considered in this study as a substantial move towards the uptake of blended learning, since these blended learning champions were the ones making intensive use of educational technology at EMU, and were also the ones positively influencing the academic community towards it. I am part of the Information and Communication Technology for Education, Research & Development Unit (TIC-EID), which is the unit responsible for fostering

educational technology adoption at EMU through research, training and general ICT support. I am also a lecturer in the Faculty of Engineering, where the study took place. Finding the champions included a combination of working with them during educational technology training sessions, supporting them in their daily use of educational technology (mainly the LMS) and, above all, knowing them personally and knowing how they interacted with their peers. According to Maxwell, (2009), this strategy fits into purposive sampling. This strategy is used to help in identifying the cases, individuals, or communities best suited to help answer the research.

Initially, I identified six blended learning champions, who were approached, and who confirmed their willingness and availability to participate in the study. However, after conducting the first interviews, it became clear that each interview could take more time than initially anticipated, and only three of the participants were able to book the time and effectively participate in the interviews. The other three did not completely withdraw from the research, but, rather than committing to participating in three in-depth interviews, they offered to participate in shorter conversations, if needed. The participants that were able to follow through were, luckily, from different demographics and genders and were in different stages of their careers: one female junior lecturer, one male lecturer in mid-career, and one senior female academic. These three participants covered a range of UTAUT2 variables.

Data Collection and Analysis

For this qualitative study, the data were collected through in-depth, semi-structured interviews and a focus group inspired by the three-interview protocol as proposed by Seidman (2013). This protocol provided room for context exploration where the participants gradually reconstructed their experience within the topic under study as shown below in Table 2:

Table 2. The Three-Interview Series (adopted from Seidman, 2013).

Phase	**Objectives**
Interview One: Focused Life History	Explored context asking the participant to tell as much as possible about him or herself in light of the topic, with particular emphasis on the early experiences. This interview mainly focused on shedding light on UTAUT2 variables (*gender*, *age* and *experience*) and opened the way for the next interview.
Interview Two: The Details of Experience	Building upon the first interview, the participants were then asked to direct the focus to their present experience with EdTech and were encouraged to reconstruct in detail the relationship with other intervening parties, such as, students, colleagues, family, etc. At this stage, the most important constructs of UTAUT2 were explored, such as *performance expectancy, effort expectancy* and *social influence,* although the remaining constructs *(hedonic motivation* and *price value*) ended up emerging spontaneously.
Focus group: Reflection on the Meaning	In this last stage, the question of 'meaning' was addressed and the participant reflected on their experience and how they reached the point at which they were at present. Following on UTAUT2 approach, the question of 'meaning' was addressed by exploring the interrelations between the constructs and their variables to shed light on the participants' *behavioural intention* and trace it back to *use behaviour*

With this approach, two separate interviews with each participant were scheduled, giving sufficient space between them (usually 2 to 6 weeks) (Seidman, 2013). Based on Seidman, each interview should have an average duration of 90 min. Considering the typical availability of a lecturer at EMU, the duration of each interview was initially adjusted to 30-60 min with possible ad hoc short sessions for review and further feedback whenever necessary. However, the empirical evidence confirmed that the duration suggested by Seidman (2013) was more suited for in-depth interviews, therefore the interviews ended up being an average of 90 minutes each.

Seeking strategies to elicit more dynamic and iterative interviews, I employed activities inspired by the work of Bozalek and Biersteker (2010) named participatory learning and action (PLA) techniques. PLA are a set of methods that are designed to engage participants in a manner that promotes participation, empowerment and ownership. It involves using a range that makes use of visual representation and discussion to gather information and generate dialogue. Although PLA is typically used to engage communities and/or groups (Bozalek & Biersteker, 2010), I found that PLA techniques were a great way to immerse the interviewer and interviewee in a colourful conversation that served the purpose of exploring in-depth the experiences and motivations of the blended learning champions well.

For the first set of interviews, the participants were invited to use the PLA technique " River of Life" (Bozalek & Biersteker, 2010). The participants were given a sheet of paper, and shown a few examples of "River of Life" drawings available online and, after that, participants were given 15 to 20 minutes to work on the initial drawing. When the participant felt ready, the conversation began with the participant doing a walkthrough of the "River of Life", starting from the early stages of their lives and moving progressively to the present, always taking enough time to explore every eventful moment in the drawing. Figure 4, shows the "River of Life" from one

participant.

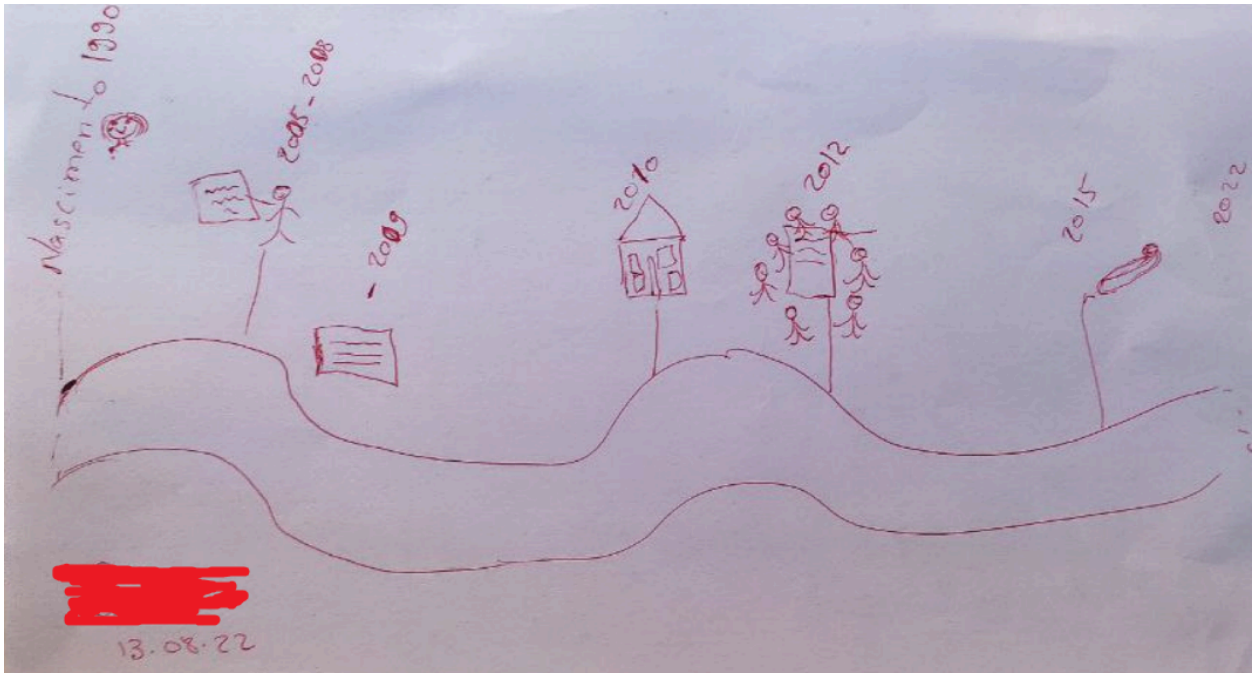

Figure 4. Example of River of Life from Interview 1.

Since UTAUT2 constructs served as the foundation for the data collection, the interviewer would question participants more closely whenever it felt necessary to add more context around any specific UTAUT2 construct or variable. An unexpected outcome of the first interview was that, although it was initially planned to explore mainly three UTAUT2 variables, i.e., *age*, *gender* and *experience*, what actually happened was that the fluidity of the conversation presented the opportunity to explore all constructs of UTAUT2. As an example, in Figure 4, it can be seen that, in 2012, a dynamic around constructs, such as social influence and hedonic motivation could be explored.

The timing of the second interview varied, with a spacing of 1 to 3 weeks between interviews, depending on the availability of the participants, and the main goal was to explore the blended learning champion's perception of their use of educational technologies in the context of their surrounding environment, i.e., the university, the department, colleagues, students, and the resources they use. The PLA technique selected was community mapping. According to Bozalek and Biersteker (2010), this

technique helps in visually analysing the physical, social, economic and environmental features of a given community. Community mapping asks participants to draw a map that helps in identifying resources, social networks and any other important resources that shape the boundaries of the community. For this study, the community is Eduardo Mondlane University with a particular focus on the Engineering Faculty. Differently from the first interview, where the participant was given time to draw the River of Life, for the second interview, the technique was explained to the participant and then the mapping was done progressively, while the interview unfolded. The participant was first guided to reflect on where they wanted to set the boundaries of their community, the whole university, the faculty or the department level. Then they were asked to identify the resources they thought influenced or impacted their motivation and use of educational technology for blended learning. In this step, not only physical resources emerged, such as, computers and classrooms, but also policies, regulations, and curricula. Participants then identified people and groups and mapped how they thought they related to each other as well as how the resources impacted them. This allowed me to explore UTAUT2 constructs in full richness and see the UTAUT2 constructs “talking” to each other. For example, blended learning champions saw the relationship with their peers (*social influence*) in relation to themselves and the available resources (*f conditions*), as well as how they related student outcome (which blended learning champions equated with *price value*) and the effort they were willing to put in to see blended learning happening (*performance expectancy*). Figure 5 shows an example of a community mapping by one of the blended learning champions.

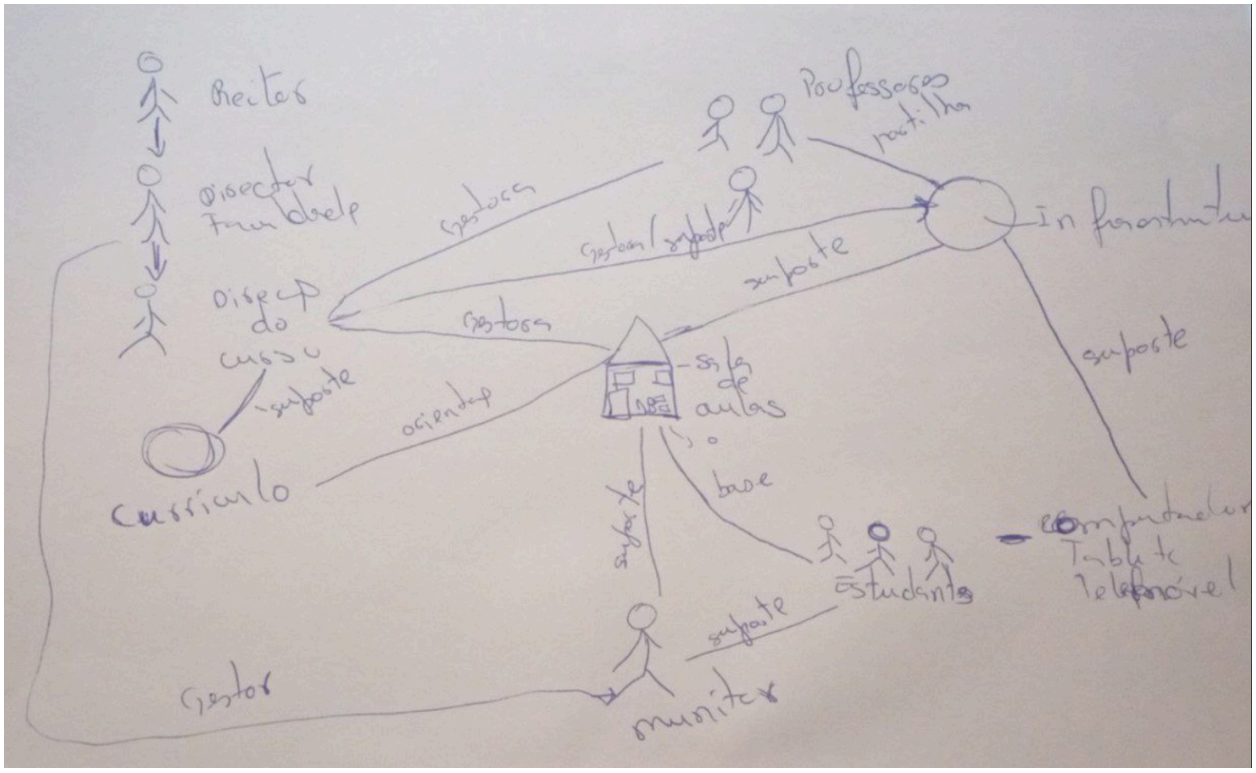

Figure 5. Example of Community Mapping from Interview 2.

The third engagement with the participants was a focus group and was conducted after the data analysis of the first two groups of interviews, using River of Life and community mapping, respectively, in the form of a focus group. Focus groups, according to Nyumba et al., 2018) are a suitable technique to explore shared perceptions, attitudes, and opinions of a group on a given topic. This method was ideal, considering that all the participants knew one another, and were previously consulted and had agreed to discuss initial findings collectively. The blended learning champions were invited to a Zoom meeting session, where I initiated the session by presenting the findings from the first interviews (Chapter 5). This was followed by a discussion among the blended learning champions about the findings. They were also asked to share their ideas regarding their colleagues' perspectives as presented by me, and they had the opportunity to discuss what motivated them. The results from the focus group were used to support findings from the previous interviews and, at the same time, add new information regarding the blended learning shared beliefs

and attitudes, leading to a new iteration of the findings chapter. Table 3 summarises the PLA techniques employed for each interview:

Table 3. PLA techniques used on each interview.

Interview	**PLA technique**	**Results**
Interview One: Focused Life History	River of Life	Explored personal experiencing and growth, and sought cues on early manifestations of the traits that characterise champions.
Interview Two: The Details of Experience	Community Mapping	Explored blended learning motivation in the context/boundaries of the University and the relationship between resources and the people involved in the blended learning adoptions.
Interview Three: Reflection on the Meaning	Focus Group	Circled back the findings and explored participants' shared perspectives.

To assure that the PLA techniques used would follow a consistent interview pattern, (all interviews would have the same procedure), the interviews were guided by a questionnaire consisting of sixteen questions inspired by Huang and Teo (2020), who conducted a similar qualitative study within Chinese universities. However, most of the questions were reframed to explore participants' experience and behaviour with the learning managing system, instead of the general use of technology as Huang and Teo (2020) did. Also, before its implementation and to increase the instrument's accuracy, the interview protocol was circulated among at least two identified experts in the field of research in educational technology. Considering that the university where the study was conducted (EMU) is currently operating in a blended learning model, the interviews were conducted either face-to-face or via Zoom meetings, according to each participant's preference. In both methods, the interview was

recorded mainly in audio and video used only whenever necessary, (for example when the participant wanted to show their drawings). In every case, the participants were well aware of the records and had signed the appropriate consent form that was handed in and explained before the interviews.

The data collected from the interviews (audio recordings and notes) were transcribed and analysed using thematic analysis as proposed by King et al. (2019) and aided by NVivo software,[5] a data management tool designed to assist in qualitative analysis. As all the participants were Portuguese-speaking, the audio recordings were first transcribed into Portuguese and analysed with NVivo. Only the emerging patterns, insights and extracts were translated into English for direct use in the study's manuscript. The initial proposed approach was that the analysis would be conducted using the translated transcripts (i.e., transcribed, translated and then analysed), but after transcribing the first set of interviews, it became clear to me that the thematic analysis with NVivo, should be conducted in Portuguese and only the findings and extracts should be translated into English for use in the manuscripts because there were many linguistic elements, such as interjections, phrasing, puns, historical cultural references, and other linguistic devices used to colour dialogue, that only made sense under the specific umbrella of Portuguese-speaking cultural background.

The analysis processes followed King et al.'s (2019) three-fold thematic analysis process:

- A preparation phase where the transcripts are coded according to the metadata specific to the research topic (in this case, seen through the lens of UTAUT2);
- An exploratory phase where previously coded data are grouped and linked to the research questions; and
- A final phase where visual representations are derived and the key themes are identified for further discussion.

The process is summarised in Figure 6 below:

[5] https://www.qsrinternational.com/.

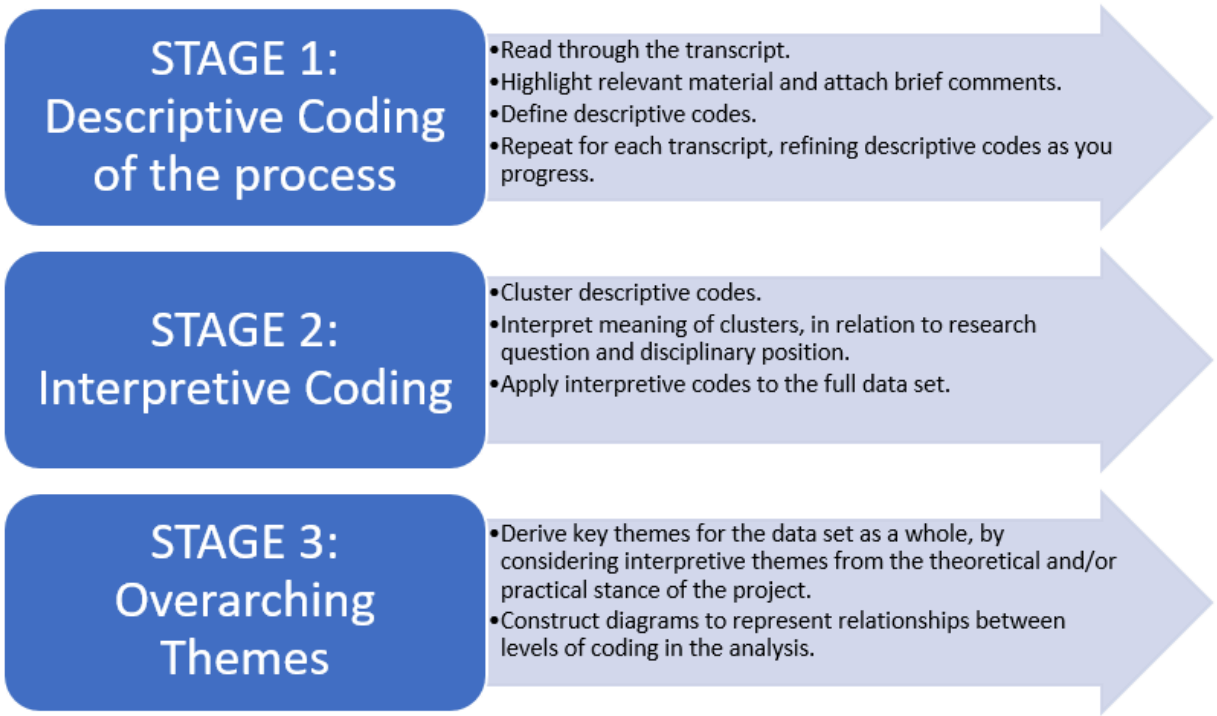

Figure 6. Summary of (King et al., 2019) data analysis process for qualitative research.

NVivo Software held a key position in the process, as it mediated each stage through its specialised subset of functions, adding the necessary automated quality checks in the process. A good example is the process of generation of mind maps and other visuals, word clouds and other visual representations of the analysed data, such as the example in Figure 7, where the coding panthers are hierarchically represented according to the number of references that emerged from all interviews, and Figure 8, where and NVivo report of a coding summary is shown.

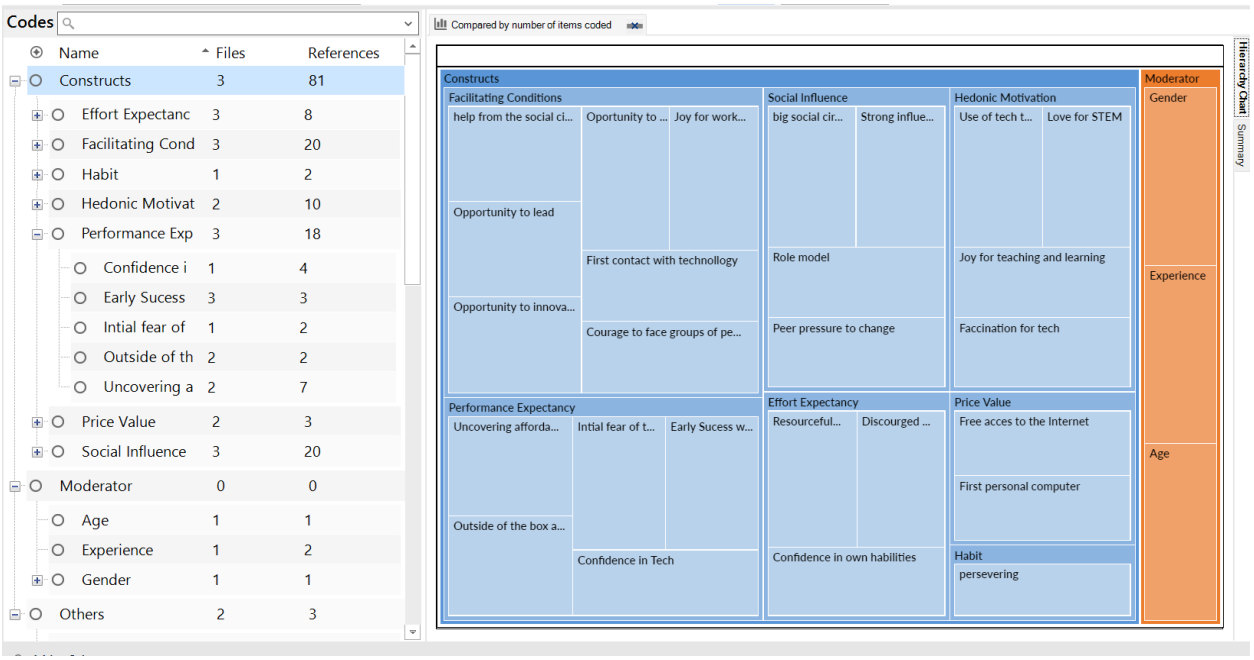

Figure 7. Data analysis coded patterns from NVivo.

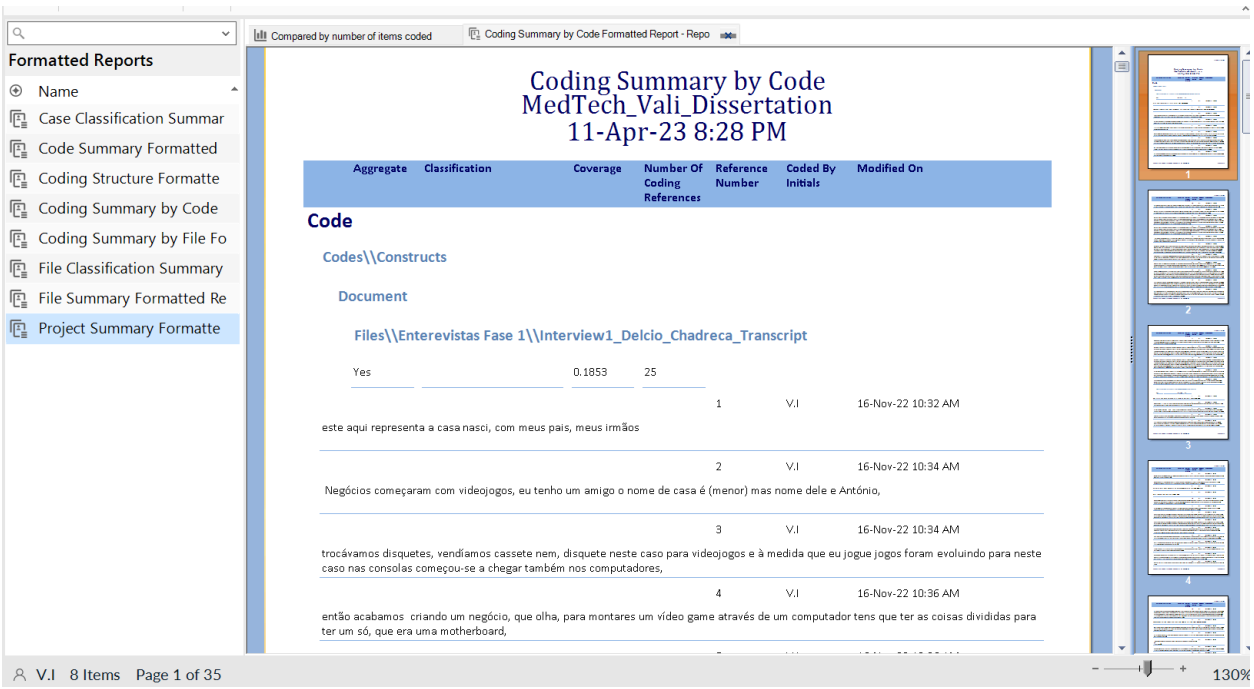

Figure 8. Data analysis coding summary generated by NVivo.

Trustworthiness

This study's quality is grounded in its adherence to principles of trustworthiness, which are central to qualitative research. I recognise that my positionality, which is shaped by my background, beliefs, and professional experiences, inevitably influences the research process. To address this, I engaged in reflexivity throughout the study, carefully considering how my perspectives might affect data interpretation and participant interactions. This approach helped ensure that potential biases were acknowledged and managed. As Holmes (2020) highlights, positionality influences all aspects of qualitative research. By acknowledging my own positionality, i.e. as a young, male lecturer, coming from a strong quantitative disciplinary background in Information Systems, moving into more qualitative research, I aimed to maintain transparency in the research process, understanding that my interpretations are shaped by both the participants' perspectives and my own. This practice contributes to the overall trustworthiness of the study, making the subjective nature of qualitative research explicit.

In this context, trustworthiness is ensured through credibility, transferability, dependability, and confirmability. Careful attention was given to data collection, analysis, and interpretation processes to reflect participants' perspectives authentically. To further enhance trustworthiness, specific strategies were employed in line with Shenton's (2004) guidelines, which emphasise the importance of these characteristics in qualitative research.

1. Credibility: The study was anchored in the robust theoretical framework of UTAUT2, which provided a structured approach to dissect complex issues into smaller, interconnected parts (refer to Figure 1 in Chapter 2). This framework offered a clear roadmap to navigate the complexities of the research topic, enhancing the credibility of the study.

2. Transferability: A three-interview protocol was used for data collection. The third interview was conducted as a focus group, ensuring that I accurately captured the participants' experiences and perspectives. This method not only served as a

triangulation strategy to validate the data but also provided ample opportunities for participants to offer additional feedback and corrections (participants' checks). This approach allowed for a rich, detailed description of the phenomenon under study, enhancing the potential for transferability of the findings.

3. Dependability: A meticulous data management plan was developed as part of the proposal that preceded this research, to outline the treatment of collected data. This plan was designed to prevent data degradation and potential misinterpretation, thereby ensuring the dependability of the research findings.

4. Confirmability: My deep involvement in the EdTech strategy at EMU was openly acknowledged, and steps were taken to ensure that the study findings emerged from the data and not from my own predispositions. This included using a three-interview protocol, with the third interview serving as a focus group. The participants were asked to review and comment on the transcripts of the previous interviews, as well as any preliminary findings or conclusions that I had drawn. This process helped in identifying any errors or omissions in the data. It also served as a review of my understanding of the participants' experiences.

By implementing these strategies, the study aimed to uphold the trustworthiness of the research, while acknowledging and addressing potential biases and challenges inherent in qualitative research.

Conclusion

This chapter described a systematic approach devised for the collection and analysis of pertinent data, which significantly contributes to the discussion in response to the primary and secondary research questions. I adhered to the research design outlined in this chapter and employed the UTAUT2 framework and design thinking mindset, as the research paradigms discussed in Chapter 3, for the critical collection and analysis of data. The subsequent chapter presents the findings derived from this rigorous process.

Chapter 4: Findings

Introduction

This chapter presents the findings of the data collection and analysis, and it is structured according to the three-staged interview protocol as framed by the research questions. The initial phase of the interview process introduces each participant individually, establishing a foundation for the subsequent exploration of their intrinsic motivations and defining characteristics. The findings from the second interview are informed by a combination of the research sub-questions with the frameworks described in the methodology chapter, the unified theory of acceptance and use of technology (UTAUT2), and merges the participants' perceptions based on their life experiences to draw a picture that expresses what made them blended learning champions. The presentation of findings paves the way for a thorough discussion in the subsequent chapter, Chapter 5 (Discussion). The diagram depicted in Figure 9, below, provides a summary of the entire chapter by highlighting the three distinct stages of interviews conducted, and outlines the key findings presented at each stage:

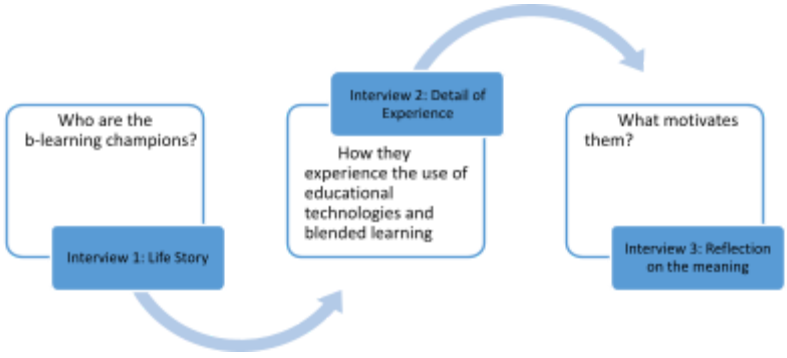

Figure 9. Stages of findings and discussion.

The structure of this research is designed to enhance our understanding of what motivates educators to become champions of blended learning. It does so by extending the unified theory of acceptance and use of technology (UTAUT2) with rich, qualitative data. While traditional technology acceptance models effectively measure factors affecting technology use, they do not fully capture the personal and

contextual experiences that influence how individuals interact with technology. This chapter first outlines the personal drives and characteristics of blended learning champions, then integrates these with UTAUT2's framework, aiming to provide a fuller picture of the forces behind educators' adoption of blended learning. This method aligns with design thinking mindset (DTM) characteristics, bringing a fresh perspective to technology acceptance studies by including the unique stories and viewpoints that shape technology use in education.

Following the aforementioned interview protocol, I engaged with each of the participants in two individual interviews, and all three in a focus group discussion, totalling six individual interviews and a focus group with an approximate duration of 60 minutes each. The table below (Table 4) provides a summary of the participants' descriptions according to the moderating variables of the UTAUT2 framework:

Participant	**Age**	**Gender**	**Teaching Experience (years)**
Maria[6]	Between 25 and 35	Female	8
João	Between 35 and 45	Male	15
Fernanda	Between 45 and 55	Female	23

Table 4. Participants' descriptions against UTAUT2 moderating variables.

As the table shows, the participants' ages ranged from 25 to 60, two were female and their experience level in teaching in higher education placed them between early career to senior academics. Because of confidentiality, the participants asked for non-disclosure of their exact age as this would be a good tell on who they might be for a reader who is familiar with EMU lecturers, hence, putting at risk the effort to preserve their anonymity. Names were also changed to provide anonymity. These three lecturers with whom I engaged in successive in-depth interviews provided invaluable input in relation to the UTAUT2 framework, as will be described in the next section. This was a direct consequence of the visual participatory action techniques

[6] Names changed to guarantee anonymity.

(Bozalek & Biersteker, 2010) used as data collection methodologies, as these caused participants to bring in fragments of the previous interview or move fluidly through past, present and future narratives.

Life Story: Let us meet the blended learning champions.

This first interview was intended not only to gather biographic information about the participants but also to draw a colourful picture of their personalities and how they became who they were. This was crucial for a nuanced understanding of each participant. It allowed for an appreciation of the individual's journey, their unique motivations, and how their experiences shaped their engagement with blended learning. Following is an initial incursion into the blended learning champions' life stories.

Maria

Maria is a female aged between 25 and 35 with 8 years of experience lecturing in the STEM field in the higher education system. She grew up surrounded by a big social circle and, from an early age, loved doing things collaboratively. With an innate drive to overcome personal limitations, Maria described herself as a shy person, although, since an early age, she took the initiative to lead and interact with groups of people and many times, in doing so, she would take for herself the responsibility of teaching and helping others, as usually happened in her father's backyard when her mates and siblings would join and study after school. Maria is a person who has loved STEM since childhood and she has, throughout her life, been impacted by role models that were either lecturers or professionals from the STEM field. As a resourceful person, she has found herself in groups that would innovate, with plenty of good examples from different moments of her life. She was part of the first study group to find and use a computer to write a Geography report about coastal erosion (with pictures) in a high school where almost nobody knew about the availability of a perfectly functioning computer; she was in the group of lecturers that first adopted an LMS to teach in STEM courses in the university; and later, she joined a group of software developers that created the first Mozambican business simulator. Maria is a

person who values teamwork, collaboration and generosity, perseverance and sees technology as an enabler despite the challenges that it brings into people's lives.

João

João is a male aged between 35 and 40, with 15 years of experience lecturing in the STEM field in the higher education system. He described himself as someone who grew up in a supportive family surrounded by brothers, sisters and cousins and grew used to group interaction.

João is a modest person but fully aware of his potential, has an innate drive to help others and has an acquired passion for teaching. He values playfulness and fun in everything he does and this has been part of his life since early on, when he engaged in radical sports and video game competitions. In fact, since early childhood and throughout his adult life, João would simultaneously engage in various groups of interest for playing, studying or working. This easiness with group engagement introduced him to the world of video games and he remembers that, when he was a pre-teen he was always seen as the go-to person to engage in video games. This would happen at school, in the neighbourhood and with his extended family. With the help of a lifelong friend, who would show him how to talk to people and find opportunities, João developed a taste for entrepreneurship and became an informal business maker, selling video games and computer parts. This was happening during his teenage years and way before he got to university. His friend turned out to become a full-time businessman. Reflecting on that part of his life, what João realised is that much of the success he and his friend had was due to the time and attention they devoted to teaching their clients how to assemble the parts they sold, how to identify the best components and also how to do clever tricks in the games they sold. In retrospect, João said that people would come to him and his friend because of the teachings they provided alongside the products they sold.

Having a supportive father was a big part of his personal development. João recalled with joy that when he turned 21, he had enough money to buy his first car, but he also knew that it was sensible to think about paying for his graduate course. He went

to his father who told him that, as long as he kept learning and improving, he should not worry about paying for school, and, then, he bought his first car. He added that this episode made him feel capable and made him value his own efforts even more.

For João, digital technologies shaped the way he sees the world and educational technologies came naturally to him. In fact, he was the first to adopt simulation software in his subject because he felt that, because of the scarce material resources to teach the subject, his students did not have the opportunity to fully understand what it meant to deploy a complex computer network.

He is supportive of his students and believes in their potential. He says that the current generation of students are misunderstood by their lecturers because they are digital natives and have an entirely different way of giving significance to the world. João cannot think about teaching without using digital technologies and sees blended learning as an opportunity to make students work in a trusting environment.

Fernanda

Fernanda is a female aged between 40 and 60 with 23 years of experience lecturing in the STEM field in the higher education system. She presented herself as someone who came from a family of lecturers, citing examples like her father, uncles and grandfather. For Fernanda, being a lecturer was part of her identity since, from early childhood already, she admired her relatives who were lecturers and/or teachers. Attraction to the character of the lecturer did not come only from her family. Fernanda told us that she was particularly impressed by a teacher she had in primary school because of the immense empathy they had for their learners. For example, whenever a student missed school, this teacher would send someone to check on the learner and make sure that everything was ok. As a child, Fernanda suffered from respiratory problems and her teacher would pay constant attention to her wellbeing (as well as the other learners') and would send her back home if she did not bring warm clothing during winter. Fernanda added that, over the years she would look for this kind of lecturer and that this would make her recognise teaching as a noble occupation.

Gender rules enforcement was an important part of her education in a traditional family; hence, despite her incontestable interest in STEM, Fernanda was discouraged by her family. But, being a strong-minded person, she challenged her family and made her way to an engineering faculty where she was one of the few women enrolled and the only one in her department. Reflecting back on that, Fernanda said that the discouragement would also come from faculty members and fellow students, as they would repeatedly tell her to go home and get married, and that some university lecturers would display anger toward women whenever they were pursuing engineering. Nevertheless, the fact that she took on the challenge changed the minds of her relatives, who became fully supportive. Also, a selected number of lecturers at the university had a supportive and protective attitude towards women, and that was enough for her to make it to the end. To Fernanda's surprise, once she finished the graduate course, she was invited to join the department, making her the youngest lecturer there and the only woman, which was a great boost to her confidence and ability to face social challenges. Fernanda explained that, from there, challenging the status quo, protecting minorities and looking for opportunities to improve and excel in STEM became second nature.

From the initial description of the three participants, it is starting to make sense in light of the literature previously discussed, that they indeed meet the description of blended learning champions with their consistent passion for technology and a keen enthusiasm for guiding and encouraging peers in their blended learning endeavours. From their life stories, one can tell that the support of family, friends and colleagues was an important *facilitating condition* at every stage of their lives. Another characteristic of an e-learning champion predicted by the design thinking mindset is the willingness to dive into the unknown, a pattern also visible among these blended learning champions. Good examples of mindset are when Maria voluntarily took on the responsibility of leading the class whenever their teacher was absent (in high school); when João engaged in all sorts of activities and groups seeking new experiences; and when Fernanda challenged her family tradition and set out to be the first female engineer in her community. However, how educational technologies

and blended learning came to play a central role in their lives was explored in the details of experiences in the following section.

Details of Blended Learning Experiences: How their experience with educational technologies evolved and how they experience blended learning.

To better explore the blended learning champions' experience with educational technologies, the findings are framed under the research sub-questions and the emerging patterns are aligned with the UTAUT2 constructs that showed as carrying more meaning for the participants.

Blended learning champions' perception of educational technologies acceptance: Exploring *performance expectancy* (PE), *effort expectancy* (EE) and *price value* (PV)

When looking at blended learning champions' perceptions and how educational technologies and blended learning improve their lives (*performance expectancy)* and whether it was a worthwhile goal (*effort expectancy)*; *performance expectancy* showed as being the stronger motivator of the two, and this was visible throughout their lives because they consistently chose the path that would increase their potential in whatever they did. We saw that Maria, who, even before getting to high school, and while studying in a school with technological resource scarcity, went to all lengths to challenge the odds and bring the first-ever assignment written and formatted on a computer (see Comment 1) - much to her teacher's and classmates' amusement. Similarly, when João had just joined the department as a lecturer and decided that it was time to try and use PowerPoint presentations, he related that this was at the time, in the 90s, when computers were viewed as scary machines at the university, and the norm was to write with chalk on a blackboard or, for the most innovative lecturers, to use retro overhead projectors with acetate transparencies (see Comments 2 and 3).

> *Comment 1:* "…and then he [the lecturer] stood there with the most puzzled gaze we had ever seen, without understanding how it was

possible [having a printed essay with actual pictures of the riverbank that was eroding nearby].” (Maria)

Comment 2: “… I would go from classroom to classroom carrying that huge cathode-ray tube monitor to use in my presentations, and, when other lecturers walked by my classroom, they would come back, pause and look at the scene, puzzled and maybe wondering what that little girl was doing with that odd machine in front of the students (*nostalgic sigh*).” (Fernanda)

Comment 3: “…and we ended up creating a small business while we were still teens because we taught ourselves how to assemble computers and video game consoles.” (João)

What stood out when the blended learning champions reflected on the use of technologies, in general, and educational technologies, in particular, was that technologies enhanced and/or amplified the possibilities of obtaining the best possible outcomes. We saw this in childhood examples, as when João was in his teens and followed the passion of gaming as a means of earning money, but also and, above all, the same pattern was found in their adult lives as lecturers. João, for example, saw EdTech as a means to increase his presence with his students (see Comment 4), and the same happened with Fernanda, who saw EdTech as the only way for her to care for the particular needs of her students (See Comment 6).

Comment 4: “…and also the lecturer has a lot more presence when using these tools. It’s like having a superpower or being omnipresent for my students!” (João)

Comment 5: “Many think that a physical lab is better… [but] in a digital lab we can do infinite simulations without spending additional resources and only take the best simulations to the physical lab. Students feel safer that way because they know that there is no risk of damaging the equipment.” (João)

Comment 6: "…we have large classes and we are few [lecturers], but, with the blended learning approach, no student falls behind…" (Fernanda)

Blended learning champions take EdTech so seriously in relation to their ability to perform that when asked about the possibility of teaching without EdTech and with only face-to-face classes (no blend), they all were emphatic in saying that it was now an unthinkable possibility for them:

Comment 7: "I don't see how I could do that! (*Laughing*) Maybe I'd have to quit! Stopping using [blended learning] will bring many more problems than if we deal with the challenges of continuing..." (Maria)

Comment 8: "Do what?! (*Laughing out loud*)." (João)

Comment 9: "The traditional approach nowadays is not enough. I wouldn't be doing my job." (João)

From the above, it was evident that, for blended learning champions, *performance* was key. This point of view made them weigh the effort (EE) to achieve this performance not as a means to an end but rather as part of the process of technology adoption. This meant that, in relation to *effort expectancy*, blended learning champions did not see aspects like learning curve and price as something that they have to "suffer" in exchange for increased performance. The effort was instead seen as part of the process:

Comment 10: "I don't think there is an effort, because the reward is much greater…" and "… (things) related to STEM and educational technologies came naturally as well…" (Maria)

Comment 11: "…we had everything there in front of us to be able to give our best…" (João)

Comment 12: "Preparing a transparency is harder than preparing a PowerPoint presentation and delivering a PowerPoint presentation is less efficient than creating activities that engage the students with the learning

process, and once you design the activity it stays there in the platform to be used again with next students and this makes more time for the lecturer to improve." (João)

Another important pattern regarding *effort expectancy* was that, for blended learning champions barriers were seen as opportunities. Although they highlighted the need for institutional support (for example better computers, faster internet and training) they did not put too much emphasis on that, but rather called upon themselves and their colleagues to find modest but effective ways to overcome the barriers:

Comment 13: "…and there's no sense in not using [the blended approach] because we don't have the perfect resources. It would just be postponing dealing with the problem… it's like stopping in time but you know that time doesn't stop…. Even using my personal resources, I feel like I'm winning." (Maria)

Comment 14: "Many times I feel that a significant portion of the hurdles I'm facing can be addressed with what I already have at my disposal. The problem is that I see many people trying to do everything at once…. Me.. I do things gradually and persistently…." (Maria)

Comment 15: "… and small things can have a huge impact. For instance, instead of buying last-generation computers for the department and failing on it because of lack of money. Why not just increase the memory capacity and implement a solid maintenance routine? The price of one last-generation computer could revitalise an entire computer lab." (João)

Comment 16: "The management is there busy worrying daily about our salaries, electricity, water, now COVID, and the list never ends! So it's up to us to show them how change and improvement can be made without making all systems fall into pieces." (João)

Blended learning champions showed a clear understanding (see Comment 17) that technologies and innovation required resources and personal commitment, (*price*

value). However, it was also visible (Comments 18, 19 and 20) from the data that blended learning champions equated *price value* in an entirely different scheme in a sense that, for them, when addressing *price value*, the monetary cost (*price value*) was not the whole equation, because, for them, it was also, and mainly, about what it took for their student to succeed. This was evident when they had, in some cases, reportedly focused on the success of the student at the cost of personal sacrifices. A good example was when João noticed that one of his students was lagging. He approached the student. Upon discovering that the student's computer had been stolen, João reached out to his friends and borrowed a computer which allowed his student to continue to study. (This story was reported by Maria). Similarly, Joao and Maria, at some point, mobilised their colleagues to collectively pay for an LMS server for the department so that everyone could experiment and learn about it.

> *Comment 17:* "Nowadays, and even so, after we had to deal with COVID-19, everybody sees clearly that teaching is impossible without material and human resources." (João)
>
> *Comment 18:* "Before complaining and raising more problems you have to ask yourself why are doing it? Why did you become a lecturer in the first place?!" (Maria)
>
> *Comment 19:* "Not all students have the possibility to connect from home [explaining that lecturers should leave the computers to be used by the students on campuses]. When the lecturer spends time and resources investing in improving his teaching capabilities and classes he is, in fact, investing in himself and in society… These students will, in the future, make serious decisions with impact on our lives, so we have to prepare them for that…" (João)
>
> *Comment 20:* "Let's not forget that the focus is on the students. They have to be served and, with this in mind, the lecturer never sees difficulties." (João)

To summarise how blended learning champions viewed *perceived performance, effort e Expectancy and price value* when adopting educational technologies, the analysis of the interviews showed that *performance* is the dominant theme for

blended learning champions: They viewed educational technologies and blended learning as having boundless potential, and for this reason, blended learning champions treated *effort expectancy* as just "part of the process. For blended learning champions, the focus was not on the technology itself nor on material resources, but rather on improving their student's learning experience, and that was why blended learning champions did not establish a strong link between price and motivation (Gachago et al., 2017).

Facilitating conditions and *social influence* for blended learning adoption: Exploring organisational and personal factors

The successful adoption of blended learning in educational institutions is influenced by several factors, including the availability of *facilitating conditions* and the impact of *social influence*. In this section, we will examine how blended learning champions perceived organisational and personal factors and how these factors influenced their attitude toward adoption. When asking blended learning champions to reflect on how the organisational environment impacted (in positive or negative ways) their efforts to adopt educational technologies for blended learning, three main themes emerged, namely, top-level management, policy, and funding.

Starting with the role of top-level management, which is described as the people who are responsible for strategic decisions, our blended learning champions diverged on the perceived importance that these managers have for the daily effort of implementing blended learning. On one hand, Maria felt misunderstood because the management did not seem to grasp how deeply important it was to transition to blended learning. For Maria, the understanding of the blended learning approach was that it should be well rooted in the top-level management so that the people in the field (lecturers) bore less daily friction (Comment 21). As for João, he disagreed with Maria, but only in the sense that, for him, managers had to be shown what came next and only then, managers would mobilise the *facilitating conditions*, João added that it was up to the lecturers to do the research. João saw the top-level management as the key to change because they were the voice of command and, as such, should be at the forefront of blended learning adoption (Comments 22 and 23).

Comment 21: “...at the time [at the peak of COVID-19], the lecturers were given a lot of freedom to experiment and conduct the process of educational technology adoption…[but] now it feels like nobody from the top-level management is showing face in straight defence of blended learning adoption…” (Maria)

Comment 22: “We have to present blended learning and educational technologies in terms that resonate with common sense…[and] the lecturers have to research and experiment!” (João)

Comment 23: “...the middle managers [course conveners] morally support blended learning and EdTech implementation but they don’t have the actual power to make [structural] decisions.” (João)

As for university policies, all interviewees agreed that, although the policy was an intricate part of any efficient organisation, it tended to stand in the way when it came to making structural changes. In effect, all participants assessed the current policy as being in dire need of a complete review, and at the core of all this was the fact that EMU had, for more than 50 years, been firmly oriented to the face-to-face mode of provision. Because of this, everything was tailored accordingly: how students were taught, how they were evaluated and, above all, how lecturers were assessed by the University.

Comment 24: “…the curriculum and syllabuses are still face-to-face… we experimented during the pandemic but, after that, everything seemed to be forbidden.” (Maria)

Comment 25: “…we are like disciples! The policies are there and we just have to follow them… policies are the driving force of an organisation but they have to leave room for some innovative flexibility at the department level.” (João)

Comment 26: “…policy has to favour the implementation of new teaching practices. This has to be part of the policy itself.” (João)

Finally, on the theme of funding, besides what was explored on the previous topics (see Comment 17), what transpired on the theme of funding was that blended learning champions saw it as an essential component, as funding could provide opportunities for professional development and training for lecturers to use the technology effectively in the classroom. The blended learning champions agreed that lack of funding could be a major barrier to adoption and could hinder the potential benefits of educational technology for learners and educators alike. Moreover, these champions were proactive in their approach; even in the absence of sufficient funding, they took the initiative to develop a plan to overcome financial barriers and ensure the successful implementation of blended learning strategies. This demonstrated their commitment to advancing educational technology, regardless of financial constraints.

> *Comment 27:* “The computer lab is used for teaching too, so the students who don’t own a computer have nowhere to go and practice or access the learning management platform. This might discourage them.” (Maria)
>
> *Comment 28:* “The classrooms are not motivating for collaboration and creativity. Even at the kindergarten, for example, the classrooms are tailored to enrich children's experience. At the university, the same line of thought should be followed and design the face-to-face interactions that much the collaboration that happens online.” (João)
>
> Comment 29: “… [giving an example] If we need to buy a simulation software, the course convener will encourage us, but the final decision is made by managers, and many times, the managers don’t even teach and, therefore, they prioritise the allocation of resources in a different way.” (Fernanda)

Despite the challenges presented above, blended learning champions were not deterred by a lack of funding or management support, as they leaned towards a strong sense of group support. Blended learning champions saw collaboration,

generosity and peer support as a way to catalyse growth as well as to make it easier to face challenges.

> *Comment 30:* “I'm here reminding myself that I never liked to study alone … I don't know if it was because I had a very close community, but I always studied with neighbours, with fellow learners, with cousins and brothers… and even now as a lecturer, I have a group of colleagues who think alike and are eager to support each other.” *(*Maria*)*

> *Comment 31:* “We are inserted in a social context and the academic environment is part of it, so we have to create harmony so that the best possible outcome is reached in favour of our students.” (João)

> *Comment 32:* “…that is why it is so important to have this spirit of mutual support among colleagues and also to engage in ideas with colleagues studying or researching in other universities [because they are exposed to different realities].” (Fernanda)

But what really stood out in terms of *social influence* was that blended learning champions saw students as an integral part of the ecosystem, and as active members of the academic community with the power and willingness to participate in the change process, and this being so, the blended learning champions did not feel pressured to get everything right on the first attempt; they rather felt confident to make mistakes and improve, both in relation to the students as well as to their fellow lecturers.

> *Comment 33:* “…if I am a lecturer, it means that I am fully committed to learning and experimenting to improve my profession.” (Maria)

> *Comment 34:* “…at present, it feels like a lot relies on students’ motivation… [they are] our most valuable asset … I even had situations of students who presented their assignments online connecting from a crowded train.” (João)

Comment 35: "…you see, for the students, everything is always new… they are the ones who usually dare to try new things and we should let them…" (Fernanda)

To summarise how blended learning champions perceived *facilitating conditions* and *social influence*, the data showed that blended learning champions had a strong perception of the importance of having institutional support for innovation (in this case blended learning) and blended learning particularly brought up the role of top-level management as a key part of the transformation. Blended learning champions understood that policy was fundamental for the university but they felt that it was time to reframe the current university policy because what was officially declared (written and approved) still pointed towards a face-to-face approach, although almost everyone at the university agreed that blended learning was the way to go. Finally, blended learning champions acknowledged the important role that funding had for the continuous improvement of the teaching and learning process but they did not see funding as the most important motivator, instead, blended learning champions relied on peer support and saw experimentation collaboration and generosity as the only sustainable way to implement change. They valued collaboration not only with their peers but also with the students because blended learning champions saw their students as the most valuable asset to catalyse change.

Influence of *age*, *gender*, and *experience* on blended learning champions' motivations towards educational technologies adoption

In the literature review (Chapter 3), *age*, *gender* and *experience* were seen to be variables that moderate the constructs from UTAUT2, like the ones presented above in this findings chapter. It was necessary to see whether, for the context of our blended learning champions' perceptions, *age*, *gender* and *experience* variables carried any weight and for that, this section re-uses some of the findings already presented and, at the same time, adds more extracts from the interviews, as needed.

This study took a qualitative approach, looking at *gender* and *age* as parts of a larger intersecting narrative. It moved beyond analysing these factors in isolation, weaving them into the life stories of the participants to understand how they influenced and interacted with each other. The real contribution of this research lay in its holistic view, showing how these elements came together to form the unique experiences of each individual, and, in turn, their approach to blended learning. This painted a comprehensive picture, offering richer insights into the motivations and challenges of blended learning champions.

Examining the narratives, it became clear that personal factors like *gender* and *age* wove into the participants' experiences in a meaningful way. *Gender*, for example, emerged as an influential theme through the stories of female participants, particularly in discussions about support systems and the social dynamics they navigated. These insights revealed the subtle, yet significant, ways in which these personal attributes shaped their engagement with the educational environment. Throughout their lives, people around them did not initially show trust in their potential to perform well in the STEM field (see Comments 36 and 37). The shared perception (between the two female participants) was of not belonging or of being unworthy in the eyes of their peers because they identified as women and were in the STEM field. However, their stories did not show any evidence that *gender* affected the participants' own motivation, which is to say that, although support from their respective communities did not come promptly, these blended learning champions found their own way to express themselves, changing minds in the process (possibly because they were challenged?).

> *Comment 36:* "I was the class captain and it was the science field, imagine, we were just 5 girls in a class of 50 boys and boys are never, let's say, sitting and listening to a girl talk…" (Maria)

> *Comment 37:* "When I went to university to take an engineering course, everyone pointed out to me that it would be better to cancel the enrolment, go home and get married because engineering is not for women. I remember thinking that they could even be right because I saw a few colleagues there

who had already been there for many years and never got out of engineering school and some lecturers were so mean to women." (Fernanda)

Comment 38: "... [the first time] I entered the classroom [as a lecturer], I saw the group that was waiting for me, 70% of them were my former fellow-students and the class was entirely composed of men …. I couldn't move for a few seconds… I taught my classes and on the last day of the semester they all said they were very happy and that I had the calling to be a lecturer…" (Fernanda)

Regarding the aspect of *age*, there appeared to be a subtle link with the perception of how university management and policy supported the participants, known as *facilitating conditions*. It appeared that the older the participant, the higher the perceived importance of managers and policy for the adoption of deep-rooted changes with university-wide impact such as blended learning. It is also interesting to mention that one participant additionally revealed that, from what she experienced during the peak of COVID-19, she saw that *age* was not a factor to be taken into consideration seriously. Contrary to what was usually perceived, junior lecturers were struggling to find the motivation to adopt technologies to deal with the emergency, while senior lecturers reacted energetically in adopting new teaching methods and technologies.

Comments 39: "During the pandemic crisis, many senior lecturers fought to adapt and quickly learn to use EdTech, while some youngsters just laid back quietly, just lurking. What really matters is having the calling and wanting to stay young in the career". (Fernanda)

Conclusion

This chapter outlined the experiences and perspectives of blended learning champions, highlighting their resilience, adaptability, and commitment to student success in the face of technological and institutional challenges. Their journeys, marked by a blend of personal and professional elements, showcased how intrinsic factors, like early experiences, attitudes towards innovation, and individual resolve,

played a crucial role in navigating the complexities of blended learning and educational technology adoption. The insights gathered not only underscored the importance of institutional support and policymaking in *facilitating* this shift but also revealed the nuanced ways in which the participants saw themselves leading change. As we move forward to the discussion in Chapter 5, these findings will be instrumental in understanding the deeper implications of these motivations and challenges, providing a richer context to the overarching narrative of technology integration in educational settings.

Chapter 5: Discussion

Introduction

This chapter discusses the findings on the adoption of educational technologies for blended learning by innovation champions, referred to in this study as blended learning champions. The analysis explores how the design thinking mindset complements the UTAUT2 framework within traditional technology acceptance research (TAR). Key themes include motivating factors, facilitating conditions, social influence, and the impact of gender, age, and experience on technology adoption. By connecting the findings with relevant literature, this chapter provides insights into the drivers of successful adoption and how a design-thinking mindset can enhance the understanding of TAR.

Summary of findings

- Blended learning champions equate blended learning and the use of educational technologies with an increase in their performance.
- The challenges of adopting blended learning and EdTech, such as the steep learning curve, scarcity of technological resources, deficient helpdesk support, and others are well-documented (Cheung et al., 2018; Heilporn et al., 2021), and seen by the blended learning champions as part of the process and as things that should be accepted as a collective challenge that has to be faced both individually and as a group.
- The Literature Review highlighted the critical role of institutional factors like policies, organisational culture, and funding in the successful adoption of blended learning and educational technologies (Bervell et al., 2021; Naidoo & Singh-Pillay, 2020). The champions' recognition of these factors reinforces the necessity of supportive organisational environments for driving innovation in teaching and learning.
- Blended learning champions do not link *price value* directly with the actual cost of implementing change, but rather with their student learning outcomes. For

blended learning champions, student success is prioritised over cost, although they are mindful of the financial challenges of implementing blended learning and adopting EdTech. As discussed in the Literature Review, the shift towards student-centred teaching has been a significant driver for the adoption of educational technologies (Tsai et al., 2021; Pinto & Leite, 2020). The findings here align with this shift, as blended learning champions prioritise student success over financial costs, emphasising the educational value of technology.

- As explored in the Literature Review, early experiences with technology play a crucial role in shaping educators' attitudes towards technology adoption (Tondeur et al., 2017). The champions in this study confirm this, highlighting how their upbringing and early professional experiences influence their current engagement with educational technologies.

- *Experience* and *age* are not seen as negative influencers, since blended learning champions are eager to learn and experiment with innovation regardless of their age and/or if they have previous experience with new technologies and methodologies.

- Gender brought particular challenges to the female participants of the study, as they both experienced initial distrust from their peers regarding the fact that a female was championing technologies. In this regard, the Literature Review discussed how gender dynamics influence technology adoption in educational contexts, with female educators often facing unique challenges (Sailors & Hoffman, 2019; Muianga et al., 2019). The experiences of the female blended learning champions in this study reflect these broader trends, yet also highlight their resilience in overcoming gender-based barriers.

    - The initial distrust of the female participants from peers about being technology champions was not a deterrent for these blended learning champions. Rather, it was something they were able to overcome through the DTM characteristic of reflection and resilience.

The insights gained from the blended learning champions are examined through the lens of the technology acceptance model (TAM) and design thinking mindset (DTM) characteristics. Comparing their real-world experiences against TAM and DTM allowed an analysis of how the barriers to, and enablers of, technology adoption align with these frameworks. Exploring where the findings converge and diverge from TAM and DTM presented an opportunity to determine how integrating aspects of each approach could better promote technology adoption. This discussion of the champions' experiences against TAM and DTM could ultimately inform future strategies and interventions that leverage the strengths of both to facilitate more widespread and effective adoption of blended learning technologies.

Connecting the Dots: to see how UTAUT2 and DTM characteristics complement each other

Connecting the dots, it becomes visible that UTAUT2 and the characteristics of a design thinking mindset (DTM) complement each other in the context of educational technology adoption. While UTAUT2 provides a structured framework for understanding user behaviour and technology acceptance, DTM characteristics offer a more holistic perspective that encompasses collaborative, empathetic, and problem-solving approaches. These two approaches together shed light on the complex motivations and behaviours of individuals adopting educational technologies, emphasising the importance of not only *performance expectations* but also *social influence*, *facilitating conditions*, and *hedonic motivations*. The synergy between these frameworks enhances our understanding of what drives technology adoption in educational settings, as shown below.

Research Sub-question 1: What are blended learning champions' perceptions of educational technology acceptance, specifically exploring *performance expectancy, effort expectancy* and *habit*?

The Focus on Practice in a design thinking mindset encourages blended learning champions to engage in hands-on learning and experimentation with new educational technologies. This active engagement increases their confidence and

perceived ability to use these technologies effectively, which, in turn, positively influences their *performance expectancy*—the belief that technology will improve their teaching—which, to some extent, reinforces the notion of *experience* as defined by (Venkatesh, 2013) and previously discussed in this chapter demonstrating that the literature supports that Focus on Practice enhances lecturers' perceptions of performance improvement through the use of educational technologies. Through practical application, blended learning champions also gain a clearer understanding of the technology's potential benefits and drawbacks, further encouraging adoption. See Figure 10, below, the main relationship between Focus on Practice and *performance expectancy*.

The Problem Orientation of a design thinking mindset resonates with the blended learning champions' motivations, aligning with the UTAUT2's construct of *effort expectancy*. João, for instance, advocates for a mindset that embraces innovative solutions to overcome obstacles, reflecting a willingness to exert effort to adopt new perceptions and to present educational technologies in a relatable way. As explored in the Literature Review, effort expectancy is a crucial factor in technology adoption, with studies like Venkatesh et al. (2003) highlighting its impact on perceived ease of use. The current findings expand on this by illustrating how a problem-oriented mindset can enhance lecturers' willingness to invest effort in adopting new technologies. This problem-solving attitude, reinforced by collaboration and empathy, can enhance individuals' motivation to adopt technology by reframing challenges as opportunities for innovation; see Figure 10, the main relationship between Problem Orientation and *Effort Expectancy.*

Learner Empathy within the design thinking mindset is another key motivator. It drives instructors to prioritise the learning experience and outcome of their students, thereby increasing the perceived value of technology in teaching. This empathy enables instructors to better understand and cater to student needs, leading to the selection of technologies that add value to the educational experience for both lecturers and students; see Figure 10, the main relationship between Learner Empathy and *Price Value*.

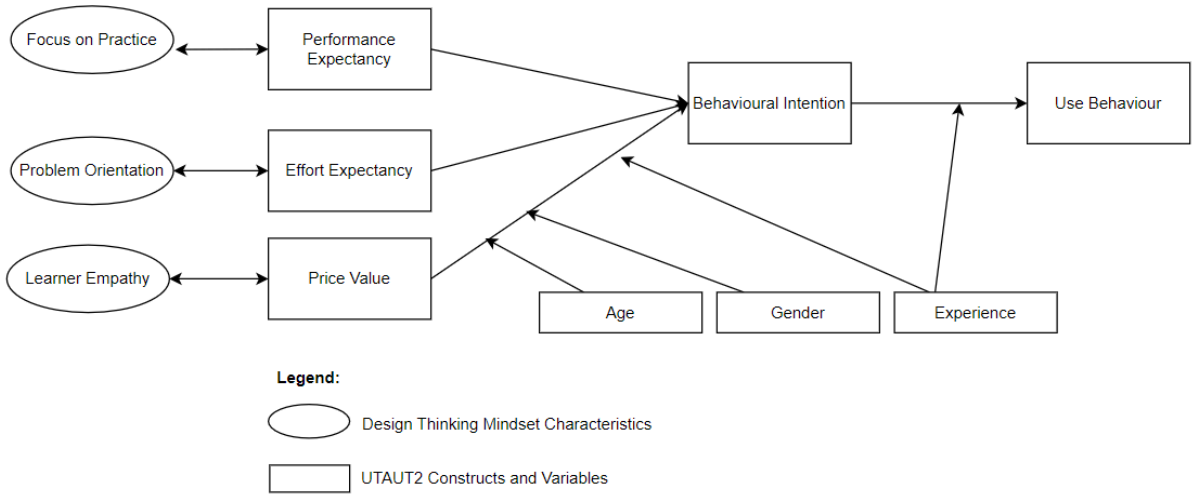

Figure 10. Participants' descriptions against UTAUT2 moderating variables.

The integration of the design thinking mindset with UTAUT2 constructs—namely *Performance Expectancy, Effort Expectancy,* and *Price Value*— shows how a hands-on, empathetic, and problem-oriented approach can amplify the perceived effectiveness, ease of use, and value of educational technologies, thereby fostering a more enthusiastic adoption among lecturers.

Research Sub-question 2: How do the *facilitating conditions* in the participants' surroundings (personal and organisational) affect them when adopting blended learning?

Motivation among blended learning champions is driven by the design thinking mindset characteristics of Collaboration and Generosity, which have a direct impact on their adoption of blended learning and educational technologies. This principle fosters a collaborative and supportive environment among colleagues, promoting positive behaviour and intentions. Blended learning champions find themselves part of a community working towards a common goal—successful blended learning and educational technology implementation. Furthermore, involving students in this collaborative process generates a positive *social influence* on the adoption of new technologies and teaching practices; see Figure 11, below, the main relationship between Collaboration and Generosity and *Social Influence*.

Moreover, the collaborative and generous spirit motivates blended learning champions to form *habits* related to educational technology use. This mindset encourages blended learning champions to seek and receive *social influence* from their peers, ultimately fostering a supportive environment where *habits* related to technology adoption can flourish; see Figure 11, the main relationship between Collaboration and Generosity and *Habit*.

As change agents, blended learning champions are motivated by their active role in driving the adoption of educational technologies and blended learning practices. They see themselves as catalysts for change, advocating for the necessary *facilitating conditions* to support technology adoption, and creating a positive social influence within their academic communities. Embracing the mindset of change agents, blended learning champions take the initiative in identifying and addressing the *facilitating conditions* required for successful technology adoption. Their proactive approach influences social norms and behaviours, inspiring their peers and colleagues to also embrace change, and actively contribute to creating the necessary *facilitating conditions*. See Figure 11, the main relationship between Change Agents and *Facilitating Conditions*.

The design thinking mindset characteristic of Exploration and Play encourages blended learning champions to approach educational technologies with curiosity and openness, leading to a positive *hedonic motivation* to use them. By embracing exploration and play, blended learning champions actively seek out new technologies, tools, and teaching methods, which enhances their perception of *facilitating conditions*, such as the availability of resources and support. The enjoyable and engaging nature of Exploration and Play contributes to their overall satisfaction with the technology adoption process, reinforcing their positive *hedonic motivation* to continue using educational technologies; see Figure 11, main relationship between Exploration and Play and *Hedonic Motivation*.

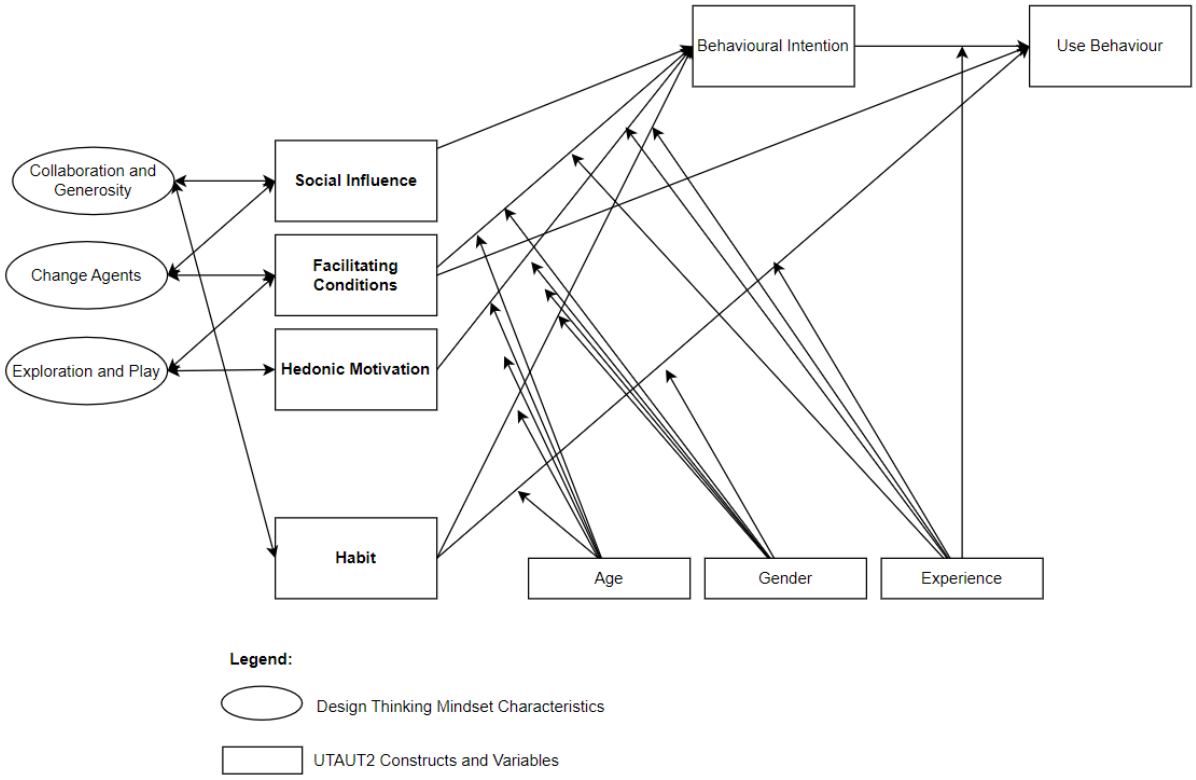

Figure 11. Relationship between UTAUT2 (SI, Hedonic Motivation and Habit) and DTM characteristics (Collaboration and Generosity, Change Agents and Exploration and Play).

Research Sub-question 3: What is the impact of *age, gender,* and *experience* on the motivations of blended learning champions towards the adoption of educational technologies?

The motivations of blended learning champions towards the adoption of educational technologies are influenced by a combination of *age*, *gender*, and *experience*, but not in the traditional sense, as suggested by the unified theory of acceptance and use of technology 2 (UTAUT2). Traditional models, like UTAUT2, posit that these variables act as predictable moderators of technology adoption, with younger men, for example, often being more inclined to embrace novelty and innovation due to their tendency to seek out new experiences (Venkatesh et al., 2012). The current study

challenges some of these assumptions by showing that blended learning champions use these characteristics as catalysts for adoption, rather than as barriers.

The data indicate that blended learning champions utilise their *age*, *gender*, and *experience* as assets to propel themselves forward in the adoption of educational technologies. Contrary to the expectation that these factors might limit their willingness or ability to engage with new technologies, blended learning champions reflect on their unique attributes, and leverage them to their advantage. This reflects the design thinking mindset (DTM) characteristic of Reflection and Resilience, as they are mindful of their potential and limitations, and choose to act positively upon them.

For instance, an older blended learning champion may use their wealth of experience to provide a nuanced perspective on the integration of technology in education, engaging their knowledge to navigate and mitigate potential challenges. Similarly, female blended learning champions may draw on their gendered experiences to foster inclusive learning environments that utilise technology to cater to diverse student needs. In both cases, these champions are not hindered by their *age* or *gender*, but, rather, use these aspects of their identities to inform and enhance their approach to technology adoption.

Furthermore, the DTM characteristics encourage blended learning champions to reflect continuously on their practices and to be resilient in the face of challenges, which aligns with Schweitzer et al.(2016) and Bervell et al. (2020). This mindfulness allows them to recognise the dynamic interplay between their personal attributes (*age*, *gender*, *experience*) and their professional goals, thus enabling them to adapt and thrive in the ever-evolving landscape of educational technologies The relationship is illustrated in Figure 12.

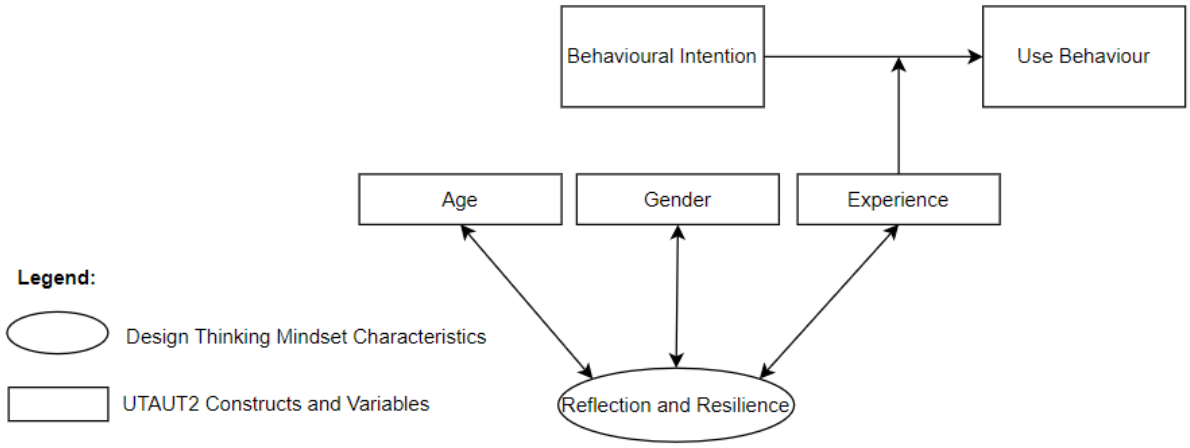

Figure 12. Relationship between UTAUT2 variables (Age, Gender and Experience) and DTM characteristics (Reflection and Resilience).

In essence, the impact of *age*, *gender*, and *experience* on the motivations of blended learning champions is significant but operates differently than traditionally anticipated. These champions do not conform to the expected moderating effects of these variables. Instead, they are attuned to the DTM characteristics, which help them turn these characteristics into drivers for positive change and innovation in the realm of blended learning.

Can Design Thinking Mindset Characteristics Support Technology Acceptance Research?

Design thinking mindset (DTM) characteristics can indeed lend significant support to technology acceptance research (TAR), particularly through their human-centred approach that acknowledges the complex and layered nature of technology adoption. The initial interaction of constructs within TAR and DTM, as illustrated in Figure 13, indicates a potential for a symbiotic relationship. This suggests that the characteristics of DTM could offer valuable insights and frameworks that complement the TAR models.

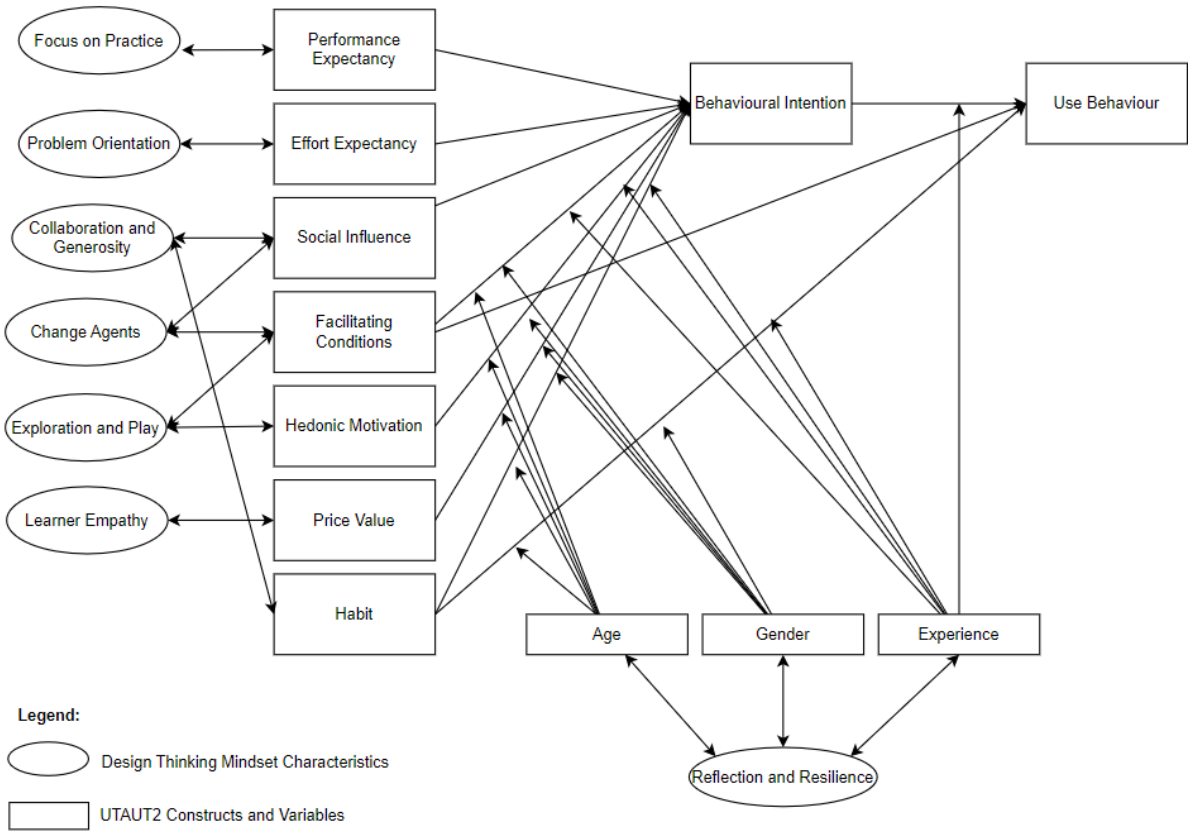

Figure 13. Integration between all UTAUT2 and all DTM characteristics.

However, it is important to recognise that the current data and findings supporting this symbiotic relationship are primarily drawn from the subset of individuals known as blended learning champions—those who are inherently motivated and equipped to drive the adoption of blended learning and educational technologies. In their case, the DTM characteristics align well with their intrinsic motivation and outlook, which facilitates the adoption process.

Expanding beyond this specific group, the literature (Gachago et al., 2017; Rauth et al., n.d.; Warrick, 2009) indicates that this symbiotic relationship could be fostered more widely through the development of a championship mindset. This mindset is characterised by an adaptable and flexible perception of reality, as opposed to a rigid and fixed viewpoint. In such a mindset, an individual's *age*, for example, is not seen as a definitive barrier to learning new technologies but rather as a variable that can

be navigated and potentially leveraged. Similarly, when assessing *facilitating conditions*—a concept from TAR—DTM characteristics encourage a broader view that transcends the mere presence or absence of certain factors. Instead, they promote an appreciation for the individual's capacity to overcome barriers and seize opportunities, thereby turning challenges into stepping stones for successful technology adoption.

In essence, the DTM characteristics provide a lens through which technology acceptance can be viewed as a dynamic and interactive process, influenced by personal characteristics and environmental factors, and the interplay between the two. This perspective enables a richer, more nuanced understanding of TAR, where the individual's capacity for reflection, resilience, and creativity plays a pivotal role. The model will hold true and be most effective when the individuals involved—whether researchers, practitioners, or end-users—embrace these characteristics and apply them to the complex task of technology acceptance and adoption.

Integrating design thinking mindset characteristics with the UTAUT2 framework has the potential to enhance the latter's capability to identify and understand the role of champions in technology acceptance. This integration would broaden UTAUT2's scope and reach, enabling it to capture the full spectrum of human dynamics that drive technology acceptance. Such an enriched model would be more equipped to predict and explain the variance in technology adoption behaviours, particularly in scenarios where champions play a critical role, ultimately leading to more effective strategies for implementing educational technologies.

Chapter 6: Conclusion

Introduction

We draw this study to a close by synthesising our main findings within TAR, particularly through the lens of the UTAUT2. The research has focused on what enabled three lecturers from Eduardo Mondlane University to adopt blended learning practices.

We map these findings against the established research aims and questions, delineating the significant contributions of the DTM characteristics as a possible complement to enhancing the UTAUT2 model. This study extends the discourse in technology acceptance by integrating DTM characteristics, demonstrating their broader implications not only for UTAUT2 but for TAR, at large. Finally, we critically examine the study's limitations and open a dialogue on the avenues for future research. By doing so, we aim to offer a comprehensive perspective that acknowledges the complexity of the subject, while setting a path for continued exploration in the ever-evolving landscape of educational technology.

Summary of Findings

This study embarked on an exploration to understand the motivational factors propelling lecturers at Eduardo Mondlane University to adopt blended learning, focusing on a unique cohort of educators, designated in this study as blended learning champions. Nestled within the expansive domain of TAR, the UTAUT2 served as our theoretical compass. Yet, we ventured beyond traditional analytical bounds by employing DTM characteristics to provide fresh perspectives on the motivations of these lecturers, who are excelling in blended learning adoption.

Central to our inquiry was the inherent human-centredness of DTM characteristics, which added an unconventional qualitative approach to TAR, grounded in a series of six in-depth interviews and a focus group, as inspired by Seidman (2013). This methodological approach sought not only to capture the essence of what fuelled the

blended learning champions but also to assess whether the integration of DTM characteristics could enhance or deepen the insights provided by traditional TAR frameworks, in this case, UTAUT2.

Our findings draw a distinct profile of the blended learning champions: individuals who derive their values and motivations intrinsically. Their pedagogical beliefs and relentless pursuit of positive change stand as the primary catalysts for their actions. Consistent with the literature on innovation champions (Warrick, 2009) and e-learning champion proponents (Gachago et al., 2017), these educators exhibit a mindset that is pivotal to their navigation within the organisational milieu. This mindset, particularly the design thinking mindset, characterised by traits like empathy, problem-solving and agency for change, is revealed not as a static attribute but as a dynamic continuum. The champions view themselves not as innately predisposed to such a mindset but as continuously evolving entities. This dynamism, they attribute to an interplay between their early life experiences and their current endeavours in surmounting the hurdles of technological adoption and broader institutional change.

How do blended learning champions perceive the usefulness and ease of adopting the educational technologies in their classrooms (*performance expectancy*, *effort expectancy*, *habit* and *price value*)?

The findings from our in-depth interviews and focus group with blended learning champions at Eduardo Mondlane University reveal a distinctive perception of educational technology acceptance. Blended learning champions associate the adoption of educational technologies with a tangible improvement in teaching performance. This perception is not dampened by the challenges they face; rather, they view these challenges as collective hurdles to be overcome through group effort, embodying true design thinking mindset (DTM) characteristics.

In terms of *performance expectancy*, blended learning champions believe that educational technologies enhance their ability to teach effectively. They are driven by a hands-on, practice-oriented approach that boosts their confidence and perceived competence with these technologies. This aligns with UTAUT2's vision that

performance expectancy is a strong predictor of technology use (Venkatesh et al., 2012).

When considering *effort expectancy*, our blended learning champions employ a problem-oriented mindset. They are willing to put in the necessary effort to adopt new technologies, viewing obstacles as opportunities for growth and innovation. This reflects a broader interpretation of *effort expectancy*, which not only encompasses the ease of using technology but also includes the champions' readiness to tackle problems creatively.

Lastly, the *habit* of using educational technologies among blended learning champions is not merely a routine but is intertwined with their identities and pedagogical beliefs. Their commitment to student success and belief in the transformative power of technology form the backbone of their habitual use of educational tools. This suggests that, for blended learning champions, *habits* around technology use stem from a deep-rooted empathy for learners and a desire to constantly improve the educational experience.

In essence, the blended learning champions at Eduardo Mondlane University perceive the acceptance of educational technologies as a dynamic interplay between the perceived benefits to their *performance*, the effort they are willing to invest, and the ingrained *habits* that reflect their deep pedagogical values and beliefs. These perceptions are profoundly influenced by the human-centred characteristics of DTM, which suggests that incorporating such characteristics into TAR models could provide a more comprehensive understanding of technology acceptance in educational settings.

How do the *facilitating conditions* in the blended learning champions' surroundings (personal and organisational) affect them when adopting blended learning?

In our exploration of the impact of *facilitating conditions* on the adoption of blended learning by blended learning champions, a nuanced understanding emerged. These individuals recognise the need for standard *facilitating conditions*, such as internet, computers, helpdesk support and so forth, but, through their design thinking mindset,

they demonstrate a unique response to deficiencies in these *conditions*. They exhibit learner empathy and problem-solving and act as change agents, showcasing an adaptive approach to overcoming institutional limitations.

Blended learning champions at Eduardo Mondlane University do not passively accept suboptimal *conditions*; instead, they proactively seek to improve the learning environment for their students. They assume responsibility for enhancing the status quo, viewing it as their obligation to assist the organisation in fostering a more supportive setting for blended learning.

This proactive stance extends to their perception of *price value*. Unlike the traditional TAR and UTAUT2 frameworks, which consider *price value* as a trade-off between cost and technological benefits (Venkatesh et al., 2012), blended learning champions evaluate *price value* through the lens of student success. They prioritise educational outcomes over cost, indicating that the integration of a design thinking mindset could offer a more sophisticated perspective on how lecturers assess the value of educational technology investments.

The study suggests that by adopting the characteristics of design thinking—emphasising empathy, problem-solving, and a willingness to champion change—TAR could gain a deeper insight into the economic assessments of lecturers. Blended learning champions view the adoption of technology not just in terms of personal or immediate gains, but in the broader context of student success and long-term educational transformation.

What is the impact of *age*, *gender*, and *experience* on the motivations of blended learning champions towards the adoption of educational technologies?

The motivations of blended learning champions at Eduardo Mondlane University towards adopting educational technologies are not dictated by *age*, *gender*, or *experience* in isolation. Instead, these factors serve as diverse backdrops that enhance the champions' drive for innovation. The study reveals that *age* is not a barrier but a stage for leveraging accumulated knowledge. *Gender*, particularly for female champions, while presenting certain societal challenges, also fuels a drive to

foster more inclusive learning environments. *Experience*, whether vast or limited, is a platform for continuous professional growth.

Our blended learning champions use their unique life attributes as assets to push educational technology forward. An older lecturer may employ a wealth of experience to guide technology integration in a pedagogically responsible manner, while female lecturers use their perspectives to create more inclusive environments. These champions transform what may traditionally have been seen as limitations into strengths that inform their approach to adopting technology.

In this light, the characteristics of the design thinking mindset—reflection, resilience, and empathy—empower blended learning champions to transcend conventional limitations associated with demographic factors. They continuously reflect on their practices, resiliently adapt to challenges, and empathetically consider their students' needs, which drives their motivation beyond typical expectations. The impact of *age*, *gender*, and *experience* is thus, significant, but operates differently from traditional models, turning these characteristics into catalysts for positive change in educational technology.

Theoretical Contribution

The interplay between technology acceptance research (TAR), specifically the unified theory of acceptance and use of technology 2 (UTAUT2), and design thinking mindset (DTM) characteristics, is revealed as a dynamic and symbiotic relationship through this study. The findings suggest that integrating DTM characteristics with UTAUT2 can not only enhance the existing TAR framework but also provide a more holistic understanding of the user's acceptance as a personal journey.

Blended learning champions at Eduardo Mondlane University demonstrate how this integration can occur in practice. The human-centredness of DTM characteristics (emphasising empathy, problem-solving, and a hands-on approach) complements the structured analysis of technology acceptance provided by UTAUT2. When champions face challenges, the reflective and resilient nature of their DTM encourages a proactive reaction, transforming obstacles into opportunities for innovation and

growth. This mindset is crucial for understanding how individuals interact with technology beyond the constraints of traditional models.

For instance, the UTAUT2's constructs of *performance expectancy*, *effort expectancy*, and *price value* are deepened when seen through the DTM characteristics lens. Champions' hands-on experience and empathy towards learners amplify the perceived effectiveness and value of technology, leading to a richer, more engaged form of technology adoption. Similarly, the concept of *facilitating conditions* is expanded beyond institutional support to include the champions' capacity to inspire change and create an environment conducive to educational innovation.

This study has shown that the DTM characteristics of empathy, collaboration, and exploration and play can enrich TAR's predictive power. This enriched framework would not only forecast technology adoption more accurately but would also provide insights into how to nurture and develop technology champions within educational institutions (Rauth et al., 2010). By deepening the understanding of the individual context and human aspects of technology use, such as relationships, motivation, and creativity, we can foster a more adaptable and inclusive approach to educational technology acceptance, ultimately supporting the development of educators who are as proficient with technology as they are passionate about teaching. The table below summarises the consolidated model presented in Figure 4 in the discussion chapter and suggests how DTM characteristics engage with different aspects of UTAUT2 for enhanced adoption of blended learning.

Table 5. Consolidated design thinking mindset characteristics combined with UTAUT2 constructs.

DTM characteristics	UTAUT2	Why	How
Collaboration and Generosity	*Social Influence and Habit*	DTM characteristics can foster collaboration and *social influence* to encourage technology adoption.	By *facilitating* group work and promoting technology use in team projects
Learner Empathy	*Price Value*	DTM characteristics can help identify the practical benefits of technology adoption to improve *price value* perception among lecturers.	By understanding lecturers' needs and showing how technology meets them
Problem Orientation	*Effort Expectancy*	DTM characteristics can help identify and overcome barriers to technology use to improve *effort expectancy*.	By carrying out user interviews to identify challenges and find solutions
Exploration and Play	*Hedonic Motivation* and *Facilitating Conditions*	DTM characteristics can encourage experimentation and play to improve *facilitating*	By making technology use engaging and playful, and offering interactive tutorials

		conditions for technology adoption.	
Reflection and Resilience	*Behavioural Intention* and *Use Behaviour*	DTM characteristics can promote reflection and resilience to improve *behavioural intention* and *use behaviour*.	By providing feedback mechanisms for users to reflect on their experience and continuously improve
Focus on Practice	*Performance Expectancy*	DTM characteristics can help identify user needs and expectations to improve *performance expectancy*.	By aligning the technology features with the expectations and requirements of the users
Change Agents	*Facilitating Conditions* and *Social Influence*	DTM characteristics can empower change agents to improve *facilitating conditions* and *social influence* for technology adoption.	By providing them with necessary resources and promoting their successes to others

In light of these combinations, new opportunities emerge for TAR. For instance, looking at Collaboration and Generosity combined with *social influence,* if UTAUT2 finds significant *social influence* factors that can be improved, DTM characteristics will help in understanding how or why. For example, by checking how lecturers collaborate and help each other with blended learning adoption, DTM characteristics

will deepen the value of the insight already gained with UTAUT2 and also stimulate the positive aspects found that will enhance s*ocial* i*nfluence*, creating a virtuous cycle. Another good example of the opportunities that emerge is that, by employing the DTM characteristics to understand how lecturers currently engage with educational technology to improve their student outcome (learner empathy), the need of the individual in context will emerge and will be used to improve UTAUT2 p*erformance* e*xpectancy*. To inform *effort expectancy*, the problem-orientation principle can be used to identify and address common barriers to technology adoption and the same line of thought could be applied to the rest of the combinations. Simply put, UTAUT2 will help in measuring the key factor for technology adoptions (the who and what) and, informed by UTAUT2, the DTM characteristics will help in understanding the results from the individual's perspective and finding the means to challenges identified (the why and how) as shown in Figure 14, below:

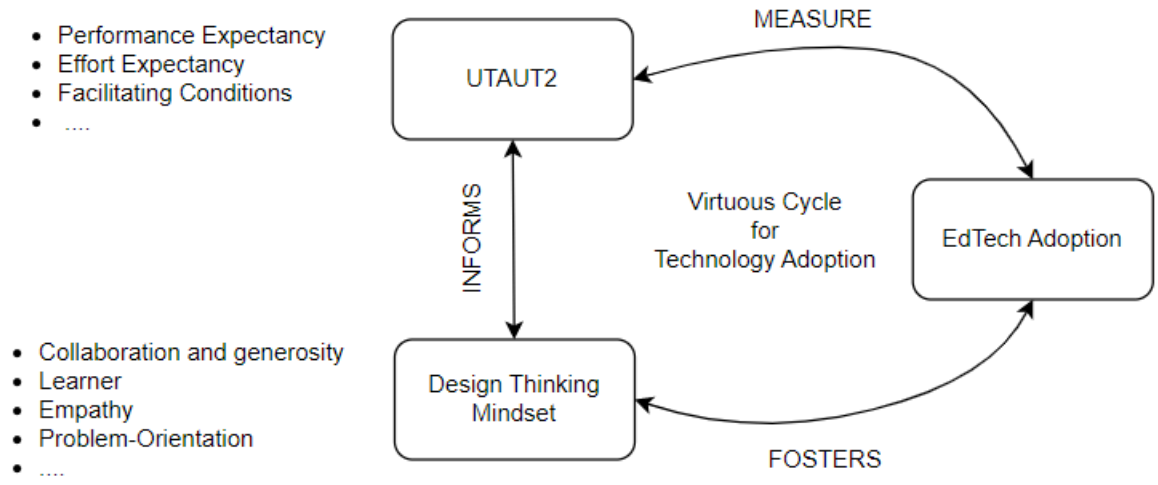

Figure 14, The virtuous cycle of technology adoption.

As the figure illustrates, this is a symbiotic relationship, since, as Doyle et al. (2019) highlighted, one of the biggest challenges of the human-centred design approach is that, measuring the impact of mindset may prove elusive, hence the interventions

and interactions at the individual level may be informed by the measurements deployed by UTAUT2 at the collective level, creating a virtuous cycle that improves the success of technology adoption initiatives.

Another visible consequence of combining UTAUT2 with DTM characteristics is that, if we consider that, traditionally, UTAUT2, in particular, and TAR, in general, usually employ a quantitative approach, it gives valuable insight into the collectiveness (or, one could say, at the organisational level), while, at the same time, DTM characteristics, as a human-centred approach, move towards the adopter as an individual. That being said, it is possible, when looking at Figure 14, to devise a continuum that links the two views, i.e., Organisational and Personal, as illustrated in Figure 15.

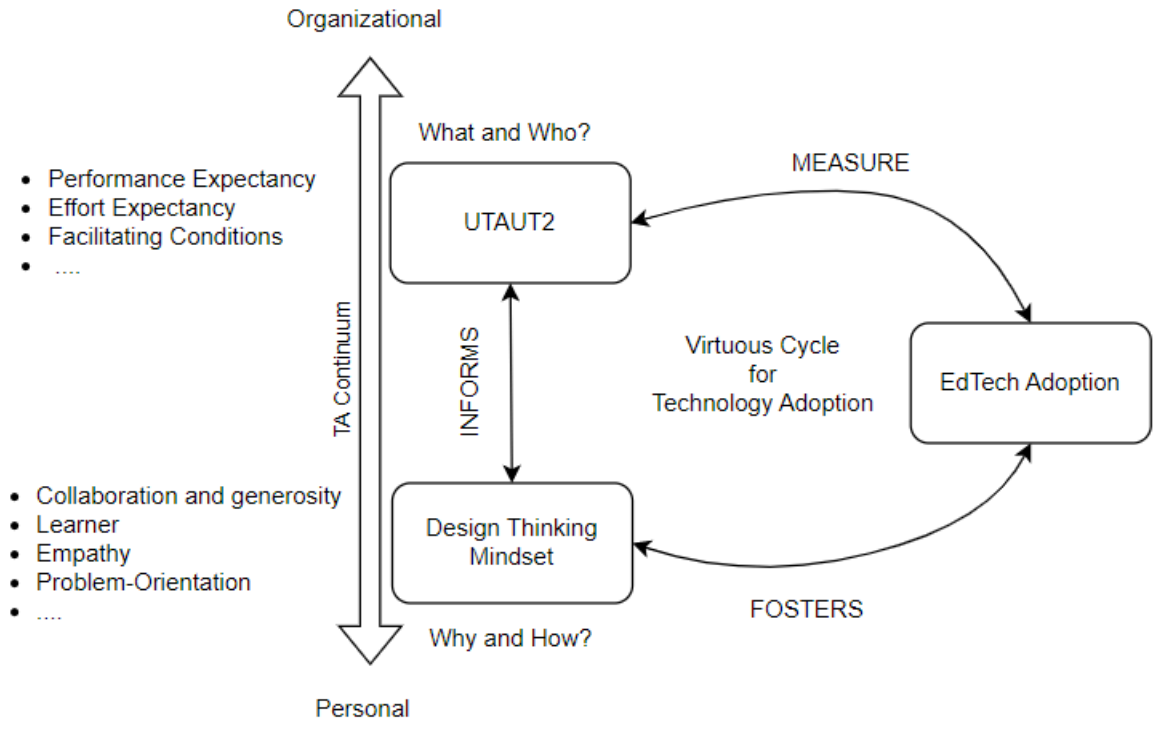

Figure 15. The virtuous cycle of technology adoption continuum.

Returning the conversation to the innovation champions, in this case, the blended learning champions, it follows that understanding the champions can further

strengthen the human-centred approach in combination with UTAUT2, as blended learning champions can have a significant impact in the adoption of blended learning by promoting a culture of innovation and experimentation within the educational settings. Understanding the blended learning champions' motives and actions through DTM characteristics will then inform the technology adoption research model (UTAUT2), increasing the chances of success of the implantation of educational technology for blended learning.

Limitations of the Study

While the study was structured with a significant level of thoroughness, there were certain constraints that are important to acknowledge.

The number of participants was limited due to the requirement of conducting six in-depth interviews per individual and a focus group, following Seidman's (2013) protocol. This requirement made it challenging to find participants with the availability for such a time-intensive process. It is important to remember that these participants are not only highly functional but also active lecturers, whom we fittingly call blended learning champions. This limitation, however, was also a strength in some respects, as it allowed for a more profound engagement with each participant, enabling me to move beyond the superficial and explore the deeper motivations and personal stories of the blended learning champions.

Another notable limitation was the homogeneity in the participant pool, with all individuals hailing from the STEM field. This could lead to assumptions that the participants were naturally inclined toward technology, which, while partially true, did not detract from the study's exploration into deeper motivational factors driving the adoption of technology for educational excellence. It is crucial to understand that the study's findings on motivation extend beyond a mere affinity for technology to encompass a whole range of personal experiences of our blended learning champions on technology adoptions. It is also interesting to point out that, when looking superficially, one of our participants easily fits into the stereotype of the

tech-averse senior lecturer and, only after a closer look at this participant's trajectory, impact and personal beliefs a true change agent is revealed, a champion.

Now, the thing with champions is that focusing solely on champions may not produce a universally applicable model. The champions, by their very nature, are outliers whose practices and motivations may not reflect those of the broader teaching community. This concentration on a niche group limits the generalisability of the results; however, it is a firm ground for finding the way towards the development of new champions, which is, in itself, a positive contribution to the proposed model.

The educational setting of the study also presents a limitation for generalisation. Lecturers often operate under a strong sense of mission, which may not be present in other professional settings. This sense of mission was particularly evident in how the blended learning champions perceived *price value*—not just as a trade-off between costs and benefits but in direct relation to student success. This finding, while significant, speaks to a context where dedication to student success can sometimes overshadow institutional limitations, a situation that might not be mirrored in less mission-driven environments, so caution is advised when generalising.

The linguistic aspect of the study was also challenging. Conducting interviews in Portuguese and then translating only key patterns and insights for the manuscript might have led to the loss of nuanced language-specific meanings. While the in-depth nature of the interviews aimed to mitigate these losses, there is a recognition that a different set of insights may have emerged had the data collection and analysis been conducted entirely in one language, either English or Portuguese.

Another interesting point, already raised in the research design chapter, is the potential for researcher bias. The characteristics and motivational factors prompting me to engage with this subject were akin to those identified in the participants, raising an epistemic challenge. The recognition by participants of me as a potential blended learning champion reflects a shared passion and vision, which, while validating, could also colour the interpretation of findings. From the onset of the study, I acknowledged this close connection to the subject and maintained transparency throughout the

research process. This was explicitly stated in the methodology to address potential biases. The third interview with participants was used as an opportunity for them to review and confirm the findings, thus ensuring participant validation of the data. I also rigorously followed the predefined theoretical framework for data interpretation, which helped to minimise personal biases and bolster the study's credibility.

Despite these limitations, there is a degree of optimism grounded in the literature on innovation champions, which suggests that such individuals are prevalent across various settings. Their drive and passion for change can often surmount the barriers that may hinder the more widespread adoption of educational technologies.

Future Work

To broaden the understanding of what motivates educators to adopt blended learning, future research should expand the scope of inquiry to include lecturers from a diverse array of disciplines beyond the STEM fields. Engaging with educators in humanities, arts, and social sciences will offer a richer, more nuanced perspective on the universal applicability of the design thinking mindset characteristics and the motivations for educational technology adoption across varied academic landscapes.

In line with this expanded scope, a deeper exploration into the demographic factors that may influence the adoption of educational technologies, is also essential. A study that includes a balanced mix of genders, ages, and levels of experience could reveal additional layers of complexity regarding how these factors intersect with individual motivations and institutional cultures.

Additionally, a comparative study across different educational institutions could provide valuable insights into how contextual factors, such as, institutional resources and support systems, influence the adoption of blended learning. By contrasting environments with varying levels of resource availability, researchers can further elucidate the interplay between institutional support and individual initiative in technology adoption.

Furthermore, acknowledging the potential for researcher bias is crucial. Future studies should employ reflexivity to assess how a researcher's experiences and perspectives might shape the research outcomes. Incorporating methods, such as, peer debriefing and collaborative research, could provide a buffer against individual biases, ensuring a more balanced and objective analysis.

Lastly, there is a compelling need to test the proposed model of technology acceptance that integrates the design thinking mindset characteristics to see to what extent it will help decision-makers and practitioners in boosting technology acceptance, in general, and blended learning adoption, in particular. This endeavour would not only extend the theoretical frameworks of technology acceptance, but also offer practical guidance for educational institutions aiming to foster a culture of innovation and technological adaptability.

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Appendix A - Ethical clearance letter

SCHOOL OF EDUCATION

Dr Carolyn McKinney
Associate Professor

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Physical address: Neville Alexander Building, University Ave South, Upper Campus
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EDNREC20220605

28 June 2022

Valli Issufo ISSVAL001

MEd

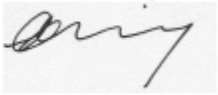
Dear Valli Issufo,

Re: Ethical Clearance for Research Project

I am pleased to inform you that ethical clearance has been granted by the School of Education Research Ethics Committee of the Faculty of Humanities for your research project entitled: 'Factors motivating lecturer's uptake of blended learning at Eduardo Mondlane University.'

I wish you all the best with your study.

Yours sincerely,



Associate Professor Carolyn McKinney
Chair - School of Education Research Ethics Committee

Appendix B Information sheet for lecturers

LECTURER INFORMATION SHEET

Dear Mr/Mrs_____ ,

Research title: Factors motivating lecturers' uptake of blended learning at Eduardo Mondlane University

I, Vali Issufo, am a researcher based at the School of Education at the University of Cape Town and a lecturer at Eduardo Mondlane University. I would like to ask your permission to carry out my research on the factors motivating lecturers' uptake of blended learning at Eduardo Mondlane University. My research aims at exploring the factors that motivate lecturers, specifically those defined as 'early adopters', to adopt educational technologies at EMU, with a specific focus on VULA, the university's Learning Management System (LMS).

While there is a growing body of research on educational technology adoption (TA) in Higher Education Institutions, there is a relative lack of research on TA studies that explore the individual in a specific context and delve into the complexities of TA among lecturers in resource scarce contexts such as Mocambique.

Data collection will be in the form of three scheduled interviews which will last between 30-60 mins and will be separated by 2 to 3 weeks each. In each interview, the interviewee will reflect on the same questions, but from different perspectives, so that opportunity is given for context exploration and gradual reconstruction of the participant's experience across time. The interviews will be recorded in audio, transcribed and finally circled back to the participant for validation and ethical consideration.

Your participation is voluntary and your confidentiality is guaranteed. You will be given a pseudonym (different name) and pseudonyms will be used for all participants in the writing up of the research. The audio recordings will not be disclosed during the research or in the future under any circumstance, except with your explicit written permission.

You may withdraw permission to participate in the research at any time.

Please fill in the slip below to indicate your consent for the research. You are welcome to ask any questions regarding this research by telephone or email: vali.issufo@uem.mz/vali.issufo@gmail.com or (+258) 848663015.

Yours sincerely,

Mr. Vali Issufo

Appendix C Informed consent form for lecturers

LECTURER CONSENT FORM

Research title: Factors motivating lecturers' uptake of blended learning at Eduardo Mondlane University

I agree to participate in this study.	YES ☐ NO ☐
I understand why I am participating in this research.	YES ☐ NO ☐
I consent to be interviewed.	YES ☐ NO ☐
I consent that my interviews will be audio recorded	YES ☐ NO ☐
My concerns and questions about the project have been addressed.	YES ☐ NO ☐
Confidentiality I acknowledge that the research project will de-identify me and my department/ course and redact ("delete") details to obscure my identity.	YES ☐ NO ☐
Identification I wish to be identified in the following way within research outputs: If you would like to choose your own pseudonym, please indicate below: _____	A preferred pseudonym ☐ The researchers' choice of pseudonym ☐
I agree to be directly quoted in the research in line with my preference above.	YES ☐ NO ☐
I agree for artefacts created by me during sessions to be used in line with my preference above.	YES ☐ NO ☐
Research publication I am aware that the research will be published in academic journals. Researchers will be able to publish from this data, individually or with others.	YES ☐ NO ☐
Possible Harm I have been informed that there is little or no risk related to this study.	Initial:

I understand that I am participating voluntarily and I may withdraw at any time without prejudice. (I understand I am free to leave the study at any time.)	Initial:
I have not been offered any reimbursement for participating in this study.	Initial:

Researcher:	**Participant**
Name: …… …	Name: …… ……..
Signature:…… ……	Signature:…… ……..
Date:…… ……	Date:…… ……..

Appendix D Interview 1 Guide: Focused Life History with "River of Life"

Preparation

- Welcome and Introduction: Start with a brief introduction about yourself, the study, and the goals of the interview.
- Confidentiality and Consent: Emphasise the confidentiality of their responses and confirm their consent.
- Overview of the River of Life Technique: Introduce the "River of Life" exercise, explaining its purpose to map out their life and professional journey, especially in relation to educational technology.

Setting Up the River of Life Exercise

1. Materials Preparation: Ensure that the participant has a large sheet of paper and coloured pens or markers.
2. Instruction for the River of Life: Instruct the participant to draw a river on the paper, starting from the earliest point in their life they wish to begin with, flowing towards the present day. The river should include significant events, experiences, and turning points in their life, especially those relevant to their career and use of educational technology.

Conducting the River of Life Exercise

3. Drawing the River: Give them 15-20 minutes to draw their "River of Life." Encourage creativity and the inclusion of symbols, key events, people, and experiences.
4. Discussion of the River: Once completed, ask the participant to explain their drawing, starting from the early stages and moving progressively to the present. Encourage them to elaborate on each significant point, particularly those that relate to their experiences with blended learning and educational technology.

Main Interview Questions (Aligned with the River of Life)

1. Early Influences and Experiences: Explore the early parts of the river, focusing on what initially shaped their views on education and technology.
2. Path to Blended Learning: Discuss the points in the river where they began to engage with blended learning.
3. Challenges and Successes: Identify and discuss the rapids or smooth bends in the river, signifying challenges and successes in their journey.
4. People and Events: Ask about key individuals or events represented in the river that influenced their adoption of educational technology.

Exploring UTAUT2 Variables Through the River of Life

5. Performance Expectancy, *Effort Expectancy*, Social Influence, *Facilitating Conditions*: Use elements from their River of Life to discuss these UTAUT2 constructs and how they have impacted their technology adoption journey.

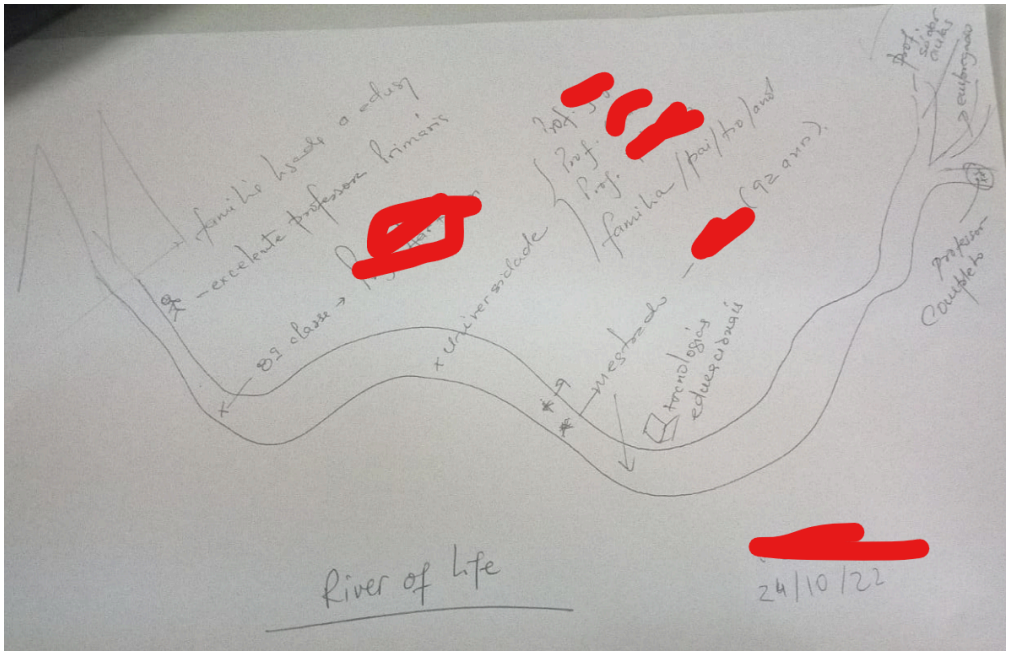
Reflective and Closing Questions

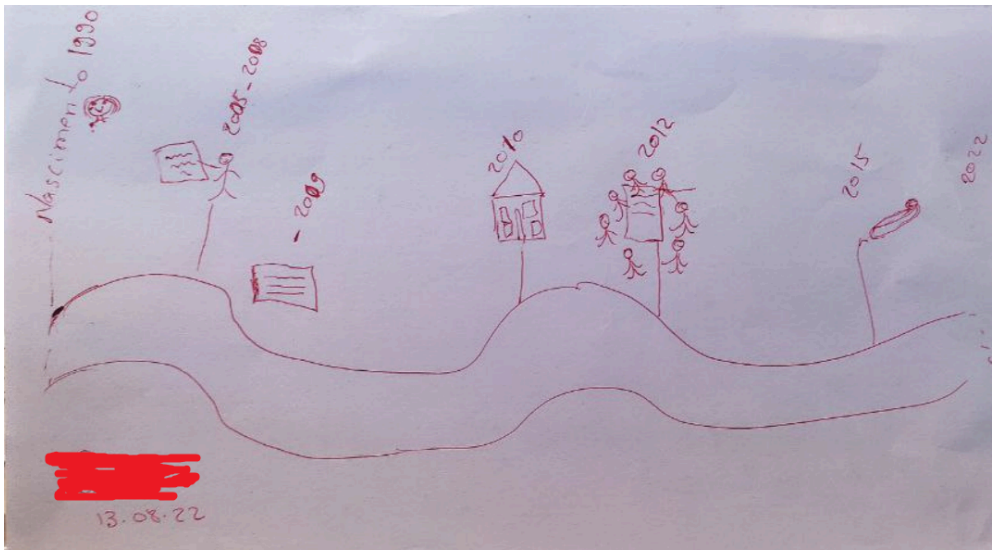
6. Reflection on the Journey: What insights have they gained about their personal and professional growth through this exercise?
7. Final Thoughts and Next Steps: Conclude with any additional thoughts and explain the next steps in the research.

Post-Interview

- Debriefing and Feedback: Offer a moment for any immediate post-interview reactions or feedback.
- Documentation: Take notes of the River of Life drawing and any non-verbal cues or additional observations.

Appendix E Interview 1: Drawings "River of Life"[7]





[7] One was deliberately omitted because it had too many details that would make it easy to identify the participant

Appendix F Interview 2 Guide: The Details of Experience with "Community Mapping"

Preparation

- Welcome Back and Recap: Start with a brief recap of the first interview and the purpose of this second interview.
- Introduction to Community Mapping: Explain the "Community Mapping" exercise, emphasising its role in exploring their current environment and interactions related to educational technology.

Setting Up the Community Mapping Exercise

1. Materials Preparation: Provide a large sheet of paper and coloured pens or markers.
2. Instruction for Community Mapping: Instruct the participant to draw a map representing Eduardo Mondlane University, focusing on the Engineering Faculty or their department. They should include key locations, people, resources, and any other elements that influence their use of educational technology for blended learning.

Conducting the Community Mapping Exercise

3. Drawing the Map: Give them sufficient time to create their map, encouraging details about resources, relationships, and influences on their educational technology use.
4. Discussion of the Map: Once completed, ask the participant to walk you through their map. Encourage them to explain the significance of each element, especially how these elements interact and influence their adoption and use of educational technology.

Main Interview Questions (Aligned with Community Mapping)

1. Role in the Community: How do they see their role within the university/department as a blended learning champion?
2. Influential Resources: What resources (like specific technologies, training

programs, policies) have been most influential in their adoption of educational technology?

3. Interaction with Peers and Students: How do their relationships with colleagues and students affect their use of educational technology?
4. Challenges within the Community: What obstacles within the university/department context have they faced in implementing blended learning?

Exploring UTAUT2 Variables Through Community Mapping

5. Performance Expectancy, *Effort Expectancy*, Social Influence, *Facilitating Conditions*: Discuss these UTAUT2 constructs in relation to the community map, exploring how the university environment affects their technology adoption.

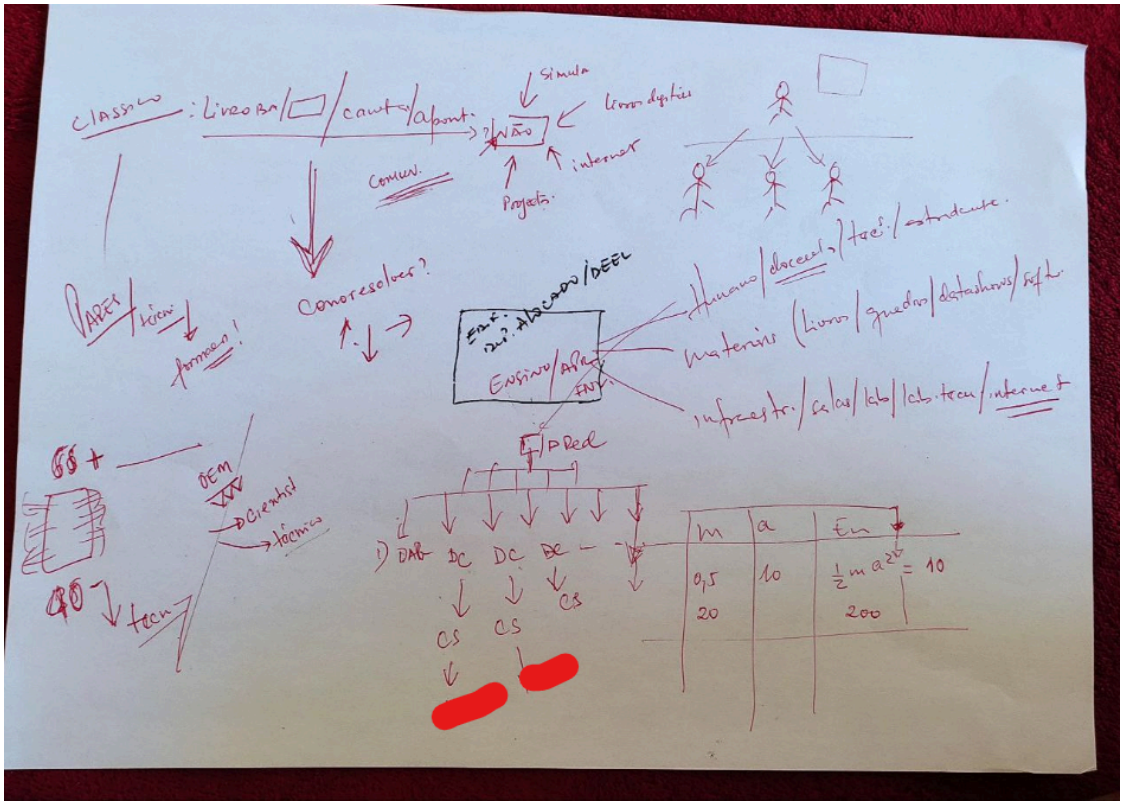
Reflective and Closing Questions

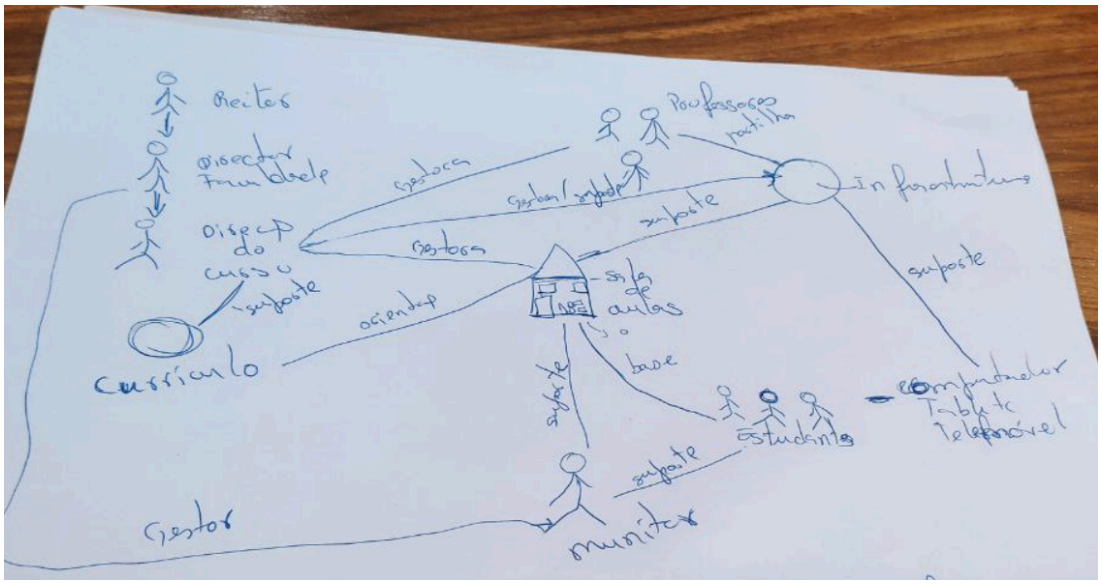
6. Reflection on Current Experience: How does this mapping exercise help them reflect on their current experience with educational technology?
7. Looking Ahead: What changes or developments would they like to see in the university's educational technology landscape?
8. Final Thoughts and Next Steps: Conclude with any additional thoughts and explain the next steps in the research.

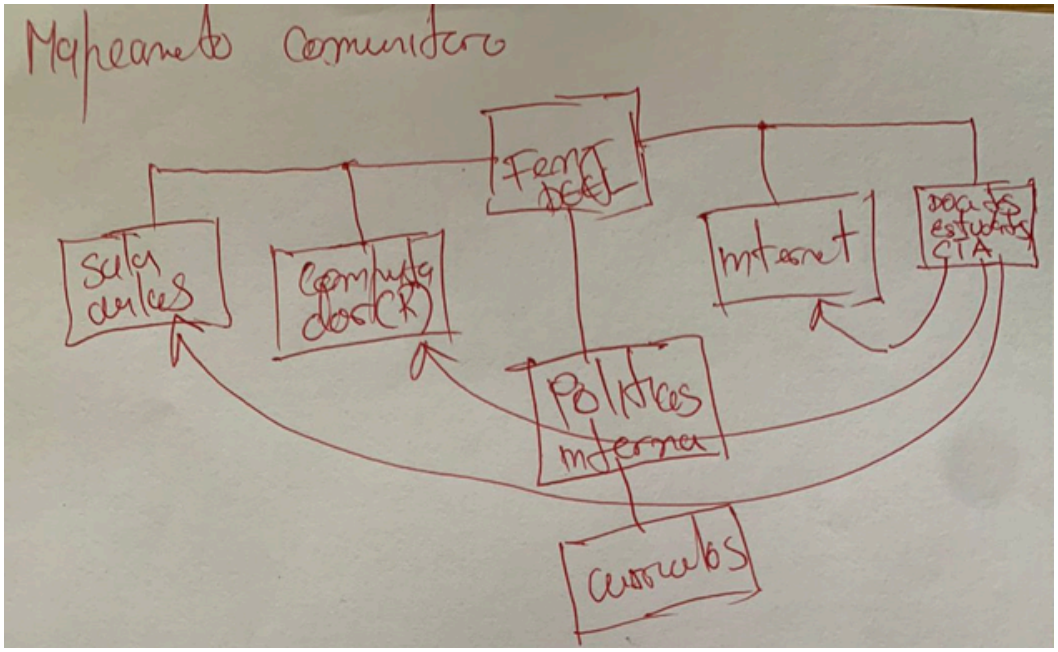
Post-Interview

- Debriefing and Feedback: Offer a moment for any immediate post-interview reactions or feedback.
- Documentation: Take detailed notes of the community map and any non-verbal cues or observations.

Appendix G Interview 2: Drawings "Community Mapping"



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Appendix H Interview 3 Guide: Reflection on the Meaning – Focus Group[8]

Preparation

- Welcome and Overview: Greet all participants and provide a brief overview of the purpose of this focus group, emphasising its role in reflecting on and discussing the findings from previous interviews.
- Ground Rules: Establish ground rules for the focus group discussion, such as one person speaking at a time, respecting others' opinions, and maintaining confidentiality.

Recap of Previous Interviews

- Summary of Findings: Present a summarised version of the findings from the first two interviews, highlighting key themes and patterns that emerged.
- Initial Reactions: Allow participants to share their initial reactions to these summarised findings.

Focus Group Discussion Topics

1. Shared Experiences: Encourage participants to discuss their shared experiences with educational technology and blended learning at Eduardo Mondlane University.
2. Comparative Perspectives: Facilitate a conversation where participants compare their experiences and viewpoints, especially in relation to the adoption and use of educational technology.
3. Challenges and Successes: Discuss common challenges and successes that emerged from the group, exploring how these experiences resonate with each participant.

Exploring Collective Insights

4. Shared Beliefs and Attitudes: Prompt discussion around shared beliefs and attitudes towards educational technology, as reflected in the earlier interviews.

[8] Due to scheduling conflicts among participants, the focus groups was conducted via zoom meeting

5. Impact on University Culture: Explore how their experiences and attitudes might be influencing the broader culture of technology use within the university.
6. Suggestions for Improvement: Ask the group for their suggestions on how to enhance the adoption and effective use of educational technology at the university.

Reflective and Closing Questions

1. Reflection on the Group Discussion: What are their thoughts on the insights shared during the focus group? Were there any surprises or new perspectives gained?
2. Final Thoughts: Offer a final opportunity for any additional thoughts or comments.
3. Thank You and Next Steps: Conclude by thanking everyone for their participation and explain how their contributions will be used in the study and the next steps.

Post-Focus Group

- Debriefing and Feedback: Allow time for any immediate post-discussion reactions or feedback from the participants.
- Documentation: Make detailed notes of the discussion, noting any consensus or divergent views, and any non-verbal cues or dynamics observed.

Appendix I Examples of literature review summary

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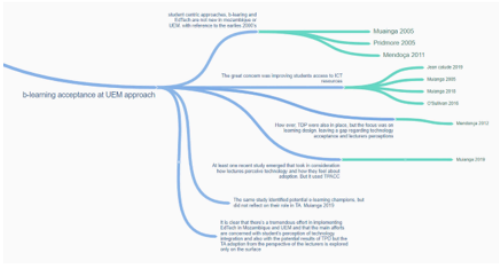

#	Author	Title	Year	Purpose	Theory	Methodology	Findings
6	Alaira Manuel, Domingos Buque, Rosário Quiuie	Students' Perceptions on Distance Education: A Case Study in Mozambique	2021	Explore the perceptions of youth and adult students in DAE at Eduardo Mondlane University (EMU)	Not clear	Qualitative Semi structured interviews Higher Education	*Students perceive DE as an opportunity *They associate it if flexibility Internet problems *Perceived slowness of response from the lecturers *Respondents have a positive attitude towards ICT
	Comments						
	*Although the study is about student's perceptions it also highlights the importance of the lecturer's online presence and digital skills; *Its seems farfetched to work with a group of students in a particular course of one university and then stretch the conclusions to characterize the whole country; *the author vaguely refer to internal and external challenges referring to outside or inside of the university's context					
7	Sérgio Paulo Cossa, Lurdes Patrocínia [illegible] and Nilsa Adelaide Issufo Enoque [illegible]	Open and Innovative Schooling: An Implementation Experience in Fifteen Secondary Schools across Mozambique	2021	report on an experiment with Open Educational Resources (OER) in 50 secondary schools		Mixed Secondary schooling focus on students Survey (quantitative for all stakeholders, from students, tutors to managers) Focus group with Centre managers	*focus on hardware access (mobile devices) *They suggest that the ministry of education supplies students with devices

	* it tells more about the game experiment then about Mozambican context						
10	Mulanga, [illegible] Inocente	Teachers' Perspectives on Professional Development in the Use of SCL Approaches and ICT: A Quantitative Case Study of Eduardo Mondlane University, Mozambique	2019	Understand the impact that ICT teacher training has on professional development Evaluate the impact of TDP	TPACK	Qualitative	*respondents that had prior contact with LMS had better attitude towards use (Table 7) *teachers who participate in TDP improve prosily their belief in the contribution ICT to their teaching efforts (Performance expectancy in UTAUT2)
	Comments *the study mentions the student centered approach has been at UEM's agenda since early 2000's *TPACK has a subcomponent that can be related to UTAUT2. The TPK relates to Performance Expectancy and maybe Effort Expectancy *The study confirms that there are teachers that use EdTech intensively and are committed to change without even having participated on the TPD (e-learning champions?)						
11	Jean Claude, [illegible] Hansson, [illegible]	An Exploratory Study on the Practices of IT-Institutional Alignment for Effective ICT Integration in University Services	2019	explores and identifies the dimensions and practices of IT-institutional alignment from a higher education context. Rwanda and Mozambique	t	m	*
12	Mulanga, Xavier; [illegible] Tina;	From Teacher Oriented to Student Centered Learning, Developing an ICT	2018	explored--using action research strategy--to what extent the new	t	Action [illegible] Interviews	*Student felt that the use of LMS improved their overall competence around ICTs *The self-paced task increased students intrinsic motivation

	[illegible] Inocente	Supported Learning Approach at the Eduardo Mondlane University, Mozambique		pedagogical approach contributed to students' competency development.		Blog entries	
	Comments *focus on first years students at Faculty of Education. Perception on their use of LMS *The study does not provide any context on the course design neither lecturers role						
13	O'Sullivan, Linda; Seabra, N. Miguel	School in a Box in Low Resource Primary School in Mozambique: Practical Application of Zone of Proximal Development in Teacher Training with Mobile Technology	2016	Report on an experiment with mobile educational technology for primary school		Qualitative Vygotsky's ZPD	
14	Laine, Teemu H.; Nygren, Eeva	Active and Passive Technology Integration: A Novel Approach for Managing Technology's Influence on Learning Experiences in Context-Aware Learning Spaces	2016	Not clear: explore how active or passive technology integration impacts learning experience.		Quantitative South Africa, Finland and Mozambique	