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DBS Applied Research and Theory Journal

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Applied Research and Theory Journal

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Journal Team

Editor-in-Chief

Dr Rita Day, EdD, MEd, MBA, BA (Hons) SFHEA, Rehab Ireland

Rita served as the Academic Director of Business, Law, and Marketing at Dublin Business School since December 2019 and Editor-in-Chief of the DBS Applied Research and Theory Journal from 2023 to 2024. Rita has been working in academia for the last 20 years. Before working at DBS, Rita worked at St. Mary's University College (a College of Queen's University, Belfast) and at Southampton Solent University. She holds a Master of Education (MEd) and a Master of Business Administration (MBA) from Ulster University and has Doctorate in Education (EdD) from the University of Winchester. Rita is a Senior Fellow of Advance HE and has become the Director of Learning at Rehab Ireland.

Editor-in-Chief

Dr Vincent Hunt BA(Hons), MBA, DBA.

Vincent has been a Senior Lecturer in Business since September 2024, having joined DBS as a lecturer in January 2023. Since February 2024 he has also served as Editor-in-chief of the DBS Applied Research and Theory Journal. With extensive industry experience across various organisations, Vincent brings valuable insights to his teaching and research. He has spent the last decade in academia, previously working at TU Dublin (Graduate Business School), SETU, and National College of Ireland. He holds an MBA from DCU and a DBA in Business Economics from UCC.

Managing Editor

Trevor Haugh MLIS BA, Dublin Business School

Trevor has worked in the DBS Library for fifteen years. He has worked in various roles both inside and outside the library during his time in DBS. In the Library he has worked as Head of Reader Services, Information Skills Manager and Deputy Librarian. Outside the Library Trevor has taken up other roles including part time Lecturer on the Msc in Information and Library Management and Dissertation Supervisor. Alongside his current role as Head of DBS Library, Trevor has been Joint Managing Editor of DBS Applied Research and Theory journal for the last 2 years.

Managing Editor

Louise Cooke-Escapil MLIS BA (Hons), Dublin Business School

Louise has been working in a variety of libraries for over 10 years. In 2023, she completed her Master's in Library and Information Science in UCD with a first class honours. Louise is an active member of the library community, being a member of the Library Association of Ireland and the Chartered Institute of Library and Information Professionals. She received the CILIP 125 award, which recognises librarians which have contributed to the sector. Louise currently works as the Research Librarian. As part of this role, she sits on the college's Research Committee and is a Joint Managing Editor for the Applied Research and Theory Journal.

Managing Editor

David Rinehart MA MSc, Dublin Business School

David studied a M.A. in Latin American Studies at the University of Florida where he started his first library job in the Smather's Latin American and Caribbean Collection. Since then, he has held several posts in various libraries in higher education including Dundalk Institute of Technology, Maynooth University, and DBS. He received a MSc in Library and Information Studies from Robert Gordon University. David is also cofounder of the Queer Library Alliance established to help provide guidance and support for all library professionals and library users threatened by the far right attacks on the LGBTQ+ community in Ireland. David is a Joint Managing Editor of the DBS Applied Research and Theory journal.

Senior Editor

Amy Fitzpatrick MSc BA, Mason Hayes and Curran

Amy completed her MSc in Information and Library Management in 2020 and has worked in a number of academic and professional libraries since. She started as a Library Assistant in DBS before stepping into the then-new role of Digital Literacy Librarian, in which she supported student and faculty through information skills training. In her time at DBS, Amy spoke at several conferences on the value of library publishing including the New Librarianship Symposium on Post-Neutrality Librarianship, hosted by the University of South Carolina in 2021. She now works as a Senior Library Assistant in Manson Hayes and Curran. Amy was a member of of the editorial team for DBS' previous journal, the DBS Business Review, and served as a Senior Editor for the Applied Research and Theory Journal; Volumes 1 and 2.

Senior Editor

Francisca Silva MLIS BA, Dublin Business School

Francisca has had a diverse professional experience in libraries, as well as public-facing and administrative roles, while completing a Masters in Political Science and International Relations in Portugal. Deciding to officially pursue a career in libraries, Francisca moved to Ireland in 2022 and graduated from MSc Information and Library Management at DBS with a first class honours the following year. She has since then worked for TU Dublin and been involved in different projects, having been awarded third place in the LIR Show and Tell 2023 competition. Francisca joined DBS in September 2023 as a Library Assistant, and is now the eResources Librarian and a Senior Editor for the Applied Research and Theory Journal.

Senior Editor

Niamh McHenry MLIS BA, Dublin Business School

Niamh has worked in the DBS Library since February 2023. Starting as a library assistant, Niamh studied a Master's in Library and Information Science at University College Dublin and graduated with First Class Honours. Upon completing her studies, Niamh was promoted to Outreach Librarian where she managed the library's social media presence on Instagram, promoting library services and resources, and promoting the library at in-person events. Her work as the Outreach Librarian earned her a nomination for the 2024 Kaplan Way Awards. In 2025, Niamh started as the library's Digital Literacy Librarian, supporting students through workshops and consultations and acting as a Senior Editor for the DBS Applied Research and Theory Journal.

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Editorial

Dr Rita Day
Former Editor-in-Chief
DBS Applied Research and Theory Journal
Dublin, Ireland

Welcome to Volume 2 of the Dublin Business School Applied Research and Theory Journal.

In this landmark year, marking the 50th anniversary of Dublin Business School (DBS), we are pleased to present Volume 2 of the DBS Applied Research and Theory Journal. Building on the foundations established in Volume 1, this rebranded journal continues to reflect DBS's broader commitment to applied research, fostering an intellectual environment that remains responsive to the evolving landscape of academic enquiry.

The primary aim of this journal is to facilitate the publication of high-quality applied research that offers practical insights or implications. This is reinforced through a rigorous double-blind peer-review process, alongside comprehensive support for copyediting and formatting. By welcoming contributions across a range of disciplines, the journal aspires to bridge the gap between theory and practice, making research accessible and applicable to a wide audience. As a diamond open-access publication, we ensure that all articles are freely accessible, reinforcing the ethos of DBS Library's commitment to open knowledge.

The Theme of 'Stay Curious'

This volume introduces the theme of "Stay Curious", an invitation to both our readers and contributors to explore the emerging frontiers of research in 2025 and beyond. With nine compelling articles, this volume encourages intellectual curiosity, urging an exploration of diverse disciplines through the lens of research and practice.

Under the leadership of our dedicated editorial team, this journal has taken on new vigour, driven by the expertise and vision of Trevor Haugh (Head of Library and Academic Hub, Joint Managing Editor), Louise Cooke-Escapil (Research Librarian and Joint Managing Editor), Amy Fitzpatrick (Senior Editor), David Rinehart (Information Skills and Research Manager, Joint Managing Editor), Francisca Silva (eResources Librarian and Senior Editor), and Niamh McHenry (Digital Literacy Librarian and Senior Editor). Together, they ensure the journal's continued commitment to the highest standards of scholarly excellence and with thanks to our wider editorial board.

Scope and Contributions

The DBS Applied Research and Theory Journal is structured around three key areas: research articles, review articles, and practice reports. In this volume, we feature contributions from a broad spectrum of voices, including students, faculty and practitioners, and from national and international backgrounds. These diverse perspectives offer a wide range of insights into the application of theory in real-world contexts. As a diamond open-access journal, we are proud to provide a sustainable business model that enhances the accessibility of the journal. Our commitment to open access publishing is deeply embedded in the ethos of DBS Library, ensuring that our research is freely available to a global audience. The journal is indexed in on EBSCO, ensuring its visibility and accessibility to scholars and practitioners worldwide.

Key Research Themes in This Volume

The research articles in this volume span multiple disciplines, yet a common thread runs through them: the theme of well-being and the challenge of navigating an uncertain future. Notable among the contributions is Quaglio's research on the role of coping self-efficacy, social support, and loneliness in acculturative stress among Brazilians in Ireland. This collaborative study, co-authored by Manley and Hyland of the DBS Psychology Department, underscores the significance of social support for immigrant communities in managing stress and enhancing life satisfaction. Similarly, Brady et al. critically examine the post-pandemic effects of remote working on affective well-being, work-life balance, and job satisfaction, offering valuable insights into the evolving dynamics of the modern workplace. Elsewhere, Hamill delves into the role of trust in knowledge sharing within project-based organisations, while Israni addresses work-related stress through the lens of mindfulness practices in organisational settings.

The theme of digital transformation is explored in Kumar et al.'s research on digital supply chain management and its impact on the sustainability of construction projects. Meanwhile, Loison and Balou offer a forward-looking analysis of digital banking in Canada, focusing on the behaviours, preferences, and marketing implications for the Gen Z demographic. Other articles such as Munalula and Mpundu's investigation of digital empowerment in agriculture, reflect the journal's diverse focus on the intersection of practice, industry, and research.

Practical Applications in Research

The applied nature of this journal is particularly evident in articles like Tully's practical guidance on using sustainable marketing as a force for good. In the realm of education, Garcia-Beltran et al. introduce an innovative approach to teacher training in secondary education which shows the pedagogical journey for academics to deliver real-world teaching.

Also of note is O'Connell's article on the rewilding of a farm in Sligo, a timely exploration of sustainability in the context of environmental stewardship. In addition, Munalula and Mpundu highlight the challenges faced by smallholder farmers in Chongwe District, Zambia, in their evaluation of digital infrastructure and services.

Expanding Our Reach and Impact

The journal continues to evolve, with an increasing number of contributors and collaborations. DBS hosts the annual Practical and Applied Research Conference (PARC) each April providing an opportunity for interdisciplinary submissions to be considered for publication. In November 2024, the Higher Education Colleges Association (HECA) Research Conference further expanded our research network and collaborations.

In recognition of excellence, we have introduced a Postgraduate Student Award, aimed at encouraging the next generation of scholars to contribute to the journal. As we look ahead, we plan to expand the journal's research through data analytics, forge new national and international partnerships, and cultivate a wide array of submission types beyond traditional research paradigms.

Looking Ahead

The DBS Applied Research and Theory Journal is set to grow in both scope and impact. The journal will continue to transcend disciplinary boundaries and foster vibrant academic discourse. The "Stay Curious" theme reflects our commitment to pushing the boundaries of research and its practical applications, shaping the future of research in both academia and beyond.

We hope you enjoy reading this volume as much as we have enjoyed curating it.

Sincerely,

The Editorial Team

DBS Applied Research and Theory Journal

DBS Applied Research and Theory Journal

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Gen Zs and the Future of Digital Banking: Behaviours, Preferences, and Marketing Implications for Digital Banking in Canada.

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Abstract

Like most businesses, banking has moved towards cashless payments. While this presented a challenge to some older customers, Generation Z have been brought up in a digital-first environment. This research examines the unique digital banking behaviours and preferences of Generation Z in Canada, focusing on individuals born between 1997 and 2001.

This article assesses how well digital banking services align with Generation Z's expectations and outlines critical areas for improvement. A striking finding from this study, includes the heightened influence of family members on Generation Z's trust of choosing a digital banking provider. The data suggests family influence is markedly higher than the influence of social media on Generation Z, which has a much higher influence for other forms of consumption. A sample of 316 respondents was used via an online survey of Generation Z individuals aged 23 to 27 (as of 2023) within Canada's three major regions: Central Canada, the Prairies, and the West Coast. Recommendations emphasize enhancing mobile platforms, maintaining security trust, offering culturally responsive features, and leveraging personal recommendations. The research underscores the need for financial institutions to refine their strategies continuously to meet the evolving demands of this digitally adept generation, which is at the forefront of transforming digital finance.

Introduction

The digital banking landscape has evolved over the past decade, shaped by advancements in technology and shifting consumer demographics. Among these consumers, Generation Z (Gen Z) represents a pivotal group whose banking behaviours and preferences are influenced by their upbringing in a digital-first environment. This demographic, born between the mid-1990s and early 2010s, has grown up amidst rapid technological changes, including the proliferation of internet services, smartphones, and social media. Their interaction with technology is intuitive, setting them apart from previous generations in terms of how they access and use banking services.

In Canada, Gen Z comprises a significant portion of the population, characterized by their diverse backgrounds and a high level of tech-savviness. This study seeks to understand how digital banking has adapted to meet the needs of this unique cohort, focusing on their preferences for mobile banking, expectations of personalization, responsiveness to marketing strategies, and the influence of ethical considerations on their banking choices. Research indicates that Gen Z values efficiency, security, and ethical practices in their banking interactions, preferences that demand a shift from traditional banking methods to more dynamic, digital-first approaches.

Canada's financial sector has been at the forefront of embracing digital transformation, influenced by regulatory environments that support innovation and a societal inclination towards embracing new technologies. The rapid evolution of digital banking in Canada reflects broader global trends, yet it is uniquely influenced by the country's significantly diverse demographic makeup and progressive technological adoption. This diversity necessitates a banking approach that is flexible, inclusive, and responsive to a range of cultural expectations and financial behaviours. Generation Z, in this mix, stands out as a particularly influential group due to their size and distinctive preferences shaped by digital immersion from a young age.

This background establishes the foundation for exploring the complex interplay between Gen Z's characteristics and their digital banking behaviours. By examining a sample of 316 participants, in collaboration with Centiment, this study aims to provide insights that will help Canadian financial institutions better cater to this emerging demographic, ensuring their services align with the expectations and behaviours of Gen Z consumers.

The research objectives of this article are:

1. **To identify and analyze the digital banking behaviours and preferences of Generation Z in Canada**

2. **To assess the influence of marketing strategies on Generation Z's banking decisions**

3. **To understand the impact of social and ethical factors on Generation Z's banking choices**

4. **To provide actionable insights for the banking industry on engaging with Generation Z**

Each of these objectives contributes to building a robust framework that will help Canadian financial institutions better understand and serve Generation Z, a demographic that is set to become increasingly dominant in the consumer market.

Literature Review

Gen Z's Generational Characteristics and the Canadian Context

Generation Z (Gen Z), typically identified as those born from the mid-1990s to the early 2010s, marks a unique cohort shaped by momentous societal and technological shifts. Various sources suggest starting between 1995 and 1996 (Dolot, 2018; Fromm and Read, 2018; Witt and Baird, 2018). However, there's a consensus on the end year being around 2012, as noted in "Zconomy" by Dorsey and Villa, as well as sources like The Center for Generational Kinetics (CGK) and the Pew Research Center. These birth years are significant, enveloping critical events like the digital revolution, globalization, and the 2008 financial crisis, which have profoundly influenced Gen Z’s perspectives and interactions, particularly in the digital banking sector (The Center for Generational Kinetics, 2016; Pew Research Center, 2020).

This research focuses on Generation Z due to their unique characteristics and growing influence in various domains. This generation is characterized by their digital nativity, with a strong reliance on digital platforms for social interactions and community engagement, as described in "Zconomy" by Dorsey and Villa (2020) and "Marketing to Gen Z" by Fromm and Read (2018). They exhibit a hyper-cognitive nature, continually acquiring skills to navigate the digital world (Hernandez-de-Menendez, Escobar Díaz and Morales-Menendez, 2020). Their perspectives on gender and sexual identities are fluid and expansive, challenging traditional binaries (Hammack et al., 2022). De Witte (2022) and D’Arco et al. (2023) highlight Gen Z’s pragmatic approach to global challenges like climate change and their strong pro-environmental behaviour.

Diverse travel experiences and engagement with different cultures further emphasize Gen Z's global consciousness (Robinson and Schanzel, 2019). Johns Hopkins University underscores Gen Z’s quest for truth and exploration, shaping their values and societal norms. In terms of entrepreneurship and employment, Gen Z shows a marked preference for job security and value-aligned organizations, showcasing their entrepreneurial spirit and risk-averse nature in the workforce (Lev, 2021).

In Canada, Generation Z forms a notable segment of the population, representing 18.2%, as detailed in Statistics Canada's 2021 Census report. This group is overshadowed only by Millennials and Baby Boomers in terms of size. The demographic distribution of Gen Z varies significantly across regions; for example, they constitute 19.7% in Alberta, 16.1% in Newfoundland and Labrador, and a striking 28.7% in Nunavut. These figures illustrate not just the substantial presence of Gen Z in Canada’s demographic landscape but also the diverse geographic distribution across provinces and territories.

Gen Z in Canada, individuals aged 9 to 24 as of 2021, is marked by higher levels of education and diversity compared to preceding generations (Statistics Canada, 2022). This diversity encompasses a broad spectrum of ethnicities, religious beliefs, and gender identities, reflecting their upbringing in a globally connected, technologically advanced environment (Statistics Canada, 2022). This cohort, along with Millennials, is gradually becoming a substantial part of the working-age population, influencing changes in the Canadian labour market (Statistics Canada, 2022). Projections by the Government of Canada suggest that by 2032, GenZ could outnumber Baby Boomers and, by 2045, surpass Millennials, indicating a significant demographic shift driven by the aging of Baby Boomers and sustained immigration (Statistics Canada, 2022). Despite a notable decline in population growth during the 2020/2021 period due to the COVID-19 pandemic, Millennials and Gen Zs are expected to constitute a major portion of the working-age population by 2031, with Millennials accounting for 34.6% and Gen Z for 31.5% (Statistics Canada, 2022).

Digital Banking

Digital banking, defined by Haralayya B. (2021) as the computerization of traditional banking services, has significantly evolved, transforming how financial services are delivered and experienced. This evolution represents a shift from the need for physical banking locations to online platforms, enabling users to access banking services remotely. However, digital-only banks have often featured interchangeably in the literature on digital banking, which has presented some challenges in distinguishing them from a digital service provided by traditional banks (Windasari et al. 2022).

In recent years, the landscape of digital banking has undergone a significant transformation, deeply influenced by technological advancements. The shift towards digital banking can be traced back to early forms of electronic banking, like ATMs and cards, in the 1960s, but it gained considerable momentum in the past decade (Osei, Cherkasova and Oware, 2023). Since 2014, there has been a substantial increase in scholarly attention to Digital Banking Transformation (DBT), with a notable quantum leap in research publications (Osei, Cherkasova and Oware, 2023). This period marked the introduction of disruptive technologies such as FinTech, blockchain, and artificial intelligence into the banking sector, fundamentally altering traditional banking models and practices. The rapid adoption of digital banking over conventional methods has been a key feature of this evolution, driven by the need to enhance customer experience and operational efficiency (Osei, Cherkasova and Oware, 2023).

The digital transformation in banking has impacted business processes and revolutionized the relationship between financial institutions and their customers. Digital platforms have enabled financial institutions to provide a variety of services simultaneously, catering to a diverse customer base while improving operational efficiency. The integration of mobile technologies and social media has played a crucial role in digitizing bank value chains and addressing and influencing customer demands and expectations. This period also witnessed a significant shift in the banking industry, moving towards more customer-centric and digitally enabled business models. Banks of all sizes have invested heavily in digital initiatives to maintain competitiveness and meet customer needs more effectively, leading to greater customization and a more intimate customer experience efficiency (Osei, Cherkasova and Oware, 2023).

In recent years, the banking sector has experienced a significant integration with FinTech and technology organizations, leading to joint ventures, mergers, and acquisitions. This integration has been a driving force in the evolution of digital banking, paving the way for a more digitally transformed financial environment (Broby, D., 2021). Notable milestones include the emergence of online banks like ING Direct in the 1990s and major tech companies' introduction of e-commerce and social network-based banking services (Osei, Cherkasova and Oware, 2023). The advent of mobile banking apps, direct deposit to Peer-to-Peer (P2P) payments, and cloud-based banking platforms with AI integration have become commonplace, reflecting the industry's rapid adaptation to digital trends. This phase of evolution underscores a significant shift from traditional branch-based banking models to a digitally dominated landscape, highlighting the growing importance of digital technologies in shaping the future of banking efficiency (Osei, Cherkasova and Oware, 2023).

Factors Influencing Consumer Behaviour in Digital Banking

Technological Attributes and Consumer Behaviour in Digital Banking

The technological attributes of digital banking platforms, including usability, functionality, and integration, play a critical role in shaping consumer behaviour. Usability, defined by Nielsen (1993) as the ease of learning, utilizing, and remembering a system, directly influences customer satisfaction and the likelihood of repeated use. As Broby (2021) points out, functionality is pivotal in consumer engagement within the financial sector, with advancements like mobile banking and robotics revolutionizing service delivery. King (2019), in his book "Bank 4.0: Banking Everywhere, never at a Bank", emphasizes the integration of technology in banking, advocating for an always-on, frictionless banking environment that meets modern consumer expectations for instant and ubiquitous services.

Trust and Security Perceptions in Digital Banking

In the realm of digital banking, trust and security are of utmost importance. Studies like the "US Banking Digital Trust Benchmark 2022" by Elm (2022) and a 2021 PYMNTS study underline the importance of trust, which encompasses reliability, security, and ethical standards. Consumers' perceived risks now include concerns about data security and identity theft, affecting their engagement with digital platforms. Financial institutions communicating their commitment to security effectively can alleviate these concerns, fostering trust and encouraging the adoption of digital banking (Elm, 2022; PYMNTS, 2021).

Influence of Social Media on Digital Banking

Social media platforms significantly influence consumer behaviour in the digital banking sector. Kotler et al. (2010), in their book “Marketing 3.0: From Products to Customers to the Human Spirit,” discuss the impact of expressive social media (like Facebook, Twitter, and YouTube), shaping consumer perceptions and preferences. Another platform, TikTok, has emerged as a critical source of information for Generation Z. Statista's 2022 report indicates that 40% of the world's Gen Z population utilizes TikTok for information, primarily because its content is entertaining, educational and creator-driven (Geyser, 2023). This generation places a high value on authenticity and relatability (Francis and Hoefel, 2018). Consequently, these platforms have catalyzed a shift in marketing strategies, fostering more authentic and engaging consumer interactions (Kotler et al., 2010; Francis and Hoefel, 2018). However, it's important to note that all social media platforms can be unreliable sources of information due to the spread of misinformation and lack of rigorous content verification (Pennycook and Rand, 2020).

Cultural and Economic Factors Influencing Digital Banking

Cultural and economic factors are integral in shaping consumer behaviour in digital banking. Solomon et al. (2023) emphasize the role of culture in consumer choices, with enculturation and acculturation affecting consumption patterns. As highlighted by Francis and Hoefel (2018) and Toit et al. (2023), economic factors include fees, interest rates, and the appeal of digital-native banks, influencing consumer preferences toward cost-effective and personalized banking solutions.

The Role of Personality, Lifestyle, and Values

Solomon et al. (2023) explore how personality, lifestyle, and values impact consumer behaviour. Personality traits influence decision-making processes, lifestyles determine preferences for specific banking features, and values affect attitudes toward services like digital banking. Understanding these factors is crucial for digital banking platforms to align their services with the needs and expectations of their users, particularly in catering to the unique preferences of digital-native generations like Gen Z.

In summary, the evolution of consumer behaviour in digital banking is influenced by a complex interplay of technological attributes, trust and security perceptions, social media influence, cultural and economic factors, and individual personality traits, lifestyles, and values. These aspects collectively shape how consumers perceive, interact with, and adopt digital banking services, highlighting the need for a nuanced understanding of these diverse influences in the rapidly evolving digital banking landscape.

Behavioural Economics and its Implications in Digital Banking

Behavioural economics, a subfield that intersects economics and psychology, critically examines the classical economic assumption of rational agents in markets (Kahneman, 2011). Unlike traditional economics, which assumes that individuals always make decisions to maximize their utility, behavioural economics highlights how humans are subject to cognitive biases, possess limited self-control, and are influenced by social and emotional factors, leading to decisions that often deviate from strict rationality (Kahneman, 2011).

In “Thinking, Fast and Slow,” published in 2011, Daniel Kahneman elaborates on these concepts, introducing a detailed analysis of the dual-process theory of human thought, which affects decision-making processes. This perspective is particularly relevant when analyzing the financial behaviours of Generation Z, who predominantly interact with financial institutions via digital banking platforms. Drawing from Thaler and Sunstein's nudge theory (2008), digital banking can be strategically designed to guide Gen Z toward more prudent financial behaviours. By incorporating elements that promote savings, investment, and responsible spending, these platforms can 'nudge' Gen Z users towards better financial decisions while preserving their choice autonomy.

For digital banking in Canada, these behavioural insights have critical implications. Financial institutions can leverage this understanding to design digital interfaces and banking experiences that resonate with Gen Z's behavioural patterns. For instance, incorporating gamification elements can effectively nudge this cohort towards desirable financial behaviours, such as saving (Thaler and Benartzi, 2004). Simplifying the presentation of financial options caters to their desire for ease of use and clarity, mitigating the paradox of choice (Schwartz, 2004) that can overwhelm users with too many options. Moreover, showcasing community savings goals and successes could capitalize on Gen Z's inclination towards communal and social influences. By integrating these behavioural economics principles, Canadian financial institutions can attract Gen Z users and foster a more financially literate and responsible generation equipped to navigate the complexities of the modern economic landscape.

Gen Z's Adoption of Digital Banking

Canadian and International Perspectives

The ascent of digital banking has been significantly shaped by Generation Z's embrace of technological solutions for their financial needs. In Canada, this trend is manifested by a substantial increase in mobile app-based banking usage, rising from 56 percent in 2018 to 65 percent in 2021, with Gen Z and Millennials leading this digital charge (Canadian Bankers Association, 2022). The broader adoption of digital channels for banking transactions is notable, with 78 percent of Canadians managing their banking online, up from 68 percent in 2016. This shift is further affirmed by the 90 percent of consumers who recognize the enhanced convenience of new technologies, and 86 percent of Canadians believe their bank's services have improved due to technological advancements (Canadian Bankers Association, 2022).

Globally, the United States reflects a parallel trend, where a significant 95 percent of Gen Z individuals utilize mobile banking, highlighting a generational shift toward digital financial management (Statista, 2023). This proclivity for digital banking is catalyzed by integrating gamification and interactive, user-centric service design, resonating with Gen Z's affinity for engaging and seamlessly integrated digital experiences (Witt and Baird, 2018). Such innovations not only cater to the expectations of the younger demographic but also signal a universal transition in banking behaviours, indicative of potential growth in the digital financial services sector globally (Witt and Baird, 2018).

In summary, the digital banking landscape in Canada, as influenced by Generation Z, underscores a definitive trend toward mobile, app-based solutions. This generation's reliance on digital banking, with nearly half of Gen Z (46 percent) preferring apps for their banking needs, reflects comfort with technology that is reshaping the financial sector (Canadian Bankers Association, 2022). As the industry evolves to meet these digital expectations, mobile transactions are anticipated to become increasingly prevalent, with current satisfaction levels at 80 percent and expected to rise (Canadian Bankers Association, 2021). The Canadian experience, therefore, is emblematic of an international movement, with Gen Z at the helm of a future where digital banking is the norm.

Marketing Strategies for Digital Banking Targeted at Gen Z

Integrating Effective Communication

Gen Z, a digitally native and trendsetting demographic, requires innovative, direct, and digital-first communication strategies (Dorsey and Villa, 2020). Brands must embrace platforms and media that resonate with Gen Z, such as social media, influencer marketing, and interactive digital experiences (Dorsey and Villa, 2020). Authenticity and transparency are essential, as this generation values genuine brand interactions over traditional advertising. Utilizing storytelling and content that reflects their values and interests is crucial for effective engagement (Dorsey and Villa, 2020).

Personalization

Personalization is paramount in attracting and retaining Gen Z customers. This generation expects services and marketing to be tailored to their individual preferences and needs (Dorsey and Villa, 2020; Fromm and Read, 2018). Digital banking platforms can leverage data analytics and AI to provide personalized financial advice, product recommendations, and customer service. Personalization also extends to user experience design, ensuring that banking apps and websites are intuitive, user-friendly, and customizable (Dorsey and Villa, 2020; Fromm and Read, 2018).

Customer Experience

Customer experience for Gen Z goes beyond mere transactions. It encompasses a seamless, engaging, and hassle-free journey across all digital touchpoints (Dorsey and Villa, 2020; Fromm and Read, 2018). This includes fast and efficient online services, 24/7 customer support, and a strong mobile presence (Fromm and Read, 2018). Ensuring data security and privacy is also vital, as Gen Z is highly aware of these aspects (Dorsey and Villa, 2020; Fromm and Read, 2018; Witt and Baird, 2018). Creating an omnichannel experience that smoothly transitions between online and offline channels can further enhance customer satisfaction (Dorsey and Villa, 2020; Fromm and Read, 2018; Witt and Baird, 2018).

Brand Loyalty

To foster brand loyalty among Gen Z, digital banks need to consistently deliver value and align with their social and environmental values (Fromm and Read, 2018). Loyalty programs that reward engagement and transactions can be effective, but they must be coupled with a more profound brand mission that resonates with this generation's desire for social change (Dorsey and Villa, 2020; Fromm and Read, 2018). Engaging Gen Z through community initiatives, sustainable practices, and corporate responsibility can strengthen loyalty (Dorsey and Villa, 2020; Fromm and Read, 2018).

Advocacy

Gen Z's influence in their networks can be harnessed to turn satisfied customers into brand advocates (Dorsey and Villa, 2020). Encouraging social sharing, creating referral programs, and engaging them in co-creating services or products can promote advocacy. User-generated content and positive online reviews can also amplify the brand's reach and credibility among Gen Z audiences (Dorsey and Villa, 2020; Witt and Baird, 2018).

Prospects of Digital Banking for Gen Z in Canada

Financial Behaviour of Gen Z in Canada

Generation Z in Canada has shown a notable shift towards prudent financial behaviour, influenced significantly by economic upheavals such as the 2008-09 financial crisis and the COVID-19 pandemic (Canadian Bankers Association, 2021). These events have fostered a strong ethos of savings and budgeting within this demographic. According to the Canadian Bankers Association (2021), Gen Z actively engages in budgeting, with 71 percent of them practicing some form of expense management. A significant portion (58 percent) uses formal methods like written records, spreadsheets, and digital tools to maintain their budgets. Despite facing barriers such as low income and unexpected expenses, 77 percent consistently allocate a portion of their income to savings, averaging around nine percent. This generation also demonstrates a cautious approach towards debt, with 73 percent carrying some form of debt and actively managing it yet experiencing anxiety over their financial obligations (Canadian Bankers Association, 2021). The robust trust Gen Z places in banks (80%) and their proactive seeking of financial advice (69 percent) highlight their commitment to financial stability and informed decision-making (Canadian Bankers Association, 2021; Valenti and Alderman, 2021).

The COVID-19 pandemic's disproportionate impact on Gen Z in Canada, especially those in the service sector, has disturbed their educational and career trajectories, alongside financial stability (Canadian Bankers Association, 2021). However, this demographic exhibits a resilient outlook toward their financial future, actively strategizing to enhance their financial resilience (Canadian Bankers Association, 2021). This resilience is manifest in their savings behaviour. The Canadian Banker's Association survey (2021) indicates that three-quarters of Gen Z participants possess a savings account, and a similar proportion (77 percent) consistently allocate a portion of their income to savings, averaging nine percent. Notably, this savings mindset persists even among those in precarious financial conditions (68 percent), underscoring a generational shift towards financial prudence. Gen Z's top saving priorities are emergency funds and financial independence, a response shaped by the pandemic's unpredictability and economic shock (Canadian Bankers Association, 2021).

Digital banking strategies in Canada must concentrate on features that facilitate resilience-building, such as adaptable financial solutions and tools for managing emergency funds. Additionally, in various articles, PwC Canada (2023) underscores the ongoing digital transformation in Canadian banks, highlighting the critical need to develop distinctive customer experiences and new efficiencies to meet the demands of Gen Z.

Technology and Innovation

Gen Z's proficiency with routine financial responsibilities has matured, pivoting towards a need for assistance with overarching financial objectives like investment and emergency fund accrual (Reich G., 2023). This generational transition accentuates the necessity for digital banking platforms to offer extensive financial planning tools and tailored educational resources. Additionally, Gen Z's preference for tech-centric solutions, including mobile banking apps and contactless payments, necessitates continual innovation in these domains (Canadian Bankers Association, 2022). Valenti and Alderman (2021) suggest that integrating human elements into digital banking can enhance Gen Z's satisfaction and loyalty, indicating that a blend of human and digital banking features is crucial for future banking strategies.

Inclusion and Accessibility

Gen Z in Canada represents a heterogeneous demographic with diverse financial experiences and challenges. Notably, members of Gen Z, including women, Black, and Hispanic individuals, often confront more pronounced financial difficulties compared to their White or male counterparts (Reich, 2023). Consequently, digital banking solutions must prioritize inclusivity and accessibility, catering to the varied financial needs of Gen Z's various segments globally (Reich, 2023).

Local and Global Connectivity

The growing preference for digital banking channels among Canadians, particularly Gen Z, signifies a shift towards more globally integrated financial services. Gen Z's affinity for online and mobile banking, coupled with their receptiveness to private cryptocurrencies, indicates the necessity for digital banking platforms that enable seamless international transactions and offer diverse currency options (Canadian Bankers Association, 2021).

Future Challenges and Opportunities

The swift evolution of banking technology presents both challenges and opportunities for the realm of digital banking in Canada. Financial institutions must persist in innovating and adapting to Gen Z's evolving preferences, ensuring services maintain flexibility, security, consistency, and accessibility. As consumer behaviours and expectations continue to transform, influenced by technological advancements and the pandemic, Canadian banks need to stay agile and responsive (Canadian Bankers Association, 2021). PwC Canada (2023) underscores the importance of banks continuing to embrace emerging technologies and new business models to maintain relevance and build trust in an increasingly digitalized world.

Synthesis of Literature and Research Implications

The extensive literature review on Generation Z's engagement with digital banking in Canada offers insights into this unique cohort's impact on the financial sector. Identified as individuals born from the mid-1990s to the early 2010s, Gen Z has experienced significant societal and technological shifts, including the digital revolution and the 2008 financial crisis. These events have profoundly influenced their attitudes and behaviours, especially in digital banking.

Gen Z's digital nativity is a defining characteristic. Accustomed to rapid technological progress, they expect comprehensive digital integration in their lives, including banking. Their comfort with digital platforms extends to social interactions and community engagement, emphasizing their reliance on technology for various facets of life.

Their hyper-cognitive nature and adaptable perspectives, particularly on gender and sexual identity, challenge traditional norms. These traits necessitate digital banking platforms that are not only technologically advanced but also socially and ethically conscious. In Canada, Gen Z represents a significant demographic segment characterized by high education levels and diversity. Their growing influence in the labour market suggests a corresponding impact on the digital banking sector.

Digital banking has evolved remarkably, shifting from traditional methods to a digitized model driven by FinTech, blockchain, and AI innovations. This evolution aligns with Gen Z's preference for mobile and app-based banking solutions, prioritizing efficiency and accessibility.

Marketing to Generation Z requires innovative and digital-first strategies. This generation values authenticity, transparency, and personalized experiences. They engage with brands that mirror their values and interests, emphasizing the importance of relatable content and storytelling. A seamless, engaging customer experience across digital platforms, coupled with stringent data security and privacy measures, is crucial for Gen Z.

In conclusion, the literature review highlights Gen Z's unique characteristics and their significant influence on the future of digital banking in Canada. Their digital nativity and expectations for efficient, socially responsible banking experiences are reshaping the sector. As they gain economic prominence, their preferences and behaviours will crucially shape the financial sector's trajectory, underlining the need for ongoing research and adaptation in digital banking.

Despite the extensive analysis, gaps and opportunities for further research remain in this dynamic field. One area is the exploration of Gen Z's long-term financial behaviours as they age and their economic power increases. Understanding how their early experiences and preferences evolve could offer valuable insights into future banking trends and consumer needs.

There is also a need for more nuanced research into the diverse segments within Gen Z, particularly how cultural, economic, and regional differences within Canada impact their digital banking preferences and behaviours. This could help in designing more inclusive and tailored banking solutions.

Another potential area of research is the impact of emerging technologies like cryptocurrencies and blockchain on Gen Z’s banking habits. As these technologies gain traction, it’s crucial to understand how Gen Z perceives and interacts with these innovations.

Further research could also delve into the psychological and behavioural aspects of Gen Z’s digital banking experience, exploring how trust, security perceptions, and user interface design influence their banking choices and satisfaction.

Lastly, with the rapid pace of technological advancements, continuous research is needed to keep abreast of new trends and tools in digital banking, ensuring that financial institutions can adapt and meet the evolving needs of Gen Z consumers. This includes the potential impact of AI and machine learning on personalizing banking experiences and enhancing customer service efficiency.

In conclusion, while the current literature provides a substantial foundation of knowledge, the dynamic nature of technology, economics, and generational behaviours presents ongoing opportunities for further exploration and understanding of Gen Z's relationship with digital banking.

Methodology

This research integrates a multi-dimensional approach to theoretical frameworks, addressing various facets of digital banking behaviour among Generation Z. The Extended Technology Acceptance Model (TAM), as elaborated by Davis (1989) and further developed by Venkatesh and Bala (2008), provides a foundational perspective on technological attributes influencing technology adoption, pertinent for exploring Gen Z's interactions with digital banking platforms (Davis, 1989; Venkatesh and Bala, 2008). Complementing this, the Unified Theory of Acceptance and Use of Technology (UTAUT), proposed by Venkatesh et al. (2003), offers an expanded view, incorporating social influence and facilitating conditions, vital in understanding the effects of social media and cultural factors (Venkatesh et al., 2003).

To address the crucial aspect of trust in digital banking, McKnight, Choudhury, and Kacmar's Trust in E-Commerce model (2002) is employed, focusing on factors like perceived website quality and company reputation, key in analyzing how design and functionality influence Gen Z's trust in digital banking platforms (McKnight, Choudhury, and Kacmar, 2002). Additionally, Gefen et al.'s framework on Trust and TAM in Online Shopping (2003) is integrated to understand the role of familiarity and social presence in the development of trust (Gefen, Karahanna and Straub, 2003).

Furthermore, applying the Nudge Theory, grounded in behavioural economics articulated by Thaler and Sunstein (2008), is vital for exploring strategic influences on Gen Z's financial behaviours through digital banking platforms (Thaler and Sunstein, 2008). The Consumer Decision-Making Model will also be used to comprehend the decision-making processes specific to Gen Z in the context of digital banking (Blackwell et al., 2006). Moreover, as discussed by Solomon et al. (2023), Cultural Theory facilitates an analysis of how cultural influences affect Gen Z's banking choices, aligning with Canada's multicultural landscape (Solomon et al., 2023).

Additionally, this research incorporates O'Toole *et al.* (2021) insights on the technological empowerment and behavioural shifts during the Covid-19 pandemic, online shopping behaviour insights by Dorsey and Villa (2020) and the ethical consumption and marketing framework relevant to Generation Z by Djafarova and Foots (2022).

These frameworks provide a comprehensive lens to analyze the complex interplay of technological, social, cultural, economic, and psychological factors, along with trust dynamics, in influencing digital banking adoption and usage among Generation Z. This integration of diverse perspectives aims to offer a nuanced understanding of the factors driving Gen Z's engagement with digital banking services in the Canadian context.

A quantitative approach is particularly suitable for this research due to its capability to systematically gather and statistically analyze data across a broad demographic. The focus on Canadian Gen Z individuals born within this five-year span is not only demographically significant but also practically driven, acknowledging the constraints of time and resources in conducting expansive research. By narrowing down the age range, the study can delve deeper into the unique digital banking behaviours and preferences of this specific cohort, offering more targeted and relevant insights.

Data Collection Methods

This study employs an online survey methodology, initially intended to be distributed via Google Forms to Generation Z individuals aged 23 to 27 (as of 2023) within Canada's three major regions: Central Canada, the Prairies, and the West Coast. These regions were selected for their demographic significance, representing the diverse cultural and population dynamics of Canada's urban centers. The aim was to conduct the survey across the ten largest Census Metropolitan Areas (CMAs) identified by the 2021 Census, ensuring a broad understanding of digital banking trends within this demographic. The specific demographic breakdown and targeted areas for the survey are detailed in **Table 1: Sample Calculations**, which lists the population of Canada's largest CMAs and the number of individuals aged 20 to 24 in these areas, providing a foundational demographic context for the study's sampling strategy.

Table 1: Sample Calculations.

Province	Canada's 10 largest Census Metropolitan Areas (CMAs), in 2021 and their total number populations	# of people between 20 and 24 years old as of 2021 in each CMA
Central Canada		
Quebec	Québec: 839,311	45,550
Quebec	Montréal: 4,291,732	257,910
Ontario	Toronto: 6,202,225	418,430
Ontario	Hamilton: 785,184	47,580
Ontario	Kitchener - Cambridge - Waterloo: 575,847	41,905
Ontario	Ottawa - Gatineau: 1,488,307	95,520
Total		**906,895**
Prairies		
Alberta	Calgary: 1,481,806	86,665
Alberta	Edmonton: 1,418,118	88,190
Manitoba	Winnipeg: 834,678	61,050
Total		**235,905**
West Coast		

British Columbia	Vancouver: 2,642,825	174,255
Total		**174,255**
Total Gen Z population between 20 and 24 years of age as of 2021 in the 3 Canadian regions		**1,317,055**

In determining the required sample size for this study, several online calculators were utilized to ensure the accuracy and reliability of the results. These tools included the Sample Size Calculator from OmniCalculator, Creative Research Systems, and Conjointly, which provided comprehensive calculations considering the desired confidence level and margin of error. These resources enabled the precise estimation of a sample size of 385 participants, reflecting the population distribution across Canada's major regions and ensuring the sample's representativeness for a robust analysis of Generation Z's digital banking behaviours.

To allocate the calculated sample size accurately across the regions, the proportions of the Generation Z population in each major region were computed to ensure representativeness across differing demographic densities. **Table 2: Calculating the proportions for each region** details these calculations, highlighting the percentage allocations based on the population data of Generation Z between 20 and 24 years old in each region. Central Canada, comprising the largest portion of the population, was allocated 68.86 percent of the sample, followed by the Prairies at 17.91 percent and the West Coast at 13.23 percent. These proportions were calculated using the total Gen Z population eligible for the study within these regions, ensuring that each region's sample size is proportionate to its population, thereby maintaining demographic integrity in the survey results.

Table 2: Calculating the Proportions for each Region.

Region	Calculation	%
Central Canada	= 906,895/1,317,055*100	68.86%
Prairies	=235,905/1,317,055*100	17.91%
West Coast	=174,255/1317,055*100	13.23%

Despite initial plans for wide-reaching recruitment through social media and academic platforms, the response was less than anticipated. To address this challenge and ensure a viable sample size, this study partnered with Centiment, a company specializing in sourcing research participants. Due to budget constraints, this collaboration enabled the acquisition of 316 participants, a deviation from the initially targeted 385. The sample was still stratified to reflect the regional distribution of Canada's Gen Z population, although with adjusted proportions based on the available budget. While every effort was made to avoid selection bias because of the reduced sample size, it cannot be guaranteed.

The recruitment adjustment ensured adherence to ethical standards, including informed consent, with participants receiving detailed information about the study's purpose and their rights. The survey, developed on the company's online platform, remained unchanged, consisting of structured questions to elicit insights into Gen Z's experiences with digital banking.

Research Objectives and Variables

The primary objective of this research is to examine the digital banking behaviours, preferences, and trust dynamics of Generation Z in Canada, focusing on those born between 1997 and 2001. This study aims to provide a comprehensive understanding of how this demographic interacts with digital banking platforms and to suggest actionable insights for the banking industry to effectively engage with Generation Z. To achieve this, the research will examine a comprehensive set of variables, each meticulously measured to ensure precision and relevance. Each variable will be operationalized with specific, measurable indicators, ensuring the data collected is quantifiable and directly relevant to the study's aims. The survey instrument will be designed to capture these variables accurately, allowing for a nuanced analysis of Gen Z's digital banking behaviours. This comprehensive approach ensures that the research captures a broad spectrum of factors influencing Gen Z's engagement with digital banking and addresses the intricate subtleties of their preferences and behaviours in the digital financial landscape.

Research Survey

The questionnaire developed for this research serves as a key instrument for data collection, specifically tailored to explore the digital banking behaviours of Generation Z in Canada. It is structured to systematically gather data on a variety of variables, including trust, usability, consumer engagement, and more, through a blend of Likert scale questions, multiple-choice options, and open-ended queries. This comprehensive questionnaire is designed to yield nuanced insights relevant to the study's objectives.

This placement ensures the study's main narrative remains focused and concise while providing complete transparency and accessibility to the research methodology.

Table 3: Research Survey Variables.

Variable	Scope/Description	KPIs to Examine
Integrated trust and marketing response	Evaluates Gen Z's trust in digital banking as influenced by marketing strategies. Addresses both trust aspects and marketing impact.	• Trust ratings in relation to marketing campaigns • Perception of ethical standards in marketing
Usability and technological innovation	Assesses the impact of usability on Gen Z's adoption of new digital banking technologies, focusing on interface design and ease of use.	• Rate of adoption for new features and technologies • Comparison of usability between different digital banking platforms
Engagement and personalization	Explores how personalized banking experiences influence Gen Z's engagement with digital banking platforms.	• Frequency of use correlated with preferences for personalized features • Engagement levels in relation to personalized financial advice
Social and ethical influence	Investigates how social influences and ethical considerations affect Gen Z’s digital banking choices, focusing on peer influence and ethical banking practices.	• Influence of social media and peers on banking choices • Importance of ethical banking practices in the choice of bank • Sensitivity to a bank’s environmental policies

Data Analysis

The data from the online survey facilitated through the partnership with Centiment will undergo a rigorous quantitative analysis process. As part of their service, Centiment will provide initial tables and an Excel spreadsheet containing the raw data collected from the 316 participants. This preliminary analysis will serve as a foundational layer for further in-depth examination and interpretation of this study's research objectives.

Upon receipt of the data from Centiment, the study will employ a targeted approach to analyze the data, focusing primarily on descriptive statistics to summarize the dataset and highlight the main characteristics and responses of participants. The analysis will be streamlined to concentrate on descriptive insights that directly inform Gen Z's digital banking behaviours, preferences, and trust dynamics. This focused approach will allow for a clearer presentation of the core findings relevant to the research objectives.

Statistical software such as SPSS will be used for this purpose, chosen for its capabilities in handling complex datasets and performing various statistical tests efficiently. These tools will be instrumental in accurately processing the survey data and ensuring the integrity of the analysis, thereby aiding in the clear presentation and interpretation of the findings.

To further ensure the validity and reliability of these findings, the study will implement several measures, including a careful review of the survey design, to reduce biases and ensure that the questions accurately capture the intended variables. The sampling method, adapted to the realities of the research process and facilitated by Centiment, will contribute to the study's validity by aiming for a representative sample of the Gen Z population within the logistical constraints encountered. These steps will be crucial in maintaining the scientific rigour of the study, allowing for a dependable and valid interpretation of Gen Z's engagement with digital banking.

The study will also include a thorough assessment of any potential confounding variables and explore patterns within the data, critically evaluating the results to provide credible insights into Gen Z's digital banking trends in Canada. By building upon the initial data set received from Centiment and conducting a detailed statistical analysis, this research aims to present a comprehensive view of the subject matter, contributing valuable insights to both academic discourse and practical applications within the banking industry.

Ethical Considerations

This research involving human participants has been designed with stringent adherence to ethical principles. Key considerations include ensuring confidentiality and privacy of participant data, obtaining informed consent, and respecting participants' rights to withdraw from the study at any time.

Given the use of data provided by Centiment, it is also pertinent to ensure that the data handling practices meet ethical standards. This includes verifying that Centiment's data collection processes align with ethical guidelines concerning privacy, confidentiality, and informed consent. The study will ensure that all data received is anonymized and that participants' privacy is upheld.

Limitations and Challenges

This study, while methodologically robust and comprehensive, acknowledges several limitations that have arisen due to practical constraints and adjustments in the research approach. The primary limitation is the reduced sample size, from 385 to 316 participants. This reduction, driven by budgetary limitations and the necessity of partnering with Centiment for participant recruitment, potentially affects the generalizability of the findings across Canada's Gen Z demographic. Despite efforts to maintain a representative sample, the smaller cohort may reduce the analysis's statistical robustness.

Furthermore, the reliance on a third-party company, Centiment, for the sourcing of participants and the provision of preliminary data analysis introduces a dependency on their methodology, recruitment strategies, and data processing practices. While this partnership has enabled the continuation of the research within the constraints encountered, it also necessitates trust in the quality and ethical standards of Centiment's data collection processes.

Additionally, the online survey method, while effective in reaching a dispersed and diverse demographic, may introduce biases such as self-selection and social desirability biases. These biases could influence the responses, with participants who are more digitally savvy or have strong opinions about digital banking being more likely to participate. To mitigate these effects, the survey design aimed to be neutral and inclusive, encouraging honest and varied responses.

The study also faces the challenge of maintaining participant engagement throughout the survey process, especially given the indirect recruitment through Centiment. Strategies to overcome this include ensuring the survey is concise and communicating its significance and relevance to potential participants.

Despite these limitations and challenges, the research design and methodology have been carefully crafted to address and mitigate their impacts as much as possible. The study remains committed to providing valuable insights into the digital banking behaviours of Generation Z in Canada, contributing to both academic knowledge and practical applications in the banking industry. While presenting challenges, the partnership with Centiment also offers a unique opportunity to explore this demographic's banking behaviours through a new lens, enriching the research with a diverse range of perspectives and experiences.

The methodology has been designed to reflect an evolved approach, which underscores a commitment to exploring digital banking behaviours among Canada's Generation Z. Confronted with practical constraints, the research design was adeptly adapted, ensuring the study's integrity and relevance.

Our collaboration with Centiment has been pivotal, facilitating access to a targeted sample within the confines of budgetary and logistical limitations. This partnership has not only allowed the research to progress but also provided a foundational data set, which was analyzed to enhance the depth of the investigation. The integration of this data underscores the flexibility inherent in the research methodology, guaranteeing a robust and empirically grounded study.

Findings

The survey garnered responses from 316 individuals born between 1997 and 2001 residing in major urban centers across Canada. The demographic data collected offers insights into the age, geographical distribution, employment status, educational attainment, and gender identification of the participants. This foundational demographic information is essential for understanding the context of digital banking behaviours among Generation Z in Canada.

Age Distribution

The age range of participants was 23 to 27 years, capturing the full spectrum of Generation Z within the study's scope. The distribution is as follows:

- 29% were 23 years old,
- 16% were 24 years old,
- 19% were 25 years old,
- 17% were 26 years old,
- 19% were 27 years old.

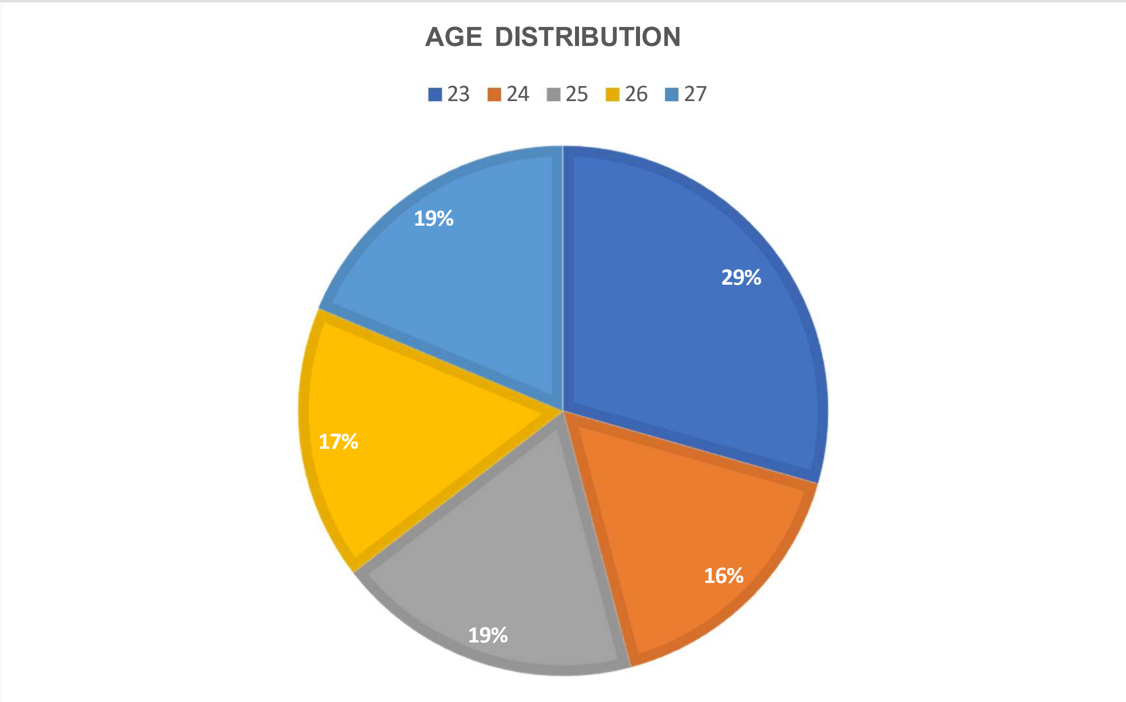

Figure 1: Age distribution of the survey participants.

Geographical Representation

Participants hailed from various provinces, indicating the regional diversity of digital banking users within this demographic:

- Ontario: 47.15%,
- Quebec: 20.89%,
- Alberta: 13.61%,

- Manitoba: 4.11%,
- British Columbia: 14.24%.

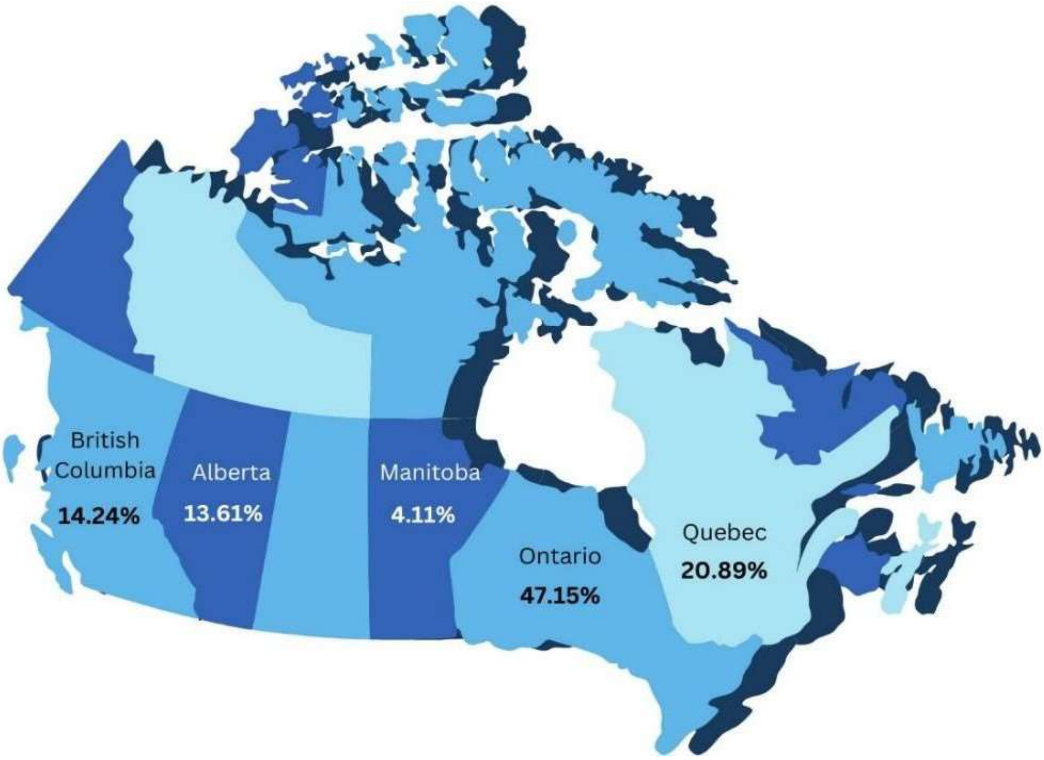

Figure 2: Geographic distribution of participants.

Employment Status

The employment status of respondents varied, providing insights into their financial engagement:

- Full-time employment: 57.28%,
- Part-time employment: 17.41%,
- Unemployed: 10.13%,
- Students: 13.61%,
- Other employment statuses: 1.58%.

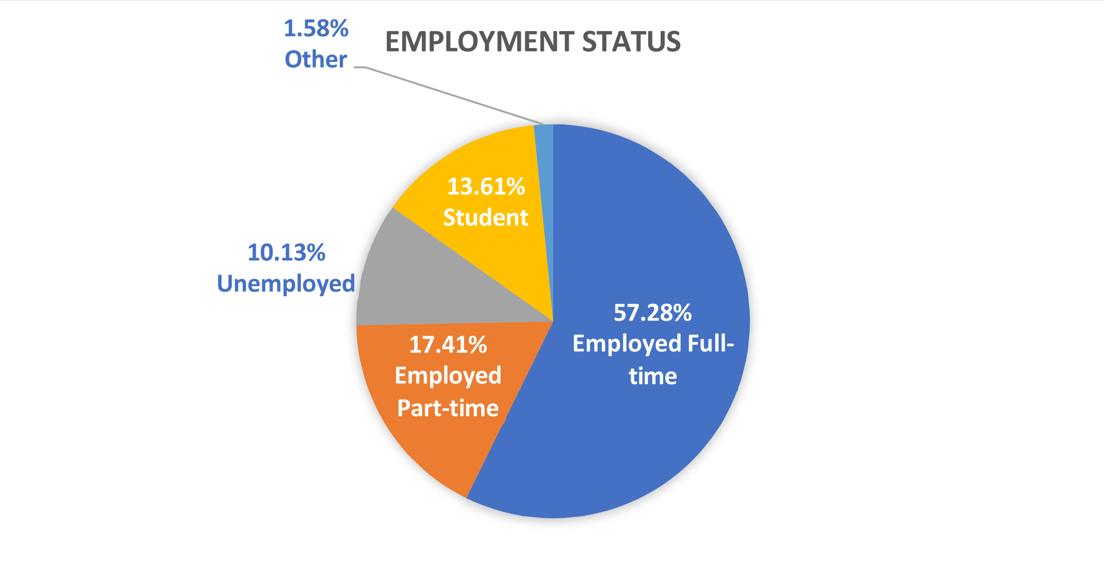

Figure 3: Employment status of survey participants.

Educational Attainment

Educational backgrounds among the participants were diverse, which could influence their digital banking behaviours:

- Some high school education: 4.11%,
- Completed high school: 21.20%,
- Trade or Technical education: 5.06%,
- College or University degrees: 58.23%,
- Postgraduate education: 10.13%,
- Other forms of education: 1%.

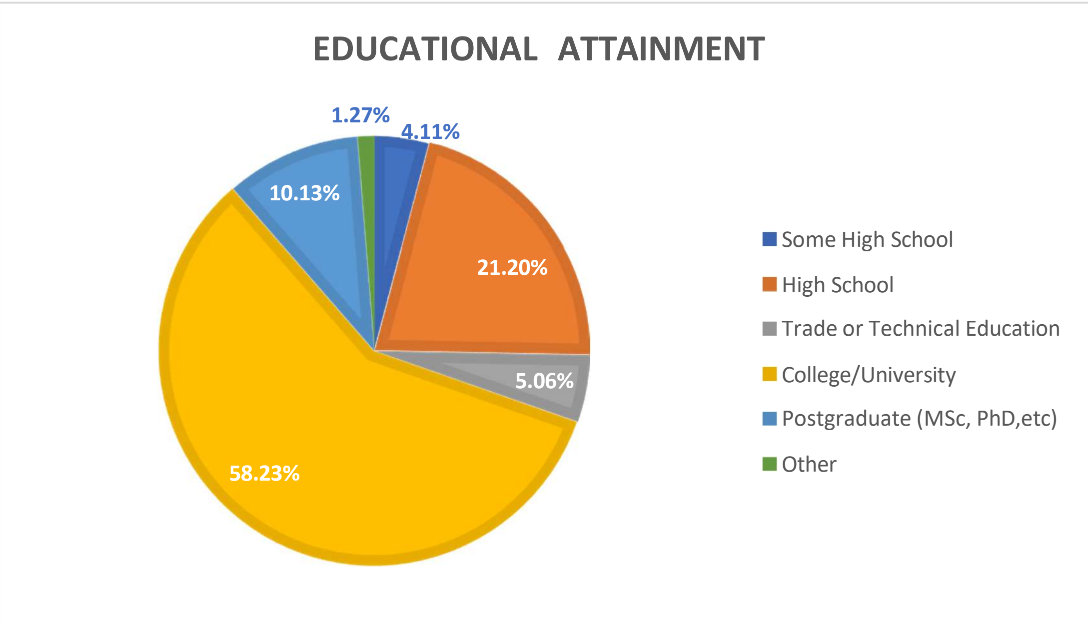

Figure 4: Educational attainment of survey participants.

Gender Distribution

The survey ensured a gender-inclusive approach:

- Male: 48.42%,
- Female: 50.95%,
- Non-binary: 0.63%.

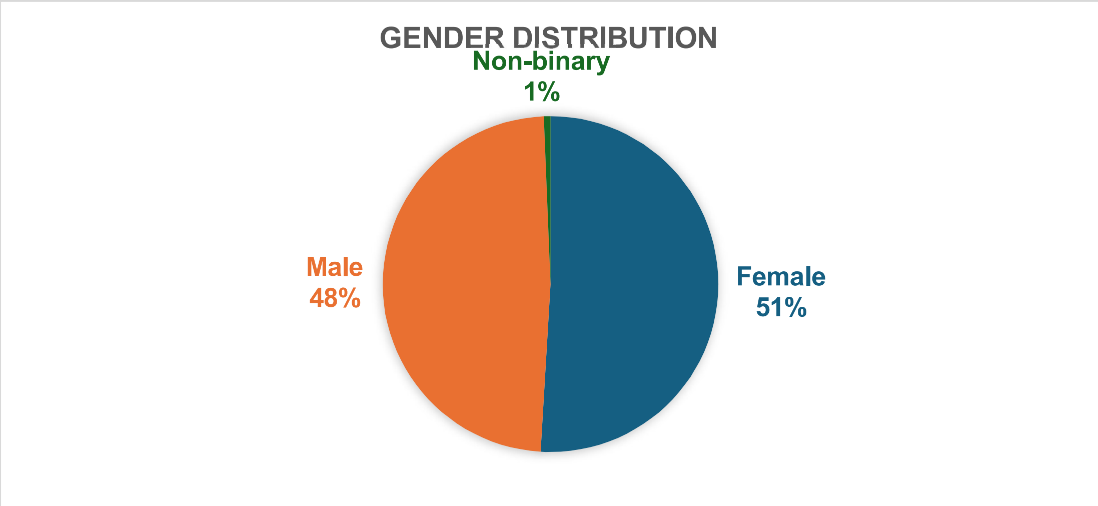

Figure 5: Gender distribution of survey participants.

This demographic breakdown underscores the diversity within Generation Z's digital banking users in Canada, touching upon various aspects of financial independence, regional differences, and varied financial engagement due to employment and education levels. Additionally, the inclusivity in gender representation provides a foundation for understanding the broad spectrum of digital banking trends within this cohort. The subsequent sections will delve into how these demographic factors correlate with digital banking adoption rates, preferences, and trust dynamics among Generation Z in Canada without drawing conclusions on their broader implications until the analysis chapter.

Adoption of Digital Banking Platforms

Digital Banking Platform Usage

The survey revealed a high adoption rate of digital banking platforms (web-based and mobile banking applications) among Generation Z participants. With 90% of respondents indicating they use either web-based online banking or mobile banking apps, the data underscores the prevalent integration of digital solutions in financial activities within this age group. Only 10% of respondents do not use any digital banking platforms.

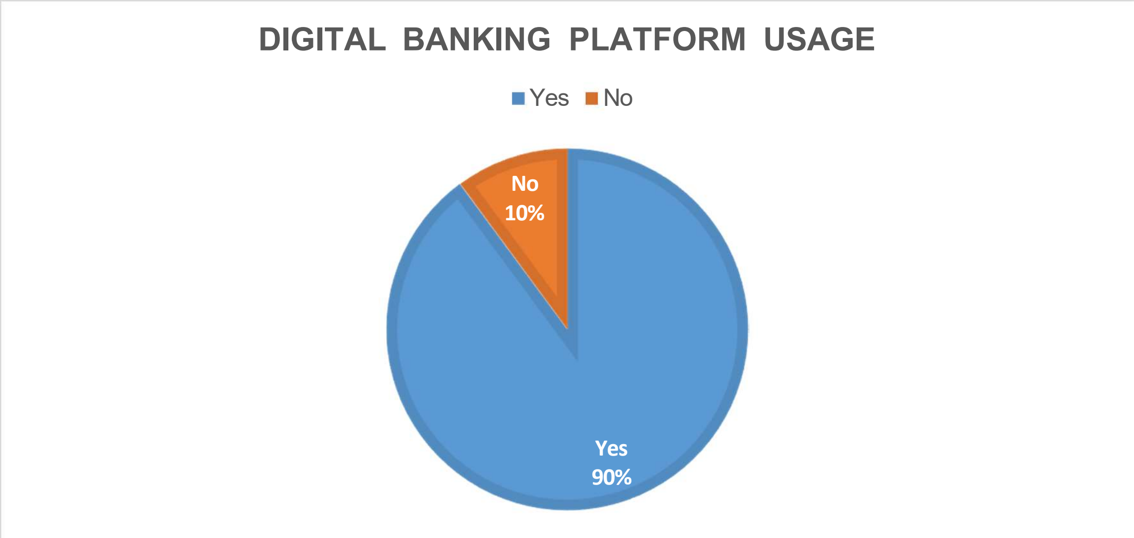

Figure 6: Digital Banking Platform Usage Among Participants.

Reasons for Non-Usage

For those who abstain from using digital banking platforms, security concerns and a preference for traditional banking methods were the most cited reasons. Some participants expressed distrust in digital banking security, while others preferred the tangibility of cash handling or found digital platforms unnecessary for their banking needs.

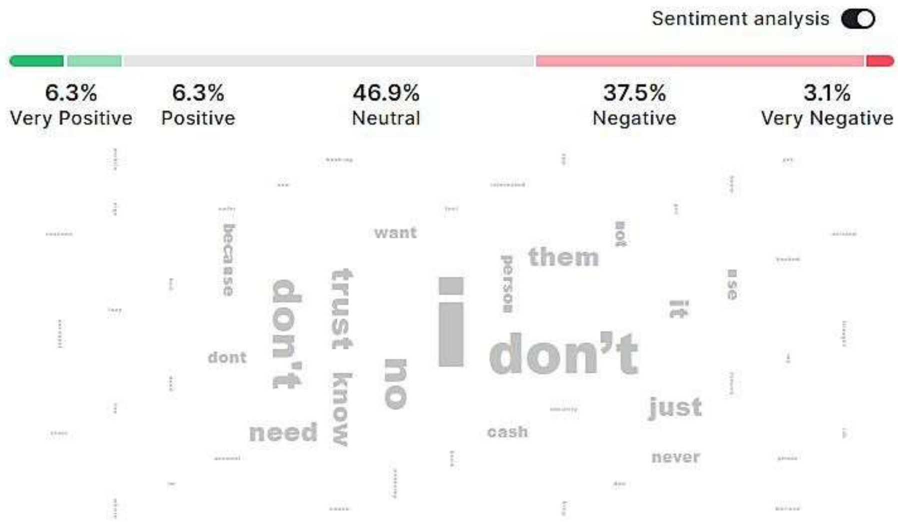

Figure 7: Sentiment Analysis, provided by Centiment, of Non-Usage Reasons for Digital Banking.

Digital Banking Platform Preference

The survey queried Generation Z participants on their usage of digital banking platforms, distinguishing between web-based online banking and mobile banking applications. The collected data indicates a notable preference among the respondents: 84.86% utilize mobile banking applications for their digital banking needs, whereas only 15.14% opt for web-based online banking platforms.

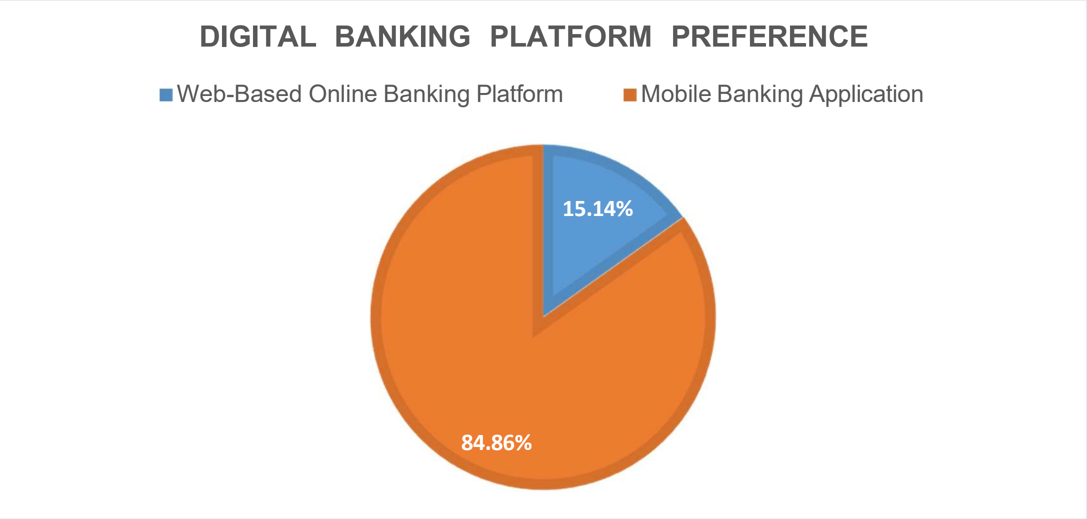

Figure 8: Preferences for Web-based Online Banking vs. Mobile Banking Applications.

The survey's findings on the adoption of digital banking platforms provide a clear snapshot of Generation Z's banking behaviours, pointing to a robust integration of technology in their financial dealings. While the data suggests a broad acceptance of digital banking among this cohort, it also reveals areas where banks could further innovate or reinforce trust to capture the entirety of this demographic's banking potential.

Integrated Trust and Marketing Response

The survey addressed critical dimensions of trust and marketing in digital banking among Generation Z in Canada. It explored participants' confidence in the security of digital banking platforms and evaluated how marketing campaigns influence their banking decisions.

Confidence in Security

Respondents showcased a generally positive outlook towards the security of their digital banking platforms, with a significant majority expressing high to very high levels of confidence. Specifically:

- A small minority, 1.76%, reported not being confident at all.
- Only 2.11% rated their confidence level as 2 out of 5.
- A moderate 17.96% gave a neutral score of 3.
- The largest group, 46.48%, expressed high confidence with a score of 4.
- A significant 31.69% of participants indicated they were extremely confident, rating their trust in digital banking security as 5 out of 5.

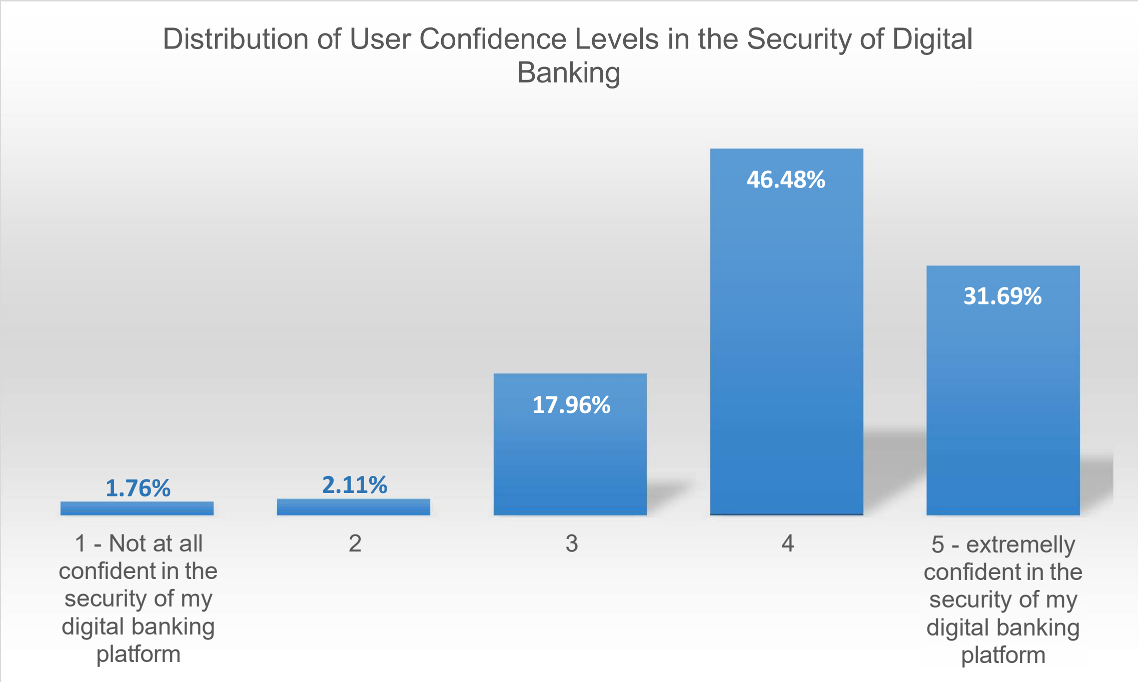

Figure 9: Representation of GenZ's confidence in the security of digital banking platforms.

These findings suggest that while security concerns exist, they do not significantly deter the majority of Generation Z users from engaging with digital banking services. The high levels of confidence reported could be indicative of successful security measures implemented by digital banking platforms or a general comfort with digital technology among this demographic.

Influence of Marketing Campaigns

The impact of marketing campaigns on Generation Z's use of digital banking services was found to vary, with responses indicating:

- that marketing campaigns never influence their decisions: 15.49%,
- they are rarely influenced by marketing campaigns: 33.1%,
- a similar portion, 32.75%, indicated that they are occasionally swayed by marketing efforts,
- 14.44% often find themselves influenced by marketing campaigns, and
- Only 4.23% reported being very often influenced by marketing when choosing digital banking services.

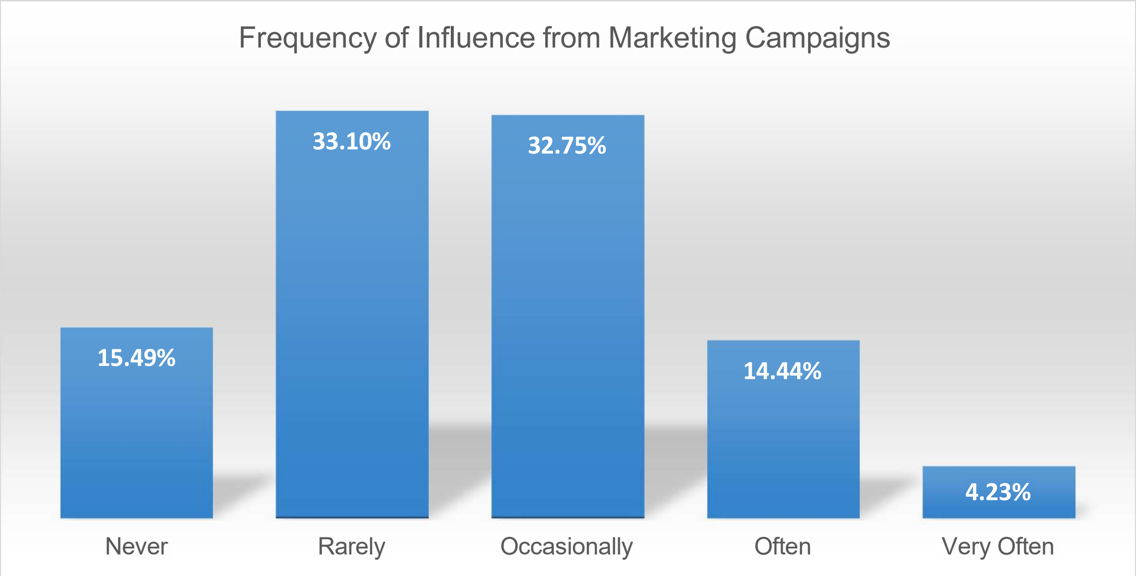

Figure 10: Frequency of influence from Marketing Campaigns.

This diverse response to marketing efforts highlights a nuanced view among Generation Z, suggesting that while marketing has an impact, many within this demographic rely on other factors, such as security, usability, and personal recommendations, when choosing digital banking services.

The survey's insights into trust and marketing responses not only reflect Generation Z's confidence in digital banking security but also reveal the limited yet significant role of marketing in influencing their banking decisions. These findings lay the groundwork for further analysis on how financial institutions can enhance trust and effectively engage with this tech-savvy demographic through targeted marketing strategies.

Usability and Technological Innovation

The exploration of usability and technological innovation within digital banking platforms highlighted Generation Z's preferences and behaviours when engaging with these services. This section delves into session duration and the adoption rate of new banking technologies among this demographic.

Session Duration

The survey findings reveal insightful patterns regarding the time Generation Z spends on digital banking platforms:

- A significant 31.69% of respondents complete their banking activities in less than 5 minutes, emphasizing efficiency and speed in their interactions.
- The majority, 53.17%, spend between 5 to 10 minutes per session, suggesting a balance between quick transactions and more detailed financial management.
- A smaller segment of 12.68% uses digital banking for 11 to 20 minutes, possibly reflecting more complex banking needs or thorough financial planning.

- Only 2.46% spend more than 20 minutes per session, indicating either engagement with comprehensive banking activities or challenges in navigating the platforms.

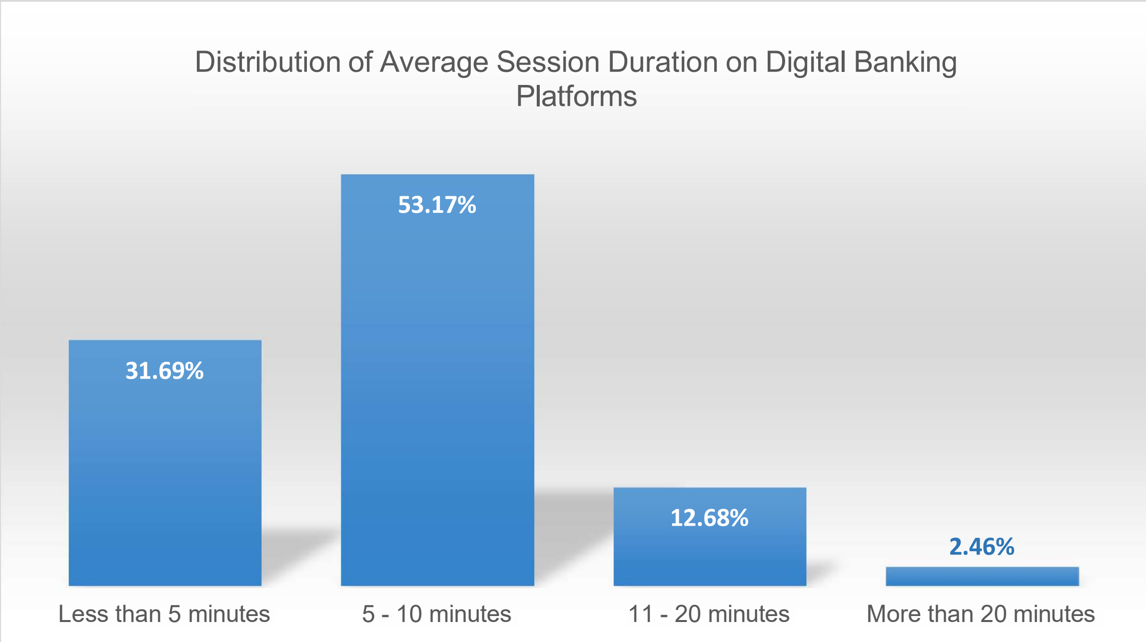

Figure 11: Average Session Duration reported by the survey participants.

Adoption of New Technology

When it comes to embracing new banking technologies, Generation Z's attitudes display a spectrum of readiness:

- 18.31% of participants are eager to adopt new technologies immediately, showcasing a strong inclination towards innovation and digital advancements.
- Almost half, 46.13%, prefer to adopt new technology soon after it proves to be reliable, indicating a cautious but progressive approach.
- 29.58% wait to see widespread adoption by others before deciding, reflecting a pragmatic stance towards new banking tools and features.
- A mere 4.23% are among the last to adopt, and an even smaller group, 1.76%, indicate they do not adopt new technologies at all, underscoring diverse comfort levels and trust in digital banking innovations.

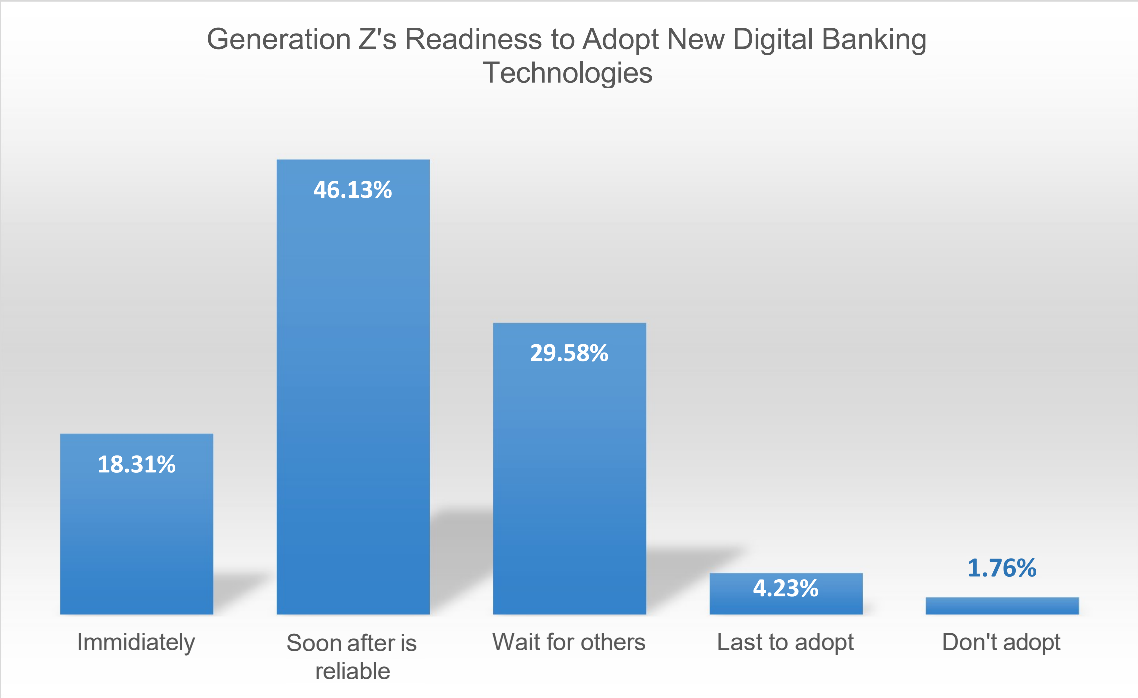

Figure 12: Frequency of new Digital Banking adoption reported by the survey participants.

These insights into usability and technological innovation underline the importance of efficient, user-friendly digital banking experiences for Generation Z. Additionally, the data on technological adoption rates suggest a keen interest in innovation, balanced by a cautious evaluation of new technologies' reliability and utility. This section highlights Generation Z's dynamic engagement with digital banking platforms, emphasizing the critical role of usability and technological advancements in catering to their banking preferences and needs.

Consumer Engagement and Personalization

This section examines the frequency of digital banking interactions and the significance of personalization in digital banking platforms among Generation Z consumers.

Digital Banking Login Frequency

The survey results on login frequency reveal distinct patterns of engagement with digital banking platforms:

- A minority of participants,4.58%, do not engage with their digital banking weekly, suggesting varying degrees of financial activity or preference for periodic account management.
- Half of the respondents - exactly 50% - login 1 to 3 times per week, indicating routine engagement for basic financial transactions or account monitoring.
- A considerable 28.17% access their banking platform 4 to 6 times per week, demonstrating a consistent interaction pattern, likely for daily financial management or monitoring.

- A segment of highly engaged users, 13.03%, logs in between 7 to 10 times weekly, reflecting higher engagement levels and
- A dedicated 4.23% log in more than ten times per week, indicating very frequent usage, potentially for both routine transactions and active financial management.

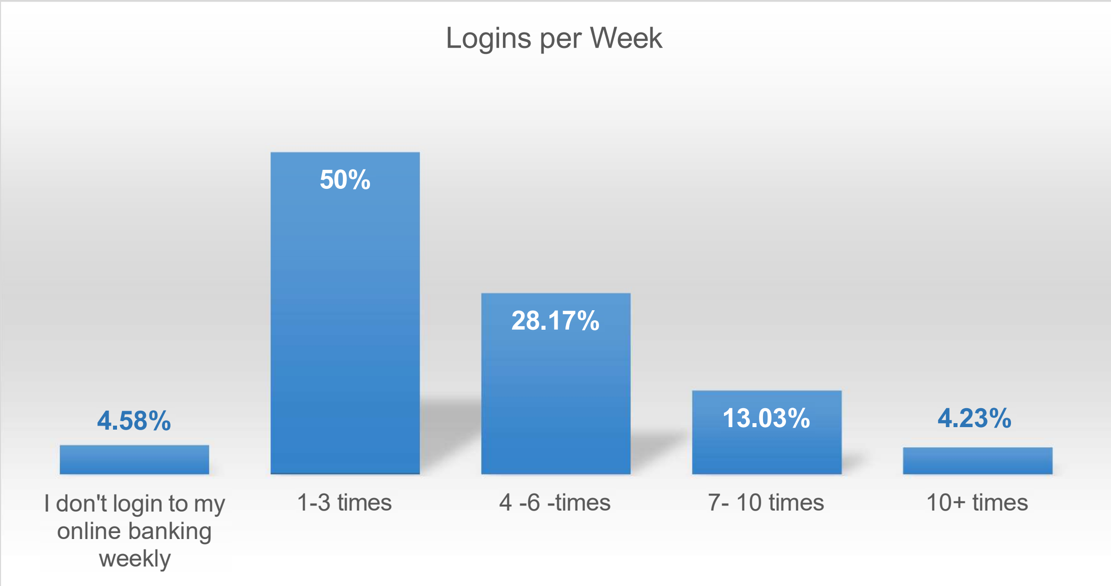

Figure 13: Frequency of Digital Banking logins per week by the survey participants.

Importance of Personalized Digital Banking Experience

The value placed on personalization within digital banking platforms was assessed, showing a broad acknowledgment of its importance:

- A mere 2.11% rated the personalized experience as not important at all.
- Only 4.58% gave it a low importance rating of 2 out of 5.
- 26.76% took a neutral stance, rating it a 3, showing some ambivalence towards personalization.
- A plurality, 35.21%, rated the importance of personalization as 4.
- A significant portion, 31.34%, consider personalized digital banking experiences as extremely important, rating it a 5.

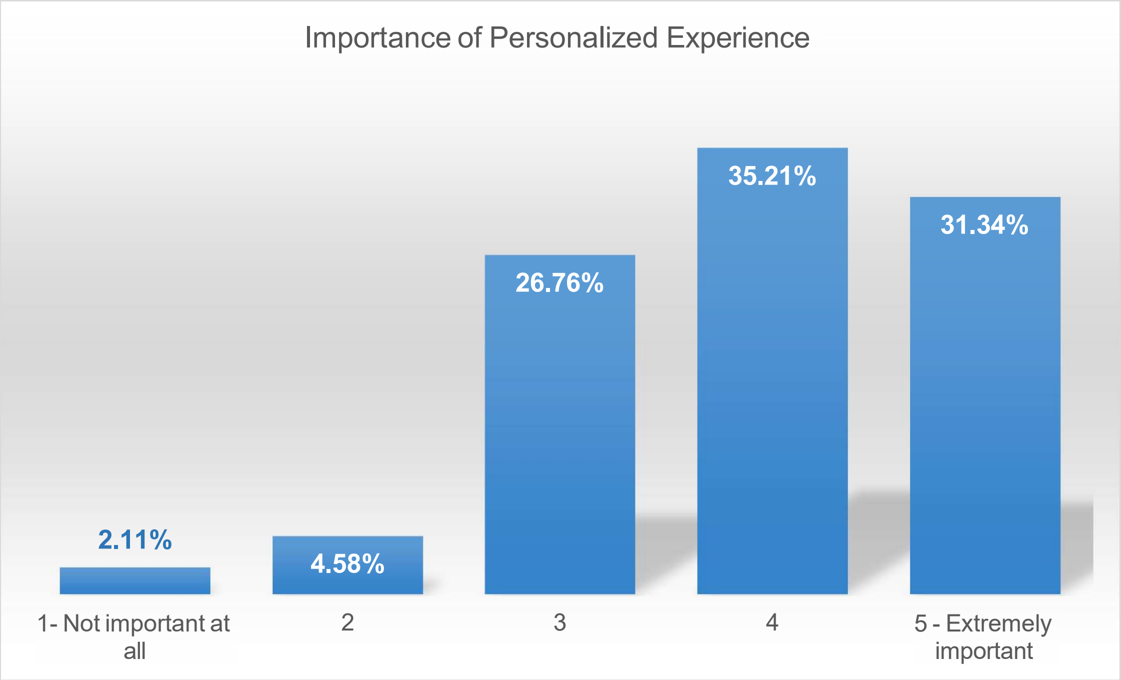

Figure 14: How important the survey participants find personalized experience within their digital banking usage.

These findings highlight a strong inclination towards personalized banking experiences among Generation Z users, alongside routine engagement with digital banking platforms. The emphasis on personalization points to a desire for banking services that not only meet their financial needs but also resonate with their individual preferences and lifestyles, suggesting a pathway for financial institutions to enhance user engagement and satisfaction through tailored services and interactions.

Social and Ethical Influence

This section explores the influence of social factors and ethical considerations on Generation Z's digital banking choices, highlighting the importance of personal relationships and a bank's environmental and ethical policies in its decision-making process.

Influence of Family, Friends, and Social Media

The survey data indicates that family and friends significantly impact Generation Z's digital banking choices, with a majority of respondents acknowledging at least some level of influence from these personal relationships. In contrast, social media influencers wield a lesser impact, suggesting that direct personal connections hold more sway over banking decisions than online personalities.

● *Influence of family*

When it comes to family influence, respondents indicated varying degrees:

- A modest 9.2% felt no influence from their family (1 out of 5).
- 8.1% rated the influence as low (2 out of 5).
- The largest group, 32%, gave a neutral score (3 out of 5), suggesting some family influence on their choices.
- 26.8% felt their family had a strong influence (4 out of 5).
- Nearly a quarter, 23.9%, believed their family had a significant influence (5 out of 5).

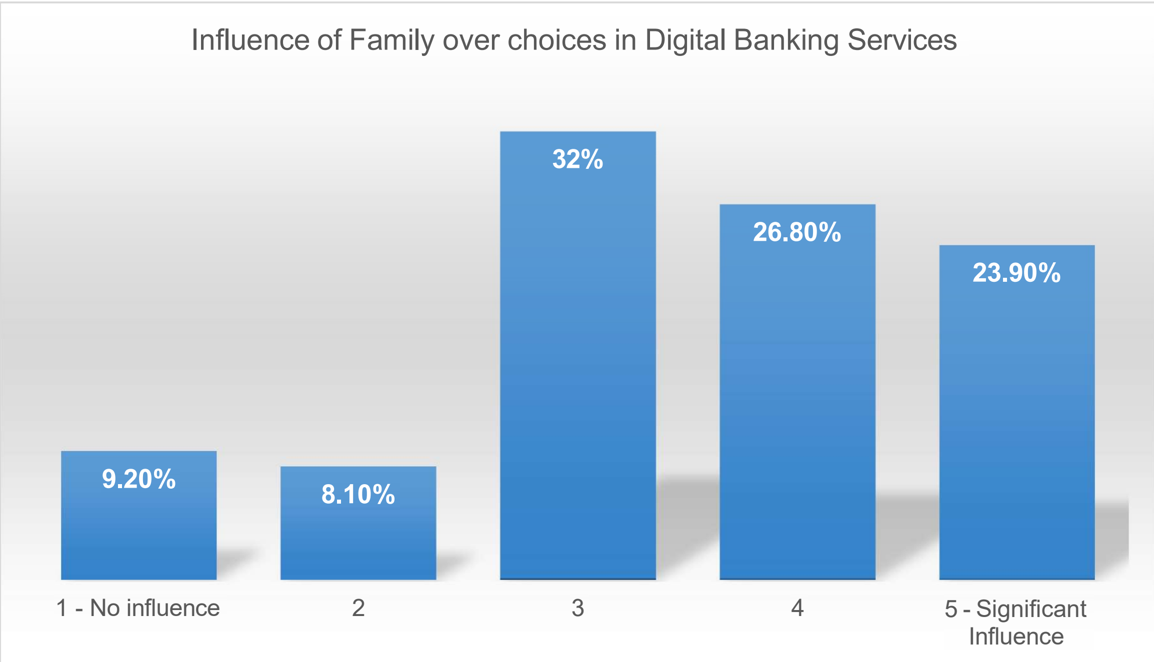

Figure 15: How much influence family has over choices in Digital Banking Services.

● *Influence of friends*

For friends' influence, the responses were slightly less weighted towards significant influence:

- 12% reported no influence from friends (1 out of 5).
- 14.4% felt a low level of influence (2 out of 5).

- A third, 33.5%, gave a neutral score (3 out of 5).
- 26.1% indicated a strong influence (4 out of 5).
- 14.1% felt friends had a significant influence on their digital banking choices (5 out of 5).

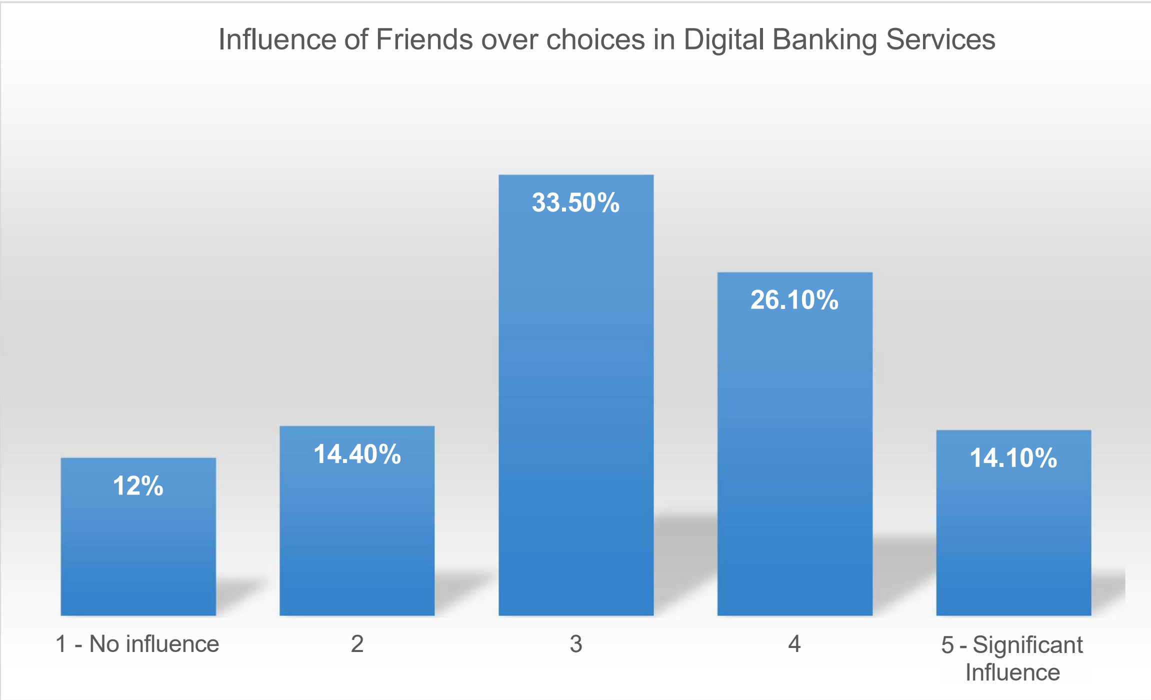

Figure 16: How much influence family has over choices in Digital Banking Services.

- *Influence of social media influencers*

Social media influencers appeared to have a lesser impact on digital banking choices among respondents:

- A significant 31% reported no influence from social media influencers (1 out of 5).
- 23.9% rated the influence as low (2 out of 5).
- A quarter, 25%, were neutral (3 out of 5).
- 11.6% felt a strong influence (4 out of 5).
- Only 8.5% reported a significant influence from social media influencers (5 out of 5).

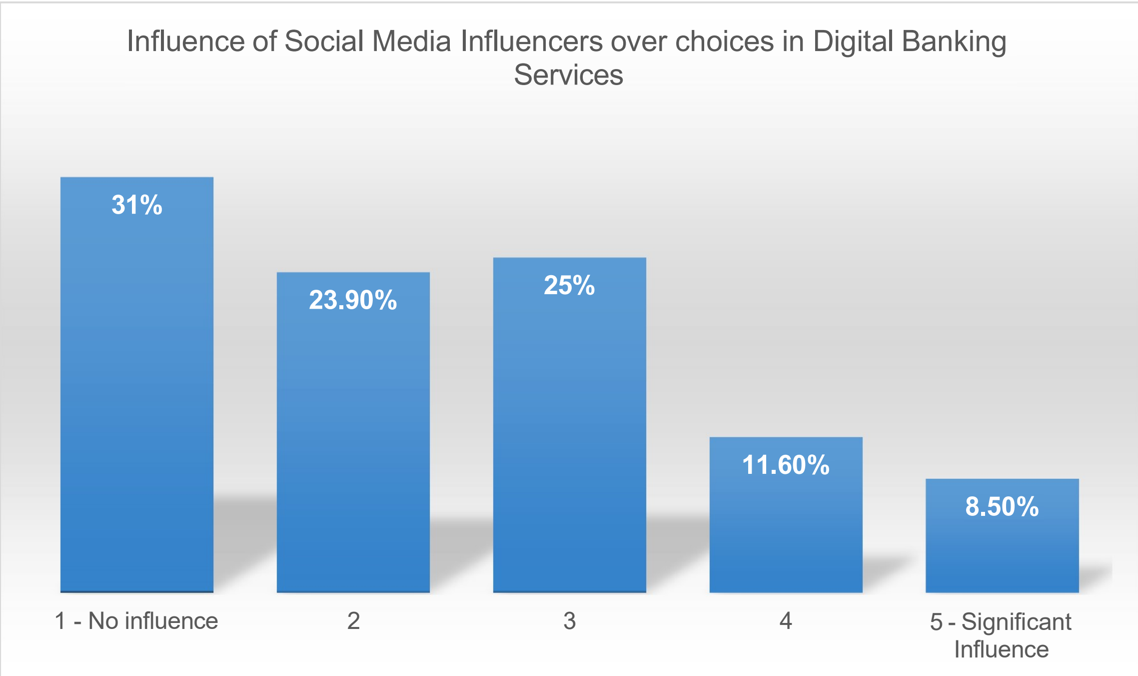

Figure 17: How much influence Social Media Influencers have over choices in Digital Banking Services.

Importance of Bank's Environmental and Ethical Policies

The findings also reveal a considerable emphasis on the environmental and ethical policies of banks. A significant portion of respondents rate these factors as important to very important in their choice of digital banking services. This trend underscores Generation Z's preference for banks that align with their values on sustainability and ethical practices, highlighting the growing importance of corporate social responsibility in attracting and retaining this demographic.

- A small 2.82% considered it unimportant (1 out of 5).
- 5.28% rated it as slightly important (2 out of 5).
- A moderate 23.24% gave a neutral score (3 out of 5).
- A significant 36.62% found these policies to be important (4 out of 5).
- And 32.04% rated the importance of such policies as extremely important (5 out of 5).

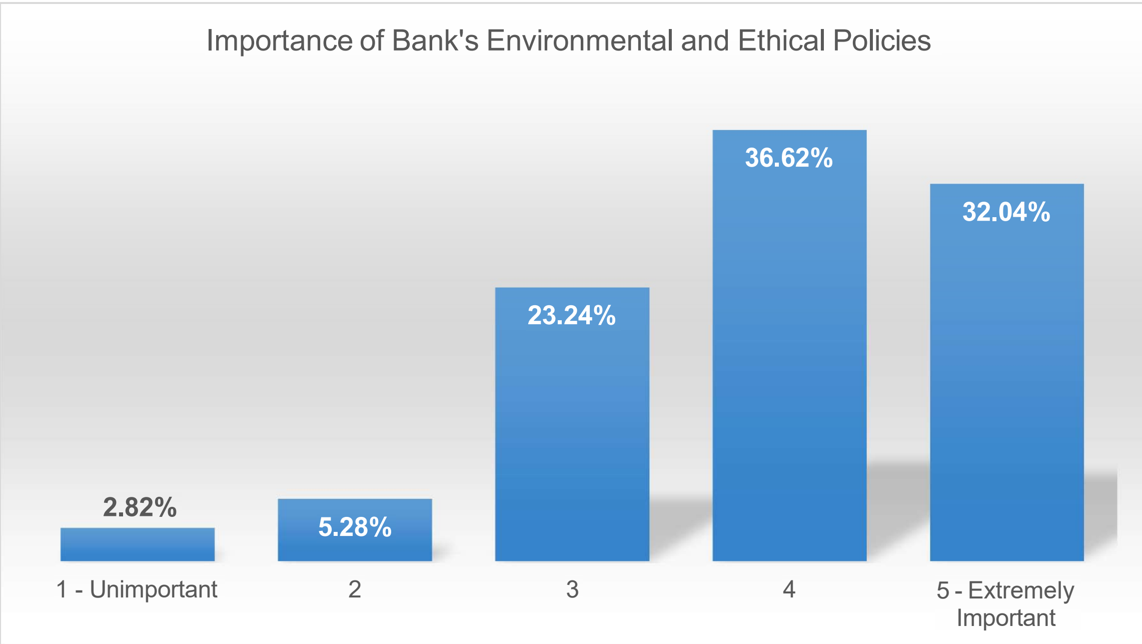

Figure 18: How important are a Bank's environmental and ethical policies when choosing Digital Banking Services.

Overall, these insights demonstrate that social relationships and ethical considerations play crucial roles in shaping Generation Z's engagement with digital banking, pointing towards the need for financial institutions to foster trust through transparent and value-driven practices.

Cultural and Economic Influences

This section delves into how cultural values and economic factors influence Generation Z's preferences and choices in digital banking, underscoring the importance of inclusivity and financial considerations in banking services.

Impact of Cultural Values

The survey highlighted that cultural values significantly impact Generation Z's preferences for digital banking features. This includes language options, currency types, and transaction types common in their culture, indicating a demand for banking services that are inclusive and reflective of diverse cultural backgrounds.

- *Language options*

A majority saw at least a moderate impact,

- with 17.3% indicating no impact,
- 8.5% slight impact,
- 28.5% moderate impact,
- 21.5% strong impact, and
- 24.3% significant impact.

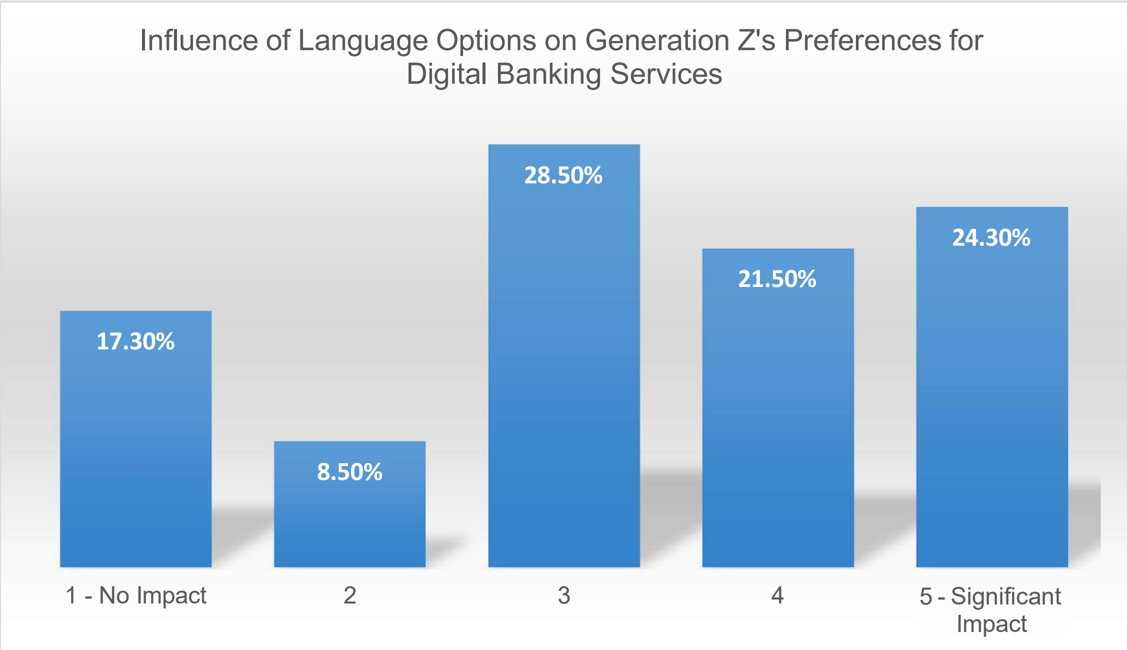

Figure 19: How strongly cultural values impact the survey's participants' preferences when choosing Digital Banking Services.

- *Currency types*

A majority felt currency types had at least a moderate impact on their preferences, with

- 9.9% stating no impact,
- 8.1% slight impact,
- 28.2% moderate impact,
- 28.5% strong impact, and

- 25.4% significant impact.

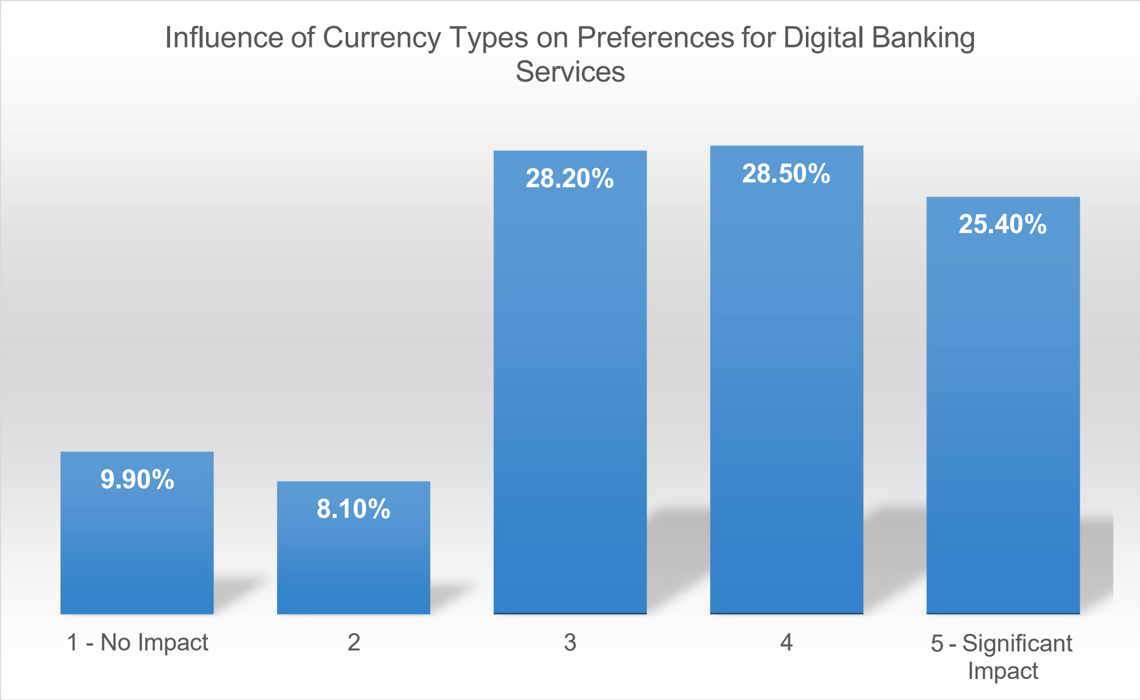

Figure 20: How strongly currency types impact the survey's participants' preferences when choosing Digital Banking Services.

- *Transaction types common in one's culture.*

Similarly, most participants reported at least a moderate impact, with

- 13.4% stating no impact,
- 10.9% slight impact,
- 28.2% moderate impact,
- 25.4% strong impact, and
- 22.2% significant impact

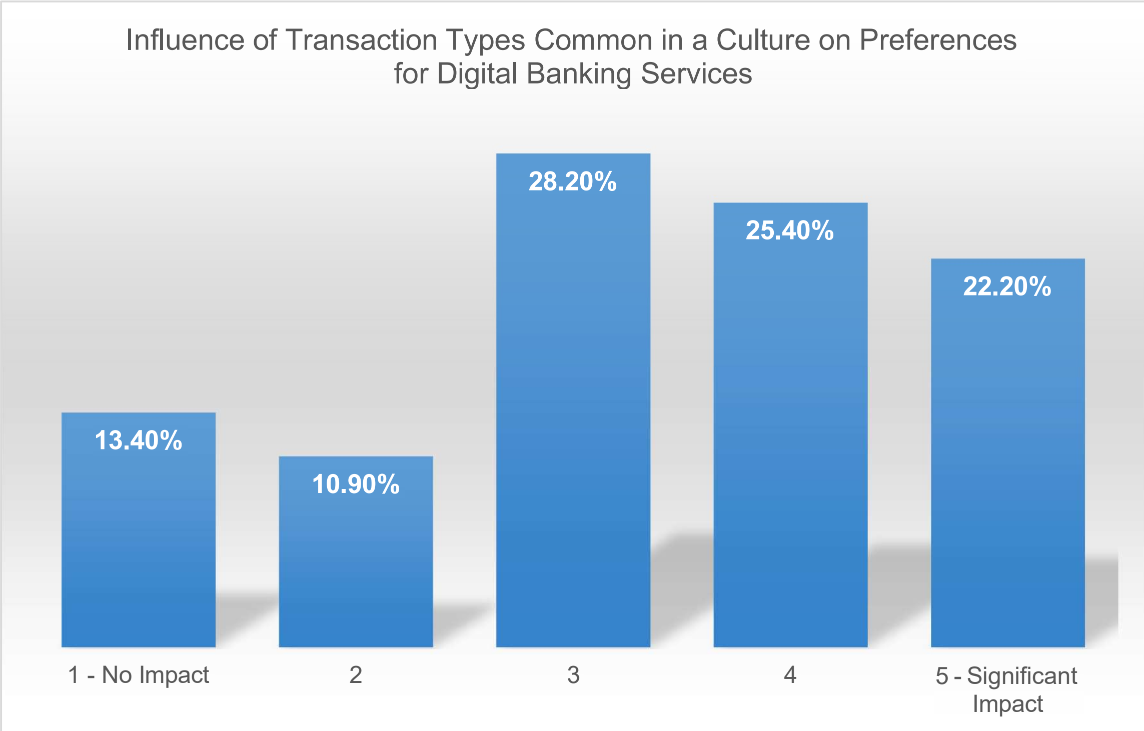

Figure 21: How strongly Transaction Types Common in a Culture impact the survey's participants' preferences when choosing Digital Banking Services.

Importance of Economic Factors

Economic considerations, such as fees and interest rates, play a critical role in Generation Z's selection of digital banking services. A majority of respondents consider these factors important to very important, suggesting that competitive pricing and financial benefits are key determinants in their banking decisions.

When it comes to economic factors such as fees and interest rates:

- 1.76% of the participants found these factors to be not important at all.
- 9.15% considered them somewhat important.
- 23.24% were neutral.
- A notable 32.39% found these factors to be important.
- The largest group, 33.45%, rated them as very important.

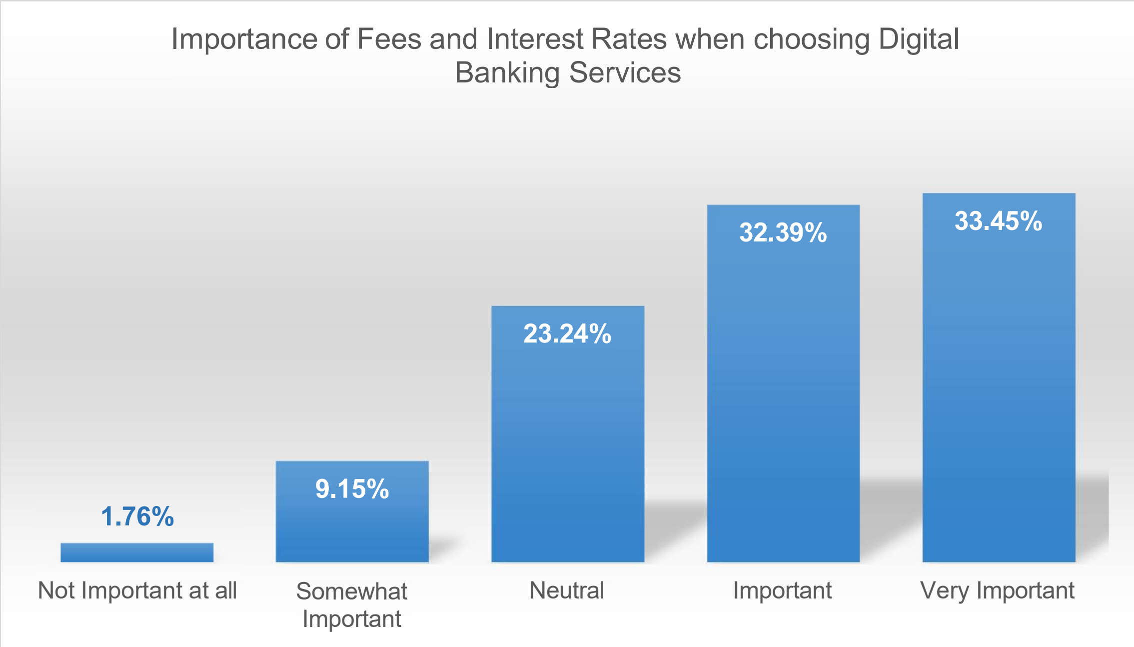

Figure 22: Importance of Fees and Interest Rates when choosing Digital Banking Services.

Together, these insights suggest that banks aiming to engage Generation Z effectively must offer culturally inclusive services and competitive economic benefits, aligning with the demographic's values and financial priorities.

In conclusion, the findings from the survey offer a detailed snapshot of Generation Z's digital banking behaviours, preferences, and trust dynamics in Canada. Through examining diverse demographic profiles, adoption rates of digital platforms, the impact of marketing campaigns, and the influence of social, cultural, and economic factors, a complex yet coherent picture of Generation Z's engagement with digital banking emerges. This demographic's pronounced preference for mobile banking applications, alongside their nuanced responses to security, marketing influences, usability, and the importance of banks' ethical policies, underscores the multifaceted nature of their digital banking interactions. As we transition to the analysis chapter, these findings will be further explored to unpack the underlying motivations, perceptions, and attitudes driving these behaviours. The subsequent analysis will delve deeper into interpreting how these preferences and behaviours align with broader technological trends, societal shifts, and economic considerations, ultimately aiming to provide actionable insights for financial institutions looking to engage this pivotal demographic effectively.

Analysis and Discussion

In this analysis, several groundbreaking findings emerged that not only underscore the distinctive digital banking behaviours and preferences of Generation Z in Canada but also reveal compelling insights that were not fully anticipated in the existing literature. Most notably, existing studies, including the Canadian Bankers Association (2022), report that 46 percent of Gen Z prefer using mobile apps for their banking needs. Our findings, however, indicate an overwhelming dominance, with 90% of respondents favouring mobile platforms for their banking needs. This substantial preference, which significantly exceeds previous estimations, underscores a rapid acceleration toward mobile-first banking strategies and highlights a deeper integration and reliance on mobile platforms than previously understood.

Furthermore, our study unveiled a notably high confidence among Gen Z in the security of digital banking platforms—a finding that contrasts sharply with the prevalent skepticism about digital security often highlighted in academic discussions and media. This suggests that Canadian financial institutions may have been particularly successful in communicating their security measures or that Gen Z's familiarity with digital technology may predispose them to greater trust in digital security protocols.

Another unexpected finding was the significant regard for the ethical and environmental policies of financial institutions. While it is recognized that Gen Z values sustainability, the degree to which these factors influence banking choices was particularly striking, suggesting a critical area for financial institutions to differentiate themselves in an increasingly competitive market.

Additionally, the analysis revealed that the influence of family and friends in banking decisions was more pronounced than that of social media influencers. Contrary to popular belief that social media influencers have a predominant impact, our data shows that only a small fraction of Gen Z is significantly swayed by influencers when making banking decisions. This suggests a potential shift or undervalued dimension in how personal relationships impact financial decisions among young consumers, contrary to the heavy focus on social media influence often presumed in marketing strategies.

Moreover, while marketing campaigns have some influence on Gen Z’s banking decisions, our findings indicate that this influence is moderate. The data suggests that while marketing is considered, it is not the primary determinant of Gen Z's banking choices. This highlights the need for financial institutions to employ more authentic and personalized marketing strategies that resonate deeply with Gen Z's values and preferences rather than relying on traditional advertising techniques.

These findings provide critical insights into the preferences of Gen Z, guiding banks in refining their digital offerings and engagement strategies to align with the expectations and values of this key demographic. This nuanced understanding encourages a reevaluation of current marketing and operational strategies to better cater to the needs of Generation Z, ensuring that financial institutions remain relevant and preferred among this digitally native and rapidly influential demographic.

Digital Banking Behaviours of Generation Z

The statistical analysis delves into Generation Z's digital banking behaviours, shedding light on how this influential demographic interacts with banking platforms and prioritizes various aspects of the digital banking experience.

The data highlights a pronounced preference for mobile banking, with a mean score of 1.15. This strongly indicates Generation Z's favouritism towards mobile banking over traditional web-based platforms, a preference further emphasized by a mode of 1, which suggests a significant consensus among respondents for mobile banking. This predilection aligns with insights from the literature review, notably the works of Dorsey and Villa (2020) and Fromm and Read (2018), which underscore the importance of convenience and accessibility in banking for this generation, affirming the critical role of mobile banking in meeting their needs.

Further, the analysis reveals that the average duration of digital banking sessions is brief, with a mean of 1.86 and a mode of 2, illustrating Generation Z's inclination towards quick and efficient banking interactions. This finding correlates with the literature on Generation Z's digital savvy and their preference for speedy transactions, as discussed by Hernandez-de-Menendez, Escobar Díaz, and Morales-Menendez (2020). These authors highlight Gen Z's adeptness at navigating the digital landscape, preferring interactions that are both rapid and fruitful.

The data presents a mean of 2.25 when it comes to adopting new banking technologies, suggesting a cautiously progressive attitude among Generation Z. The mode of 2 and a range of 4 indicate a measured willingness to adopt new technologies, tempered by considerations of reliability and trustworthiness. This mirrors the observations of De Witte (2022) and D'Arco et al. (2023), who note Generation Z's pragmatic approach to innovations and their cautious embrace of new banking technologies, prioritizing security and functionality.

The frequency of digital banking platform usage, with a mean of 1.62, points to moderate engagement levels among Gen Z users, likely indicating regular account monitoring while avoiding excessive app usage. This behaviour is supported by literature, particularly in "Zconomy" by Dorsey and Villa (2020), which reflects Gen Z's efficient engagement with digital services, striving for balance and value in their digital interactions.

Notably high is the confidence in the security of digital banking platforms, underscored by a mean of 4.04 and a mode of 4, revealing a robust trust in digital banking security among Generation Z. This aligns with findings from the "US Banking Digital Trust Benchmark 2022" by Elm (2022), highlighting the paramount importance of security in banking for this demographic.

Lastly, the analysis examines the impact of marketing on digital banking decisions, with a mean of 2.59, indicating a moderate influence. The mode of 2 suggests that, while marketing is considered, it is not the primary determinant of Gen Z's banking choices. This observation aligns with Kotler et al. (2010), who discuss Generation Z's preference for authenticity and personal relevance over traditional marketing tactics.

Digital Banking Preferences of Generation Z

The statistical data underscores a marked predilection within Generation Z for a particular digital banking platform, as indicated by the lean mean of 1.15 and the most common selection, or mode, being 1. This tendency reflects the demographic's alignment with platforms that offer a seamless and integrated user experience, likely favouring the convenience and accessibility associated with mobile banking applications over traditional web-based portals.

The duration of digital banking sessions has a mean of 1.86 and a mode of 2, indicating that most respondents tend to have quick, efficient interactions, possibly for checking account balances or making transactions. Such findings reinforce the importance of designing banking interfaces that facilitate rapid transactions and information retrieval, catering to the generation's demand for efficiency.

Regarding the adoption of new banking technology, the mean score of 2.25 and the mode of 2 highlight a moderately proactive approach to innovation, reflecting a balanced perspective on embracing new banking tools and features. This suggests that while Gen Z is open to innovation, they also value security and reliability in their digital banking experiences.

Confidence in the security of digital banking platforms shows a high mean of 4.04, with a mode of 4. This indicates a strong trust among respondents in the security measures provided by their banks, crucial for the continued use and growth of digital banking within this demographic.

The influence of marketing campaigns on digital banking decisions has a mean of 2.59 and a mode of 2, suggesting that while marketing has some impact, it may not be the primary factor driving Generation Z's banking decisions. Instead, this demographic might prioritize factors like user experience and security over marketing.

Most significantly, the importance of personalized experiences in digital banking is underscored with a mean of 3.89 and a mode of 4. This finding indicates a significant opportunity for financial institutions to leverage data analytics and AI technologies to provide highly personalized banking experiences, aligning with Gen Z's preferences and expectations.

The Role of Social and Ethical Factors

The findings regarding Generation Z's preferences in digital banking illuminate the confluence of social influence and ethical imperatives. The average influence rating of family on digital banking choices stands at 3.48, suggesting a moderate level of familial impact. The mode of 3 indicates a commonality in considering family input, reflecting a collective dimension within personal financial decisions.

Peer influence presents a slightly reduced mean score of 3.16, implying a discerning approach by Gen Z individuals toward friends' advice on digital banking. The mode of 3 for both family and friends' influence corroborates this finding, indicating a balanced assessment of social input rather than a predominant reliance on it.

The role of social media influencers in shaping banking decisions is relatively minimal, as evidenced by a mean score of 2.43 and a mode of 1, highlighting Generation Z's critical stance towards digital endorsements. This observation, in line with Kotler et al.'s (2010) insights, reveals the varying impact of social media across different decision-making contexts, with Generation Z exhibiting a more cautious approach when it comes to financial matters.

Ethical considerations, encapsulated in a bank's environmental and corporate policies, yield a high mean importance rating of 3.90 with a mode of 4. This places ethical banking as a substantial factor in Gen Z's decision-making, echoing the literature's depiction of Gen Z as a socially and environmentally conscious group. The data suggests that ethical considerations may play a more critical role in banking preferences for Gen Z than previously recognized.

These insights highlight the nuanced influences on Generation Z's banking behaviours, illustrating a generation that navigates financial decisions through a lens of ethical values and social considerations. The findings emphasize the lesser impact of social media influencers compared to the direct influence of family and friends and the paramount importance of ethical considerations in their banking choices.

For banks targeting Generation Z, these insights underscore the necessity of developing family-friendly banking solutions and educational initiatives that resonate across generations. Moreover, the findings suggest leveraging peer influence through referral programs and aligning marketing strategies with Generation Z's values, focusing on authentic, value-driven content over traditional influencer marketing.

The minimal impact of social media influencers on banking decisions does not negate the importance of a robust digital presence but encourages banks to focus on authentic, value-driven content. Social media campaigns highlighting ethical practices and community engagement can resonate more deeply with Gen Z, creating an association between the bank's brand and this generation's values.

Notably, the study underscores the significance of environmental and ethical policies to Gen Z consumers, presenting a pivotal opportunity for banks. Committing to sustainable practices, transparent operations, and corporate responsibility can set a bank apart, aligning with Gen Z's preferences for brands that contribute positively to society. Banks that transparently communicate these efforts and integrate them into their product offerings are likely to secure loyalty from this socially conscious generation.

In essence, banks that heed these insights can enhance their appeal to Generation Z and contribute to a more ethical and community-oriented banking landscape. By aligning products and marketing strategies with Gen Z's social and ethical values, banks position themselves to not just win customers but foster long-term relationships with this emerging economic force.

Cultural and Economic Influences

The statistical analysis of the impact of cultural values and economic factors on digital banking preferences among Generation Z in Canada provides significant insights. The data suggests that cultural factors, including language options, currency types, and transaction types, play an important role in shaping this cohort's digital banking experience.

Specifically, the mean scores of 3.27 for language options, 3.51 for currency types, and 3.32 for transaction types indicate that, on average, Generation Z places moderate to high importance on these cultural factors when interacting with digital banking platforms. The median values further substantiate this, particularly the score of 4 for currency types, suggesting most of the respondents find these features to be quite significant in their banking experience. The mode indicates that the most frequent score given by respondents is also in the mid-range, except for currency types, where the mode is 4, denoting a higher concentration of responses at the level of importance.

On the other hand, economic factors such as fees and interest rates demonstrate a high level of importance, with a mean of 3.87 and a median and mode of 4 and 4, respectively. This suggests that while cultural values significantly influence digital banking preferences, economic factors are equally, if not more, critical in Generation Z's decision-making process for digital banking services.

The standard deviations are relatively low across all variables, indicating a general consensus among respondents. However, the range of responses, from a minimum of 1 to a maximum of 5, highlights that within the generational cohort, there is a diversity of opinions and preferences regarding cultural and economic factors in digital banking.

Integrating these findings with literature, these preferences for cultural inclusivity and economic favourability in digital banking resonate with the characteristics of Generation Z as described by Fromm and Read (2018) and Dolot (2018). This demographic's digital nativity and hyper-cognitive nature drive them towards platforms that not only offer technological sophistication but also align with their global consciousness and diverse cultural experiences (Robinson and Schanzel, 2019). Furthermore, their pragmatic approach to financial management and value-seeking behaviour underscores the importance they place on economic factors when choosing banking services (Toit et al., 2023). This aligns with the observations by Witt and Baird (2018), suggesting that digital banking solutions catering to these preferences may have a competitive edge in attracting and retaining Gen Z customers.

In conclusion, for Canadian banks aiming to engage with Generation Z effectively, the emphasis must be on creating a culturally resonant and economically beneficial digital banking environment. This generation's banking choices are not merely influenced by technological innovation but are deeply rooted in cultural relevance and economic pragmatism, pointing towards a future banking landscape that is both culturally sensitive and economically competitive.

Conclusion and Recommendations

Research Objectives Summary and Findings

The primary objectives of this research were to comprehensively explore and analyze the digital banking behaviours, preferences, and trust dynamics of Generation Z in Canada, with a specific focus on individuals born between 1997 and 2001 residing in urban areas. The study aimed to delineate how this demographic interacts with and perceives digital banking platforms, to assess the influence of marketing strategies on their banking decisions, and to understand the impact of social and ethical factors on their banking choices. Another critical objective was to evaluate Gen Z's confidence in the security measures of digital banking platforms and their preference for mobile over traditional web-based banking services. By employing a pragmatic research methodology and utilizing descriptive statistics to analyze data collected through a survey in collaboration with Centiment, this study aimed to bridge the theoretical discourse with practical applications within the banking sector.

Key findings from this thorough analysis revealed several significant insights:

- Preference for Mobile Banking: Gen Z exhibits a pronounced preference for mobile banking platforms, underscoring their role as digital natives who prioritize convenience and accessibility in their banking interactions.
- Confidence in Digital Banking Security: The study also highlighted Gen Z's robust confidence in the security of digital banking platforms, a crucial factor for fostering trust and encouraging the adoption of digital services.
- Moderate Influence of Marketing Strategies: Marketing strategies were found to have a moderate influence on their banking decisions, with a notable preference for personalized and ethical marketing approaches that resonate with their values.
- Impact of Ethical and Social Factors: Additionally, ethical considerations, particularly those related to environmental policies, were significantly important to Gen Z, reflecting their desire for transparency and corporate responsibility from their banking providers.
- Cultural Influences on Banking Preferences: Cultural factors such as language options, currency preferences, and culturally aligned transaction types moderately influence Gen Z's digital banking behaviour. The significant importance placed on multi-currency support reflects their multicultural background and global outlook. Additionally, inclusive language options and adaptable transaction types are crucial for ensuring convenience and personalization, making it imperative for banks to provide diverse linguistic and currency features to engage and retain this demographic effectively.
- Minimal Impact of Social Media Influencers: Lastly, the impact of social influences, primarily from family and friends, was significant, suggesting that personal relationships play a crucial role in shaping their banking choices, unlike the minimal impact of social media influencers.

These findings provide a detailed portrait of Gen Z's preferences and behaviours in the digital banking landscape, offering crucial insights for banks and financial institutions aiming to engage with this key demographic effectively.

Recommendations and Contribution to Practice

Based on the insights garnered from this research, several strategic recommendations are made for the banking industry to effectively engage with Generation Z. Firstly, it is imperative for banks to enhance the user experience on mobile banking platforms, as Gen Z shows a strong preference for mobile access over traditional web-based interfaces. This includes investing in advanced features and ensuring high usability to meet their expectations for convenience and functionality.

Secondly, Gen Z's high confidence in the security of digital banking platforms suggests that banks should not only continue to improve their security measures but also actively communicate these improvements to maintain and build trust. By consistently updating customers about enhancements in their data protection protocols, financial institutions can further strengthen their relationship with this demographic and sustain trust in their digital services.

Finally, considering the significant impact of social circles on banking decisions, banks should consider strategies like referral programs that leverage personal recommendations to capitalize on this influence. Personal relationships play a crucial role in shaping banking choices, and referral programs could capitalize on this influence. Meanwhile, recognizing cultural factors and offering culturally responsive banking services—such as providing language options, supporting multi-currency transactions, and recognizing unique transaction types important to different cultural backgrounds—will ensure that digital banking platforms are inclusive and relevant, enhancing their appeal to Gen Z.

These recommendations, drawn from research findings, will help financial institutions understand and connect with Gen Z's unique needs, helping them design more relevant and effective digital banking services.

Limitations

The study encountered several limitations that could impact the breadth, depth, and broader applicability of its findings. One primary limitation is the reduction in the planned sample size from 385 to 316 participants due to budget constraints, which may limit the generalizability of the results across the broader Gen Z demographic in Canada. Although efforts were made to maintain representativeness, the smaller cohort may reduce the analysis's statistical robustness.

Furthermore, the reliance on a third-party company, Centiment, for the recruitment of participants and initial data analysis introduced a level of dependency that might influence the control over data quality and the methodology employed.

The study's online survey approach might also attract respondents who are more digitally literate or have a particular interest in digital banking, potentially skewing the data towards those who are already engaged with or favourable towards digital banking platforms.

Additionally, the study might not fully capture the cultural and socio-economic diversity within Canada's Generation Z. Economic status, cultural backgrounds, and regional differences can significantly influence banking behaviours, and these factors might not have been adequately represented in the sample.

Moreover, the rapid evolution of technology and changing market conditions could quickly outdate the findings. As new banking technologies emerge and market conditions evolve, the relevance of the data might diminish, highlighting the need for continuous research to keep findings relevant.

Finally, external economic factors such as recessions, job market fluctuations, and changes in government policies related to banking and finance, which were not accounted for in this study, can broadly and suddenly affect consumer behaviour. These complexities underscore the challenges of researching digital banking behaviour and emphasize the necessity for ongoing adjustments and enhancements in future studies to ensure the findings remain accurate and applicable.

Future Research

Considering the rapid evolution of technology and consumer preferences, future research is essential to deepen and broaden the understanding of digital banking behaviours among Generation Z. Longitudinal studies could provide valuable insights into how Gen Z's banking preferences and behaviours evolve as they age and their financial needs change. Expanding the demographic and geographic scope of the research could help uncover regional and cultural differences in digital banking behaviours, providing a more comprehensive understanding of the diverse factors that influence banking choices across Canada.

Furthermore, with the continuous emergence of new technologies such as blockchain and artificial intelligence, future studies should explore Gen Z's adoption rates and attitudes toward these innovations in banking. Additionally, incorporating qualitative research methods could enrich the quantitative findings, offering deeper insights into Gen Z's motivations, attitudes, and perceptions regarding digital banking. This mixed-methods approach would allow for a more nuanced exploration of the complex dynamics that characterize Gen Z's engagement with digital banking services.

In summary, while this research has laid a substantial foundation for understanding Gen Z's preferences in digital banking, ongoing research is crucial to adapt to their evolving needs and to keep pace with technological advancements in the banking sector.

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A Post-Pandemic Critical Evaluation of Remote Working Influences on Affective Well-being, Work-life and Job Satisfaction.

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Abstract

The advent of the Covid-19 pandemic forced many employees to work remotely from home, solidifying the use of digital processes as a normal way of working, and in this post-pandemic world, many employees continue to work from home (Silver, 2023). However, there have been few studies looking into the affective aspects of this new remote/ hybrid working normality. The Affective Events Theory (Weiss and Cropanzano, 1996) has highlighted the importance of affective state in influencing employee job satisfaction and behaviour (Wegge et al., 2006), which is the focus of the current research. Participants were recruited anonymously through social media (N=128) and pseudo-anonymously through an online panel provider sample (N=112). The study implemented a correlational quantitative questionnaire design examining relationships based on the AET framework using questions pertaining to gender, age, children at home, years in job, area where home office is based, and rating of home internet connection alongside questions from pre-existing scales covering social atmosphere, personality dispositions, affective wellbeing, work-life balance, job satisfaction, and job search activities. The descriptive statistics indicate an overall mild impact from isolation and distractions from friends or other media, on average. The standard deviation indicated that some individuals experienced severe isolation and distractions while working from home. Perceptions of positive work inducements in relation to social atmosphere at work since the pandemic averaged around the same as before the pandemic but some rated social atmosphere experiences as lower. The path analysis results of the study indicate that the relationships chosen based on the AET model sufficiently cover the important relationships within the data, providing support for the utility of AET. Most notably, greater levels of isolation linked to poorer social atmosphere and affective well-being, with lower affective well-being linking to lower job satisfaction predicting more job searching behaviours in some cases. Greater emotional *stability lowered work-life imbalances and enhanced affective well-being. It is particularly important for individuals who manage virtual teams to consider the employee impact of remote working affect-related factors and this current study offers guidance on how to implement changes to deal with and alleviate these issues..*

Keywords: Covid-19; New Remote/Hybrid Working Normality; Affective Events Theory; Path Analysis; Isolation; Social Atmosphere; Affective-Wellbeing; Work-Life Imbalance; Job Satisfaction.

Introduction

Even before the advent of the Coronavirus pandemic, virtual teams had already become an integral part of business working culture. Virtual teams (VT's) are comprised of individuals working in a geographically separated space, primarily using Information and Communication Technology (ICT) (Lipnack and Stamps, 1997). Working virtually affords companies the ability to effectively have employees managing projects across disparate geographical locations, which can provide a myriad of benefits. Beneficial factors of this type of work include the ability to incorporate greater diversity of thought and culture, the potential for more effective work and the possibility for an organization to work within more complex and challenging project environments (Bhat, 2017). However, virtual work can also present certain challenges. Difficulties such as a potential lack of collaboration between team members, linguistic and cultural dispersion and feelings of isolation can disrupt effective collaboration (Morrison-Smith and Ruiz, 2020). The compilation of these issues can inhibit team effectiveness significantly, and thus at times, also limit the success of virtual work in comparison to teams working in the same location (Dubey, 2009). Despite this, due to the infusion of technology, and the socio-cultural attitude changes related to virtual work, the use of ICT as a working tool has become a necessity. Furthermore, with the advent of the Covid-19 pandemic, most employees were forced to perform remote work, in effect solidifying the use of digital processes as a normal way of working (Garro-Abarca et al., 2021). Subsequently in this post- pandemic world, many companies have continued to allow employees to telework from home (Silver, 2023). While there has been a plethora of extant literature examining virtual work in the pandemic, there have been few studies looking into the affective aspects of this new normality. This study seeks to examine the impact of social atmosphere and affective well-being in the post-pandemic work environment, using the Affective Events Theory (Weiss and Cropanzano, 1996) as a framework (See Figure 1.), with the aim to provide leaders effective tools to help improve outcomes in a modern and digitally dominated workplace.

Affective Events Theory (AET)

Previous research studies applying the AET (Weiss and Cropanzano, 1996) have highlighted the importance of affective state in influencing employee job satisfaction and behaviour (Wegge et al., 2006). Significant problems can arise on occasions where there is a decline in affective well-being. That is, factors such as work environment features, work events and employee disposition can impact employee affective well-being, and ultimately can have an impact on judgement driven behaviours, work attitudes and affect driven behaviours (Wegge et al., 2006).

Furthermore, verbal promises made by company leaders to employees, which are often reciprocal and can change over time, can also create implicit expectations and thus psychological contracts (Rousseau, 2018). Breaches in such promises can result in increased stress for the employee, which can manifest itself in a myriad of different ways, such as physical and psychological problems and lack of concentration (Cheng, 2021). This can be further exacerbated in the virtual environment, given the limited contact and challenges for the development of trust between leadership and employees (Piccoli and Ives, 2003). Contrarily, when promises are kept, and psychological contracts are honoured, it can result in increased job satisfaction. trust and improved results (Conway and Briner, 2002). The Covid pandemic resulted in many organizations having to make rapid and drastic changes, which may have had a significant impact on employees through breaches of the psychological contract. Furthermore, as the workplace has changed to more hybrid state, and people are becoming more attuned to working outside of the office setting, there is the potential for exacerbation of this issue in the future. Therefore, leaders must consider this impact, as these breaches may not just reduce productivity, but can also impact the affective state of their team members.

Social Atmosphere in the Workplace

One of the challenges of virtual work is the fact that individuals must often work alone, and thus have limited face to face contact with leadership and colleagues. Research has demonstrated the importance of a good social atmosphere within the workplace. Many studies have examined the most effective methods to improve worker morale, productivity, and relationships through managing employee social atmosphere (Daniels et al., 2017). However, working outside of a social atmosphere can contribute to feelings of loneliness and separation from their associated teams, which in turn can negatively impact both the private and working lives of individuals (Erdil and Ertosun, 2011). A component of this phenomenon is related to overall psychological well-being, which can impact the overall mental state of individuals (O'Donnell et al., 2014). When an employee is led with methods promoting positive psychology (PS), such as stimulating achievement, motivation and employee creativity and knowledge, this can result in reduction of employee self-induced stress, and therefore an improved performance and greater individual and organizational results (Kour et al., 2019). Furthermore, positive experiences in teamwork, can elicit similar shared experiences with other members of the team (Walter and Bruch, 2008). Even small, informal conversations in the office environment can enhance collaboration and promote higher job satisfaction (Markum, 2021). However, when working from a home office, implementing PS methods might be more challenging, as people receive less coaching, communicate with fewer colleagues, and have fewer individual meetings with their supervisors (Gibbs et al., 2021). Therefore, the difficulty arises of how to maintain a coherent and collaborative environment in the somewhat isolated working environment of virtual offices. One important aspect of this is the necessity to build trust, and to allow for employee psychological safety, which allows them to freely speak their mind without the fear of negative consequences (Zhang, et al., 2010). When an employee feels that their working environment allows them to speak freely, this can also contribute to practices of greater team sharing and communication (Zhang, et al., 2010).

Job Satisfaction, Work-Life Balance, and Job Turnover

Research has demonstrated a clear correlation between happy employees and productive work, both in the traditional work setting and the virtual environment (Bellet, et al., 2023; Oswald et al., 2015). Employee happiness can be defined as a cognitive and perceptual state in which people feel generally positive about their work (Benuyenah and Pandya, 2020). Affective mood states can also drive important behaviours in the workplace. Many factors can drive affective psychological well-being, including mood, employee contentment, motivational factors, and job security in work (Kundi et al., 2021). These feelings, in turn, can potentially drive behaviour and job satisfaction. Specifically, the pursuit of employee eudaimonic well-being (a focus on purpose or meaning in life) can have a greater impact than hedonic experiences (pleasure) on performance overall (Peiro, 2019). Job satisfaction can be driven by affective intentions and feedback within a current working role or job (Vroom, 1964). A positive attitude towards work would indicate positive job satisfaction. In the presence of positive job satisfaction, employees may have greater organizational commitment and higher motivation (Armstrong, 2006).

A critical question that has arisen during the pandemic is the impact that working remotely and at home has on work-life balance. Some research has demonstrated that teleworking can provide an opportunity for people to achieve greater flexibility in terms of both location and time of work (Coenen and Kok, 2014). However, in some cases, working from home can attribute to the perception of longer working hours, due to the lack of boundaries between an office and home, challenges in concentration due to distractions and greater stress overall (Crosbie and Moore, 2004). Poor work-life balance can result in negative psychological affective health, as well as declining work satisfaction (Gautam and Jain, 2018). Furthermore, lower work-life balance can contribute to a decrease in productivity and impact (Bartlett et al., 2021). Within the virtual workspace, being separated from the organization can create additional challenges related to work-life balance as the office is literally home, and this can also inhibit inclusion in company culture development (Goodman, 2021).

Finally, lower job satisfaction can have an impact not only on work performance, but also result in greater rates of attrition and turnover intention (Medina, 2012). Employees who are under performing in their job roles also tend to have a higher likelihood of quitting, while even good performers have been shown in one study to have a higher intention to quit (ITQ) (Zimmerman and Darnold, 2005). Whereas open communication of organizational change and fulfilment of psychological contract agreements have been shown to be negatively related to turnover intention (van den Heuvel et al., 2017). For organizational leaders, controlling these factors of job satisfaction, trust, employee ITQ and others can prove to be more difficult in the virtual setting. This current AET study seeks to provide a greater understanding of these issues for business leaders considering the new post-covid economy and virtual way of working. The current study examines work environment features, work events, dispositions effects on affective driven behaviours, reactions and work attributes, while also examining affective reactions and work attributes effects on judgement driven behaviours (See Figure 1).

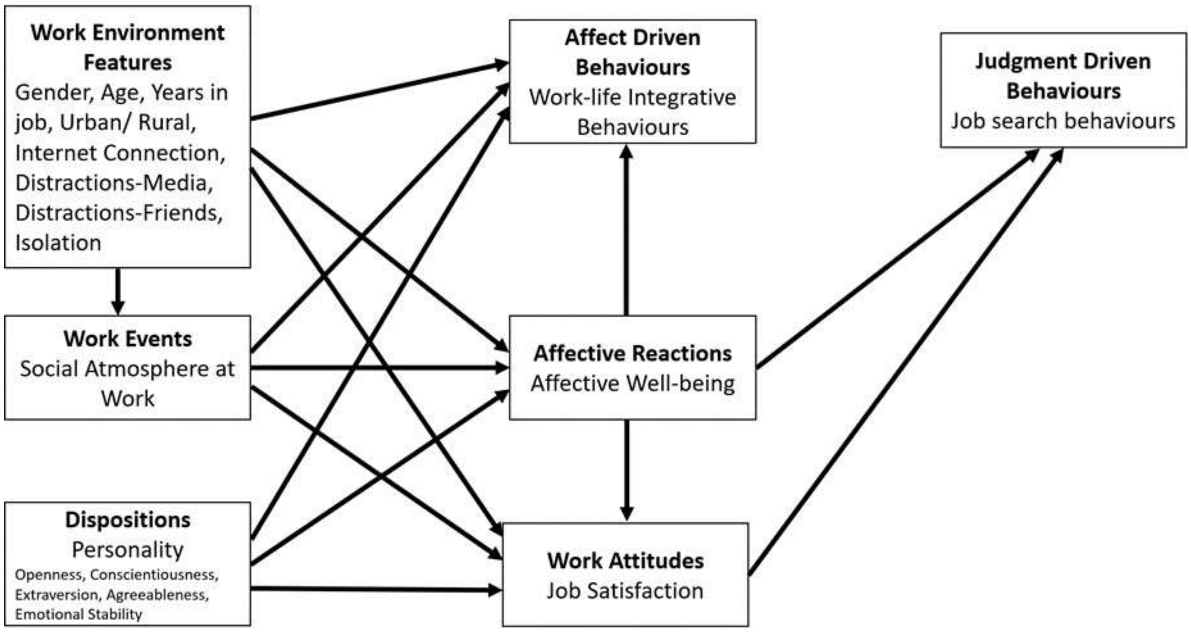

Figure 1. Path analysis model examining Affective Events Theory Relationships

Method

Sample and Procedure

Participants were recruited anonymously through social media (n=128) and pseudo-anonymously through an online panel provider sample (n=112), that had access to participant contact details but no access to survey responses. The panel provided sample were invited to complete the survey for a small monetary incentive. Data collection took place between 21st December 2021 and 22nd February 2022. After removal of incomplete responses and those not working remotely during the COVID-19 pandemic, the final sample size was 205 (Social media n=106; Panel n=99). Table 1 shows most of the sample were female (57.6%), slightly over half the sample were under 40 years old (56.5%), slightly under half had at least one child (45.9%), half the sample been in their job for less than 5 years (50.8%), most were from an urban area of residence (78.0%) and the majority had good to excellent internet connections (85.3%).

Design

The study implemented a correlational design through application of a path analysis model (See Figure 1.) examining relationships based on the Affective Events Theory framework (Weiss and Cropanzano, 1996). The participant selection process involved implementing quota sampling facilitated by an online panel provider and a combination of convenience and snowball sampling via social media. The criterion variables were Judgement Driven Behaviours: Job Search Behaviours and Affect Driven Behaviours: Work-life Integrative Behaviours. Variables playing the dual role of criterion and predictor were Affective Reactions: Affective Well-being, Work Attitudes: Job Satisfaction, and Work Events: Social Atmosphere. The predictor variables were Work Environment Features (Gender, Age, Years in Job, Urban/ Rural, Internet Connection, Distractions-Media, Distractions-Friends and Isolation) and Dispositions (Personality: Openness, Conscientiousness, Extraversion, Agreeableness and Emotional Stability).

Table 1. Sample Demographic Features

Demographic Features	Sample Frequency	Sample Percentage
Gender		
Female	118	57.6%
Male	86	42.0%
Prefer not to say	1	0.5%
Total	**205**	**100.0%**
Age		
18-24 years	12	5.9%
25-29 years	38	18.5%
30-34 years	42	20.5%
35-39 years	24	11.7%
40-44 years	25	12.2%
45-49 years	17	8.3%
50-54 years	19	9.3%
55-59 years	19	9.3%
60-64 years	8	3.9%
65+ years	1	0.5%
Total	**205**	**100.0%**
Children at home		

Yes	94	45.9%
No	111	54.1%
Total	**205**	**100.0%**
Job years		
0-2 years	59	28.8%
3-5 years	45	22.0%
6-8 years	31	15.1%
9-11 years	16	7.8%
12-14 years	9	4.4%
15-17 years	11	5.4%
18-20 years	7	3.4%
21+ years	27	13.2%
Total	**205**	**100.0%**
Area of residence		
Urban	160	78.0%
Rural	45	22.0%
Total	**205**	**100.0%**
Internet connection		
Very poor	2	1.0%
Poor	8	3.9%
Moderate	20	9.8%
Good	103	50.2%
Excellent	72	35.1%
Total	**205**	**100.0%**

Materials

After information about the study inclusion criteria filter and consent-related questions, work environment features were included at the beginning of the questionnaire. These questions pertained to gender, age , children at home, years in job , area where home office is based, and rating of home internet connection. Subsequently, questions from pre-existing scales then covered work events (Social Atmosphere), dispositions (Openness, Conscientiousness, Extraversion, Agreeableness, Emotional Stability), affective reactions (Affective Wellbeing), affect driven behaviours (Work-life Balance), work attitudes (Job Satisfaction), and judgement driven behaviour (Job Search).

Social Atmosphere (Vos, Buyens and Schalk, 2003)
The social atmosphere dimension of the Psychological Contract Content Dimensions Scale (Vos et al., 2003) was used in the current study, with a modified set of response options in relation to statement relating to enforced working from home. Factor analysis and reliability checks in the De Vos et al. (2003) study verify the measure's consistency and accuracy. The possible range of scores for the summed scale is 4-20 based on a 5-point Likert scale, with a higher score indicating higher levels of satisfaction with the positive work-related inducement of social atmosphere.

Dispositions – Ten-Item Personality Inventory (TIPI) (Gosling et al., 2003)

This brief 10-item Likert scale is conducive with use within a study not solely focused on personality, as other scales are required for coverage of other pertinent constructs included within the model framework.. Although not as reliable or valid as longer scales, the TIFI provides adequate convergence with other big-five scales, test-retest reliability, and predictive validity (Gosling et al., 2003). Each set of 2 items consists of a pair of trait options falling within the big five dimensions of openness, consciousness, extraversion, agreeableness and emotional stability. Each item ranged from 1 (Disagree Strongly) to 7 (Agree Strongly), with each dimension possible ranges being 2-14, higher scores indicating greater levels of openness, consciousness, extraversion, agreeableness and emotional stability.

Affective Wellbeing – Ten item version of Daniels measure of affective well-being (Russell and Daniels, 2018)
The original five-factor 30-item Likert scale covered items relating to Anxiety-Comfort (AC), Depression-Pleasure (DP), Bored-Enthusiastic (BE), Tiredness-Vigour (TV), and Angry-Placid (AP), which was then reduced to 10-items, 1 positively and 1 negatively valanced item covering each of the five dimensions. Recommendations from the Harris and Daniels (2005) validation study indicate that reducing the number of factors, even to a single factor, fits best with a summative instruction approach. The current study used the summative instruction approach with the statement 'How did/ do you feel during working from home?', suggesting that a single summative dimension of affective wellbeing is relevant. The possible range of scores for the summed scale is 10-60, with a higher score indicating greater levels of affective wellbeing.

Work-life Balance (Sexton et al., 2016)
The Sexton et al. (2016) Work-life climate Likert scale was used in the current study to assess the work-life balance of the sample. These 8 items relating to work-life balance study were deemed to be a novel and reliable by Sexton et al. (2016). Participants were asked to reflect on the past week and choose between the options: "Rarely or none of the time (less than 1 day)", "Some or a little of the time (1-2 days)", "Occasionally or a moderate amount of time (3-4 days)" or "All the time (5-7 days)". The possible range of scores for the summed scale is 8-32, with a higher score indicating more negative levels of work-life balance or greater work-life imbalance.
Job Satisfaction (Rode, 2004)
The two Likert items measuring job satisfaction in the current study were reported to have good test-retest reliability in the research conducted by Rode (2004). Each item ranged from 1 (Very Dissatisfied) to 5 (Very Satisfied), with the possible range being 2-10, higher scores indicating greater levels of job satisfaction.

Job Search Behaviour (Abubakar, Megeirhi and Shneikat, 2018)
The 10-item job search behaviour Likert scale used in the current study were from Abubakar et al.'s (2018) adoptation of the Blau (1994) measure. A Confirmatory Factor Analysis conducted by Abubakar et al. (2018) provided support for the dimensionality, convergent and discrimant validity for the constructs examined, including Job Search Behaviour. The instruction used at the start of this section of the questionnaire

indicated 'Please read all statements carefully and then select whether or not (yes or no) you exhibited this behaviour while working at home.' Each item ranged from 1 (No) to 2 (Yes), with the possible range being 10-20, higher scores indicating more job searching behaviour.

Results

Table 2. Descriptive Statistics for Path Analysis Model Variables

	Mean	Standard Deviation	Min	Max	Possible Range
Work environment					
Distractions-Media	2.74	1.24	1	5	1-5
Distractions-Friends	2.49	1.19	1	5	1-5
Isolation	2.96	1.33	1	5	1-5
Work Events					
Social Atmosphere	11.68	4.01	4	20	4-20
Dispositions					
Openness	10.08	2.40	3	14	2-14
Conscientiousness	10.94	2.54	4	14	2-14
Extraversion	8.86	2.88	2	14	2-14
Agreeableness	10.24	2.38	2	14	2-14
Emotional Stability	9.81	2.85	2	14	2-14
Affective Reactions					
Affective Wellbeing	42.07	10.31	11	60	10-60
Affect Driven Behaviours					
Work-life Imbalance	14.59	4.82	8	32	8-32
Work Attitudes					
Job Satisfaction	7.53	1.96	2	10	2-10
Judgment Driven Behaviour					
Job Search	13.68	3.70	10	20	10-20

The descriptive statistics indicate mild impact from media (M=2.74) and friends distractions (2.49), on average, for the sample (See Table 2.). Impact from isolation was also at a mild level, on average (M=2.95). Nonetheless, the Standard Deviation and Maximum score statistics suggest that some of the sample had problematically high distraction impacts from media (SD=1.24) and friends (SD=1.19), along with severe isolation (SD=1.33). Perceptions of positive work inducements in relation to social atmosphere at work since the pandemic averaged around the same as before the pandemic (M=11.68) but Standard Deviation (SD=4.01) and Minimum score statistics indicate some of the sample rated their social atmosphere experiences as lower during/ post the pandemic (Min=4). The overall average dispositions of the sample were moderate to moderately high in relation to openness (M=10.08), consciousness (M=10.94), extraversion (M=8.86), agreeableness (M=10.24) and emotional stability (M=9.81). Reported levels of positive affective well-being feelings while working from home ranged between not at all/ a little to very much. When considering the possible range (10-60), average affective well-being levels were moderately high (M=42.07). Work-life imbalance was quite low on average within the sample (M=14.59), but the standard deviation (SD=4.82) and range of scores (Min=8, Max=32) would suggest some sample struggled with work-life imbalances. On average, job satisfaction levels were moderately high (M=7.53), with the standard deviation (SD=1.96) and range of scores (Min=2, Max=10) indicating the presence of lower levels of job satisfaction also. Job searching levels were quite low across the sample (M=13.68), but the standard deviation (SD=3.70) and maximum scores (Max=20) suggest some were more actively seeking new job opportunities.

Table 3. Path Analysis Model Standardized Coefficients and R-Square Values

	Social Atmosphere	Affective Wellbeing	Work-life	Job Satisfaction	Job Search
Work environment					
Gender	.05	-.10*	-.05	.16*	-
Age	-.00	.07	.01	-.15*	-
Child	-.04	.02	-.09	-.06	-
Years in Job	.01	.02	-.01	.00	-
Urban/ Rural	.03	.05	.03	.09	-
Internet Connection	.14	.04	-.14*	-.06	-
Distractions-Media	.07	-.05	-.24**	.05	-
Distractions-Friends	.05	-.03	.18*	-.05	-
Isolation	-.32***	-.56***	.06	.07	-
Work Events					
Social Atmosphere		.13**	.18**	.22**	-
Dispositions					
Openness		.06	.12	.09	-
Conscientiousness		.04	-.00	-.05	-
Extraversion		.00	-.08	.15*	-
Agreeableness		-.06	-.04	.12	-
Emotional Stability		.20***	-.16*	-.05	-
Affective Reactions					
Affective Wellbeing		-	-	.35***	-.17*
Affect Driven Behaviours					
Work-life Imbalance		-	-	-	-
Work Attitudes					
Job Satisfaction		-	-	-	-.15*
Judgment Driven Behaviour					
Job Search		-	-	-	-
Model Summary Statistics					
R-Square	.12**	.63***	.39***	.25***	.07*

**p<.05; **p<.01; ***p<.001*

The path analysis model (See Figure 1 and Table 3) examining Affective Events Theory Relationships showed a good fit to the raw data (χ^2= 35.89 [21, 205], p < .05; CFI = .96; RMSEA = .06), with no modifications required. Significant variance was explained for the outcome variables of social atmosphere (R^2 = .12), affective well-being (R^2 = .63), work-life imbalance (R^2 = .39), job satisfaction (R^2 = .25) and job search (R^2 = .07), most notably with affective well-being having nearly two thirds of its variance explained by model variables. Amongst the relationships examined in the model level of isolation had a significant negative moderate association with social atmosphere (β = -.32, p < .001) and a significant negative strong association with affective well-being (β = -.56, p < .001), suggesting greater levels of isolation linked to poorer social atmosphere and affective well-being. In addition, affective well-being had a significant positive association with job satisfaction (β = .35, p < .001), suggesting greater levels of affective well-being links to better job satisfaction levels.

The rest of the statistically significant associations between variables had weak standardised coefficients below the .30 threshold. These weak significant associations varied from the lowest, β = -.10, p = .035 (gender and affective well- being), to the highest, β = -.24, p = .001 (Distraction-Media and work-life imbalance). Amongst these weak associations, the negative links between internet connection quality (β = -.14, p = .016), distraction from media (β = -.24, p = .001), and emotional stability with work-life imbalance (β = -.16, p = .019) suggest better internet connection and less distraction from friends associate with more work-life imbalance, while emotional stability lessens work-life imbalances, with a positive link between distraction from friends and work-life imbalance (β = .18, p = .015) suggesting more distraction from friends leads to more work-life imbalances. Although still weak in association, lower levels of affective well-being (β = -.17, p = .014) and job satisfaction (β = -.15, p = .031) significantly predict more job searching behaviours. Other weak statistically significant associations, suggest the positive influence of social atmosphere on affective well-being (β = .13, p = .004) and job satisfaction (β = .22, p = .001), but also linking to more work-life imbalance (β = .18, p = .015), while males had greater levels of job satisfaction (β = .16, p = .015) and, conversely, females having greater levels of affective well-being (β = -.10, p = .035), with older individuals reporting lower levels of job satisfaction (β = -.15, p = .044). Finally, significant weak positive associations between the personality dispositions emotional stability and affective well-being (β = .20, p < .001), and extraversion with job satisfaction (β = .15, p = .034), suggest greater levels of emotional stability predict affective well-being while being more extraverted predicts greater job satisfaction.

Discussion

In the post-pandemic society, companies have increased their flexibility in allowing more employees to telework from home (Silver, 2023). A plethora of research suggests that working in virtual teams can bring great benefit to an organization (Bhat, 2017). However, success does not come without challenges and virtual work can also present leaders with great difficulty as well (Morrison-Smith and Ruiz, 2020). This current study sought to uncover the impact of employee affective states on virtual workers with a focused examination of job satisfaction and behavioural factors. The basis of this aspect of the research was Weiss and Cropanzano's work on Affective Events Theory (1996). Furthermore, the current study sought to dig deeper into the impact of social atmosphere, or lack thereof, in virtual work and how working from home can influence positivity in the workplace. As isolation can be an important factor for individuals working from home, it was addressed in the research as well. In addition, the researchers sought to examine how the blend of work-life balance can influence these factors and further contribute to extant literature in this context.

The results of the study indicate that within the sampled cohort (N=205), there was an overall mild impact from isolation and distractions within the home workplace. In the context of this study, distractions were primarily defined as friends or other media. However, the standard deviation of the results indicated that some individuals experienced severe isolation and distractions while working from home. Furthermore, on average, perceptions of positive work inducements in relation to social atmosphere at work since the pandemic averaged around the same as before the pandemic but some rated their social atmosphere experiences as lower. The results also indicate that work-life imbalances were low within the cohort and job satisfaction levels were moderately high and thus overall, job searching levels were rather low. Nonetheless, again, standard deviation and maximum scores suggest that some individuals were actively seeking new work.

The path analysis results suggest that the relationships chosen based on the Affective Events Theory (AET) model (Weiss and Cropanzano, 1996) stipulations sufficiently covered the important relationships within the data, while also explaining significant variation in variable scores, providing support for the utility of AET in this context. Most notably, greater levels of isolation linked to poorer social atmosphere and affective well-being, with lower affective well-being linking to lower job satisfaction predicting more job searching behaviours in some cases. In contrast within some of the weaker relationships in the model, higher levels of emotional stability lowered work-life imbalances and increased affective well-being. Thus, it would be important for organizational leaders of telecommuting/ remote workers to consider the impact of these factors on their employees.

Implications for Virtual Leaders

Through the examination of employee affective states and the implications of working in the virtual environment, this research highlights several important points for leaders of virtual teleworkers. Given the changes in workforce behaviour and the proliferation of virtual work in modern society following the recent global pandemic, there are some critical considerations that should be considered to facilitate the process of improving outcomes and maintain higher affective states for remote employees. To begin with, it is important to consider that while teleworking continues to become more normalized in the modern workplace, challenges can still exist on an individual level. Virtual leaders should not forget that as previous literature has demonstrated and as was further demonstrated in some cases in this research, isolation can still be a problem for some teleworkers (Morrison-Smith and Ruiz, 2020). Thus, virtual leaders should look for opportunities to limit isolation and achieve a binding team environment in which employees come to the realization that they are a part of something greater than themselves and are part of the overall team.

Leaders should also recognize the importance of employee affective states and the idea that positive psychology can impact job satisfaction in employees (Vroom, 1964). They should strive to build trust quickly and maintain their promises throughout the course of the project or span of employment. In this way they can foster greater engagement and positive job satisfaction through continual maintenance of their existing psychological contracts (Conway and Briner, 2002; Rosseau, 2004). Checking in with employees and promoting an environment which contributes to a positive social atmosphere, employee well-being and experiences, are important steps in improving job satisfaction. Content people make better workers, and this should be the appetition of those who strive for better outcomes. (Bellet et al., 2023; Oswald et al., 2015). Thus, by establishing and maintaining employee trust, working to suppress feelings of isolation and following through on promises, virtual leaders can make the new digital way of working more effective and create happier teams in the process.

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A Literature Review: Exploring the Influence of Trust on Knowledge Sharing in Project Teams within Project-based Organisations

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Abstract

The characterisation of knowledge as the primary productive resource of organisations rather than capital, natural resources, or labour, has prompted an increase in the interest of knowledge, however, it is acknowledged that it is in the sharing of knowledge where the value is held. From this perspective, it is conceded that knowledge sharing amongst team members as an intangible asset, has the power to maintain and sustain organisational growth, and survival. Therefore, the factors which enable or inhibit knowledge sharing among team members needs to be identified. Trust has been recognised as a prominent influencing factor on knowledge sharing and it is here where the focus of this literature review lies. This paper offers a review of the literature on knowledge sharing in teams, presenting enabling and inhibiting factors, giving prominence to trust. Trust is investigated to include the role of trust in teams and in knowledge sharing and factors which enables and inhibits the development of trust.

Keywords: Knowledge management, Corporations--Growth, Management,

Introduction

Organisations currently face challenges from volatile economies, rapid technological advancements, and increasingly complex environmental responsibilities. This uncertain and dynamic environment compels organisations to quickly and effectively adapt to survive and thrive (Teece et al., 2016). In this context, Peter Drucker's (1993) research highlights the importance of knowledge as the primary productive resource for organisations, surpassing traditional resources like capital, natural resources, and labour. This recognition has underscored the growing value of knowledge in driving organisational success.

Knowledge is recognised as an essential for creating competitive advantage (Argote and Ingram, 2000; Davenport and Prusak, 2005; Wang et al., 2014; Azeem et al., 2021) and needs to be situated in an environment where it is cared for (Davenport and Prusak, 2005). Hence, understanding how to maximise knowledge will dictate an organisation's capacity for growth and survival (Swart et al., 2014). While knowledge resides within the individual (Grant, 1996), new emphasis has foregrounded the sharing of knowledge of individuals within a team. This enhances the value of knowledge (Yesil, 2019), thereby forming greater knowledge (i.e., collective knowledge) than would otherwise be possible (Kogut and Zander, 1992; Argote and Ingram, 2000; Senge, 2006). Subsequently, the practice of knowledge sharing has become a key focus within organisations as well as academic research (Nonaka, 1994; Asrar-ul-Haq and Anwar 2016; Anwar et al., 2019).

Organisations actively encourage team members to share knowledge, as this practice is crucial for enhancing value and achieving organisational success. Knowledge sharing leads to improvements in team dynamics and project outcomes (Lee et al., 2010; Lee et al., 2015), fosters team innovation (Rahmi and Indarti, 2019), boosts employee creativity (Zeb et al., 2019), and strengthens organisational commitment and learning (Curado and Vieira, 2019; Swift and Hwang, 2013). Additionally, it facilitates effective organisational changes (Park and Kim, 2015) and leverages the collective knowledge of the organisation (Mishra and Bhaskar, 2011), which is closely linked to enhanced overall performance (Mueller, 2014).

In specific organisational sectors and business environments, knowledge sharing is a core aspect of the business structure. Companies in the engineering, procurement, and construction (EPC) sectors tend to adopt project-based structures (Hobday, 2000; Sydow et al., 2004) and rely heavily on knowledge sharing (Ajmal and Koskinen, 2008) given that a the completion of a project task requires more than one skill. Knowledge sharing in project teams is important because it offers insights for future projects (Schindler and Eppler, 2003). In general, each project in project-based organisations (PBOs) is unique in character (Project Management Body of Knowledge, 2021). PBOs must deal with change on a regular basis. In turn, these changes provide a platform for gaining new knowledge through sharing (Terzieva, 2014). Despite the recognized importance of knowledge sharing within PBOs, achieving it can be difficult (Argote and Ingram, 2000; Wittenbaum et al., 2004; Mueller, 2014). This difficulty is due to factors that can hinder the practice of knowledge sharing, which, in turn, may harm organisations by depicting them as inefficient (Rutten et al., 2016). Therefore, understanding the factors which enable and inhibit effective knowledge sharing practices has important implications for the longevity of a PBOs, hence such organisations need to acknowledge such factors.

One particular factor, trust, is regarded as a central factor which influences an individual's decision to share knowledge (Kipkosgei et al., 2020, Rutten et al., 2016). Academic researchers have shown much interest in studying the relationship between trust and knowledge sharing (Asrar-ul-Haq and Anwar 2016; Anwar et al., 2019), this is no doubt partially driven by the evidence of its potential benefits. Trust has been found to increase knowledge sharing among team members (Ma et al., 2008; Rutten et al., 2016), which is attributed to improving organisational performance (Mueller, 2014). Accordingly, this literature review aims to examine trust and how it influences knowledge sharing amongst project team members within PBOs.

The remainder of the paper is structured as follows: It commences with a review of the literature pertaining to the definition of knowledge sharing. It explores the nature of knowledge relevant to knowledge sharing and details the complexities of knowledge sharing. Next, the author moves to the factors that can inhibit or enable the practice of knowledge sharing. Having sifted through the literature the author directs the focus to trust as the central factor influencing the practice of knowledge sharing amongst project team members. Finally, trust is examined as relevant to knowledge sharing in project teams.

Defining Knowledge Sharing

The existing literature includes many different accounts of knowledge sharing (Mc Dermott, 1999; Argote and Ingram, 2000). Knowledge sharing can be characterised as a process controlled by the individual (Swart et al., 2014), which requires the individual's willingness to collaborate with others (Zboralski, 2009). Knowledge sharing is referred to as the act of making knowledge available to others (Ipe, 2003) through the exchange of information, skills, or expertise (Caruso, 2017), and subsequently communicating knowledge (Xue et al., 2011). Knowledge sharing enriches (Davenport and Prusak, 2005) and influences the receiver of the knowledge. Ultimately, it contributes to the development of individual skills, ideas, and expertise (Argote and Ingram, 2000). Similarly, knowledge sharing has been described as a reciprocal process of exchange (Renzl, 2006) or as an activity of transferring or disseminating knowledge from one person, group, or organisation to another (Joshi et al., 2006).

The emphasis of knowledge sharing in organisational teams, was characterised by Srivastava et al. (2006) as a process where team members share task-related ideas, information, and suggestions with each other. This involves integrating new knowledge with existing knowledge that, in turn, redefines existing knowledge (Swart et al., 2014). Knowledge sharing improves team decision making; thus, alternative options based on other team members' experience can be considered (Lee et al., 2010). Lee et al. (2015, p. 3) explained that "members of a team share knowledge with one another when they have access to other team members through which they can garner and integrate knowledge and can anticipate value through sharing". Nonaka (1994) argued that team members play a significant role in the sharing of knowledge. Finally, knowledge sharing has been recognised to foster organisational commitment and learning (Curado and Vieira,2019).

The Nature of Knowledge in Knowledge Sharing

Knowledge sharing requires an understanding of the structure of knowledge. Often the terms knowledge and information are equated and are treated as having the same meaning. Hence, they are used interchangeably (Huber, 1991). However, there are important differences between these terms. Information can be defined as a flow of messages that may take several forms, such as written documents or verbal communications, without any critical evaluation of the messages involved. By contrast, knowledge is information transformed into meaningful and relevant content through analytic modes that are used by individuals as well as groups or teams (Davenport and Prusak, 2005).

Knowledge can be categorised into two types: explicit and tacit (Polanyi, 1966). Explicit knowledge is formal, systematic, and can be easily communicated through data, regulations, policies, manuals, patents, blueprints, reports, and other accessible sources (Maravilhas and Martins, 2019). It involves well-defined information that can be readily shared (Grant, 1996). In contrast, tacit knowledge is intangible, complex, and challenging to share (Jugdev and Wishart, 2014; Maravilhas and Martins, 2019). It is deeply personal and encompasses routines, habits (Adloff et al., 2015), intuitions, and hunches (Maravilhas and Martins, 2019). Tacit knowledge is often tied to individual beliefs, values (Nonaka, 1994; Desouza, 2003), technical skills, and experience (Chugh, 2015), making it subjective and elusive. People often find it difficult to articulate their tacit knowledge, not due to unwillingness but because of its complex nature (Argyris and Schön, 1996). Furthermore, tacit knowledge is context-specific, depending on who is involved and how they engage (von Krogh et al., 2000), as well as being tied to particular times and situations (Nonaka, 1994). It is also dynamic, evolving as it interacts with experiences, insights, and other information, and acquiring unique characteristics over time. Thus, tacit knowledge can be seen as evolving with its environment, almost like a living entity (Davenport and Prusak, 2005).

The focus of this literature review is on knowledge sharing amongst project team members; therefore it is important to consider the enablers and inhibitors of knowledge sharing.

Enablers and Inhibitors of Knowledge Sharing

Sharing knowledge is a fragile and complex process, which is dependent on an understanding of the enablers as well as the potential inhibitors which influence the practice.

Enablers of Knowledge Sharing

Knowledge sharing enablers are factors at the individual, team, and/or organisational level which improve and/or encourage the knowledge holder's willingness to share knowledge. Such factors, if implemented correctly, will significantly contribute to the knowledge sharing process (Cavaliere et al., 2015). Table 1 below summarises the enablers of knowledge sharing identified within the literature.

Table 1: Knowledge Sharing Enablers

Enablers of Knowledge Sharing	Author/Year
Trust	Meyerson et al. (1996), Renzl (2006), Lee et al., (2010), Swift and Hwang (2013), Casimir et al. (2012), Wickramasinghe and Widyaratne (2012), Rosendaal and Biilsma-Frankema (2013), Rutten et al. (2016), Olaisen and Revang (2017), Ouakouak and Ouedraogo (2018), Phung et al. (2019), Zeb et al. (2019), Carmeli et al. (2020)
Team leader attributes	Lee et al. (2010), Xue et al. (2011), Cavaliere et al (2015), Zeb et al. (2019)
Relationships	Swift and Hwang (2013), Olaisen and Revang (2017)
Collaboration	Chen et al. (2014)
Cognitive diversity - different thinking styles	Rahmi and Indarti (2019)
Knowledge heterogeneity - differences in background knowledge	Wu et al. (2015)
Team identification	Rosendaal and Biilsma-Frankema (2013)
Cultural diversity	Bogilović et al. (2017)

While there are a number of enabling factors, trust is recognised as the most significant influence on knowledge sharing and is also important to other factors that impact knowledge sharing (Chen et al., 2014; Asrar-ul-Haq and Anwar, 2016; Ouakouak and Ouedraogo, 2018; Anwar et al., 2019). Empirical research found high levels of trust between co-workers resulted in more knowledge being shared (Rutten et al., 2016; Wickremesinghe and Widyaratne's, 2012) and induced the sharing of knowledge to occur faster (Zeb et al., 2019). According to Rosendaal and Biilsma-Frankema, (2013) trust enables knowledge sharing, particularly when the knowledge sharer trusts the recipients not to exploit the shared knowledge for their individual benefit. Furthermore, within the context of a virtual team, trust influences the practice of knowledge sharing (Olaisen and Revang, 2017). Delving deeper into different types of trust and their influence on knowledge sharing, prior studies draw on McAllister's (1995) two-dimensional model of trust: cognitive-based (based on reason and competence) and affective-based (based on care and concern). Swift and Hwang (2013) found affective-based trust to be the main determinant for knowledge to be shared. These findings are consistent with Casimir et al. 's (2012) research, which found that affective-based trust improves knowledge sharing behaviour as well as performance between colleagues. It is evident from the literature that trust has a significant positive influence on knowledge sharing. Additionally, there are factors which can inhibit the knowledge sharing process therefore, it is necessary to acknowledge such factors.

Inhibitors of Knowledge Sharing

Knowledge sharing inhibitors are factors which restrict or prevent the knowledge holder's willingness to share knowledge and, therefore, may prevent the organisation from reaching its full potential. Table 2 below summarises the main inhibitors of knowledge sharing.

Table 2: Knowledge Sharing Inhibitors

Inhibitors of Knowledge Sharing	Author/Year
Hoarding knowledge: Fear of losing one's unique value Maintaining power and authority Lack of facilitation and motivation	Renzl (2006), Muqadas et al. (2016), Qureshi and Evans (2015)
Poor leadership	Qureshi and Evans (2015), Boies et al. (2015)
Lack of interpersonal trust and Distrust	Connelly et al. (2012), Qureshi and Evans, (2015), Rutten et al. (2016)
Lack of time	Cleveland and Eilis (2015), Qureshi and Evans (2015)
Lack of relationship, competitiveness	Yesil and Hatunoğlu (2019)
Organisational culture	Wei and Miraglia (2017)
Low cultural diversity	Bogilovic (2017)
Lack of communication skills	Cleveland and Eilis (2015)
Technological barriers	Al Attar and Shaalan (2016)

Knowledge hoarding, poor leadership, and lack of trust are among the most prominent factors identified from the literature which inhibit knowledge sharing. Knowledge hoarding is the intentional act of not sharing knowledge for fear of losing one's unique value (Renzl, 2006) and for the purpose of maintaining power and authority (Muqadas et al., 2016). Additionally, knowledge is less likely to be shared among team members when supervised by leaders of a bureaucratic nature than team members engaging with nonsupervisory leaders (Boies et al., 2015).

As previously discussed, trust is an important enabler, therefore it is not surprising that a lack of trust in organisations can impede the process of knowledge sharing (Qureshi and Evans, 2015), while the existence of low levels of trust between co-workers leads to less knowledge sharing (Rutten et al., 2016). Connelly et al. (2012) suggested that distrust between colleagues induces the act of knowledge hiding from which knowledge is not shared. Trust has proven to be the main inhibitor to knowledge being shared (Asrar-ul-Haq and Anwar, 2016).

Therefore, trust is an important factor to consider when examining knowledge sharing amongst project team members. In the next section trust will be examined through: the conceptualisation of trust, the enablers and inhibitors of trust, and the role of trust in knowledge sharing in teams.

The Conceptualisation of Trust

A substantial body of research pertaining to trust using various definitions and structures has been conducted across multiple disciplines, industries, and sectors. Within this, there is some collective consensus relating to the composition of trust (Buvik and Rolfsen, 2015) insofar as trust is recognised as being multifaceted (Mayer et al.,1995; Lewicki and Bunker, 1996; Costa, 2003), involving a dyadic relationship (i.e., the willingness of one party to accept vulnerability), and evolving over a period of time through an individual's repeated positive experience with another (Mayer et al. 1995; Lewicki et al., 1998). Mayer et al. (1995) characterised trust as a risk-taking action reflecting "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" (p. 712). The authors also acknowledged that a team member's assessment of a fellow colleague's (trustee) trustworthiness can be appraised based on three dimensions: integrity, ability, and benevolence. Integrity refers to a set of principles the trustee adheres to, and the trustor finds acceptable. Ability refers to the skill set and competence one displays. Benevolence implies a connection between team members with the understanding that each member wants to do good (Mayer et al., 1995).

Similarly, Lewicki and Bunker (1996) associated the development of trust with the development of a professional working relationship following three sequential stages: calculus-based trust, knowledge-based trust, and identification-based trust. Calculus-based trust is based on the integrity of the team member. Knowledge-based trust is based on familiarity through interactions of team members, which develops over time. This is followed by identification-based trust, which takes place when team members acknowledge that one member can act on behalf of another. Mayer et al. 's (1995) integrity and ability compares with Lewicki and Bunker’s (1996) calculus and knowledge-based trust, which develops early in a working relationship. Also, Mayer et al.’s (1995) benevolence-based trust aligns with Lewicki and Bunker’s (1996) identification-based trust, which takes time to develop and, therefore, occurs at a later stage of a working relationship (Buvik and Rolfsen, 2015). Thus, it can be ascertained that trust develops over time based on an individual’s repeated positive behaviour through professional working relationships (Buvik and Rolfsen, 2015).

Meyerson et al. (1996) asserted that a unique form of trust – that is not behaviour and time dependent – exists within a temporary team environment, where team members still experience the advantage of trust through the development of swift trust. Meyerson and colleagues argued that swift trust has two requirements in order for it to occur: (a) team composition, which consists of limited working history, prospects of working together again, team size, and diverse talent; and (b) team tasking, which consists of complex tasks, that are non-routine, and time bound. Berthold (2015) viewed swift trust as an enabler in developing fast team trust, which develops immediately between interdependent team members who work together but have limited or no prior knowledge or shared experience. Swift trust is an individual’s initial trust perception (Robert et al., 2009) which is developed through a category-based process built on a team members’ characteristics, such as title, expertise, and specialised roles, where individuals subconsciously place team members into a category and assume trust based on that category (Meyerson et al., 1996). Category- based processing develops out of a long-term association predominantly from past experience (Robert et al., 2009).

McLaren and Loosemore’s (2019) research further supports the development of swift trust through category matching where reputation and clear roles have been identified as central to the formation of swift trust within temporary project teams. Swift trust is a presumed form of trust from which team members with restricted encounters must place confidence in other team members' capabilities (Germain, 2011). Additionally, swift trust has been recognised as a necessity to kick start virtual project teams into action (Crisp and Jarvenpaa, 2013) whereby the team members understand that they must trust each other to complete a project (Atkinson et al., 2006) therefore, any uncertainties towards team members must be set aside in order to complete an objective (Germain, 2011). Swift trust is acknowledged as a precipitated trust rather than a gradual development of trust through positive experience (Meyerson et al., 1996), which implies that swift trust is imported. Robert et al. (2009) provided empirical evidence to support category-based processing i.e. swift trust, generates high initial trust perceptions within virtual project teams. Interestingly, Robert et al. (2009) showed that as the team members become more familiar with each other, swift trust can change into knowledge-based (ability, benevolence, and integrity) trust. Pursuing the same line and context of research as Robert et al. (2009) and Zakaria and Yusof (2020) findings suggest the development and depletion of swift trust happens quickly and depending on the correct conditions is replaced by a resilient longer lasting trust.

Enablers and Inhibitors of Trust in a Team

Studies suggest there are a number of enablers of trust. Table 3 below summarises the enablers of trust within a team identified from the literature.

Table 3: **Enablers of trust in teams**

Enablers of Trust	Author/Year
Shared vision	Hsu et al. [JR1] (2011), Rios-Ballesteros and Fuerst, (2022).
Communication	Germain (2011)
Intellectual ability and agreeableness	Naber et al. (2018)
Feedback	Geister et al. (2006)
Prior positive relationships	Buvik and Rolfsen (2015)
Adhering to team rules	Walther and Bunz (2005)
Team diversity	Dayan and Di Benedetto (2010)
Co-operative behaviour	Costa (2003), Naber et al. (2018)
Leadership	Lee et al. (2010), Phung et al. (2019), Islam, et al. (2021), Legood et al. (2020).

Hsu et al., (2011) and Rios-Ballesteros and Fuerst's (2022) research suggests that a shared vision (i.e., common beliefs and values) among team members acts as a strong influencer of trust development. Team communication has been shown to enhance team trust (Germain, 2011). Naber et al. (2018) found that team members with greater intellectual abilities were trusted more than those with lesser intellectual ability. Geister et al. (2006) asserted that exchanging information through team feedback facilitated team trust building. Also, familiarity between team members through prior positive working relationships has been shown to engender trust (Buvik and Rolfsen, 2015). According to Walther and Bunz (2005), adhering to team rules acts as a contributing factor for building team trust. Dayan and Di Benedetto (2010) suggested that demographic diversity in teams (e.g., age, gender, and ethnicity) increases trust among team members. Team members who tend to get along with others in a team, thereby nurturing harmonious team relationships, had a significant positive effect on trust development (Naber et al., 2018). Similarly, Costa's (2003) research found that cooperative behaviour within teams was a strong component of trust. Furthermore, research suggests that leadership practices influence the building of trust in teams (Lee et al., 2010; Legood et al., 2020; Islam et al., 2021).

Inhibitors of Trust in a Team

Similarly, studies suggest there are a number of inhibitors of trust. Table 4 below summarises the inhibitors of trust within a team identified from the literature.

Table 4: Inhibitors of trust in teams

Inhibitors of Trust	Author/Year
Language barrier	Tenzer et al. (2014)
Control systems	Schoorman et al. (2007), Jørgensen and Åsgård (2019)
Communication medium	Hill et al. (2009)
Deep level diversity (attitudes and values)	Pinjani and Palvia (2013)
Intellectual ability, co-operative behaviour	Naber et al. (2018)
Knowledge sharing	Rutten et al. (2016)
Team conflict	Langfred (2007)

Tenzer et al.'s (2014) research suggested that the lack of a common language between team members acts as an inhibitor to the emergence of trust. Schoorman et al. (2007) as well as Jørgensen and Åsgård (2019) asserted that organisations with mechanisms in place to control the progress of work impede trust building. Hill et al. (2009) showed that virtual team introductions display lower levels of trust than face-to-face team introductions. Also, team members displaying low levels of intellectual abilities were trusted less than those displaying higher levels of intellectual ability (Naber et al., 2018). According to Pinjani and Palvia (2013), team member heterogeneity with respect to deep-level diversity (i.e., preferences, attitudes, and values) displays low trust levels. Naber et al. (2018) showed that non-agreeable team members were trusted less than agreeable team members. Furthermore, Rutten et al. (2016) asserted that lower levels of knowledge sharing correlates with lower levels of trust between team members. Additionally, relationship conflict has been shown to lead to less trust between team members (Langfred, 2007).

The Role of Trust in Teams

Trust influences knowledge sharing within teams (Ma et al., 2008; Park and Lee, 2014; Rutten et al., 2016). Additionally, trust among team members contributes positively to the success of the organisation in that trust improves team and task performance (Mach et al., 2010; Boies et al., 2015), team commitment (Sheng and Noe, 2010), and organisational commitment (Curado and Vieira, 2019). Trust has been linked with higher levels of team creativity (Barczak et al., 2010). Moreover, trust in team members and team leaders engenders team identification, from which trust promotes collective (we) as opposed to singular (I) thinking (Rosendaal and Biilsma-Frankema, 2013). Furthermore, trust acts as an important factor towards team climate (Xue et al, 2011). The literature acknowledges trust as an important factor towards the functioning of teams in organisations, but more specifically acknowledges that trust influences knowledge sharing in teams.

The Role of Trust in Knowledge Sharing in Teams

Research pertaining to trust and knowledge sharing among team members suggests that trust has been associated with improving team relations (Hsu et al.,2011) and building cohesion among team members (Zand, 1971; Mach et al., 2010). This tends to enhance team members' willingness to help each other; in turn, knowledge is more likely to be shared (Xue et al., 2011). Rutten et al. (2016) related higher levels of trust in team members with higher levels of knowledge being shared; hence, trust increases knowledge sharing among team members (Ma et al., 2008; Rutten et al., 2016). Therefore, it can be concluded that individuals share knowledge with those whom they trust (Ali et al., 2018). It has been acknowledged that trust is significantly associated with knowledge sharing in teams.

Although there are many studies pertaining to the influence of trust towards knowledge sharing in teams, few studies have examined trust and knowledge sharing within teams that are of a temporary nature; such as project teams. It is within the context of temporary project teams in PBOs where this literature review interests lie.

Project-Based Organisations

Within project-based organisations (PBOs), project team members rely on each other to accomplish a team task within a restricted period (Buvik and Rolfsen, 2015). The interdependent nature of project teams suggests that team members are vulnerable because they rely on other team members to complete the team task. Additionally, when team members work interdependently, knowledge needs to be shared. The literature highlights trust among team members as a prominent factor enabling team knowledge sharing. As previously discussed, trust is acclaimed to be a gradual process that develops over time through prior positive working encounters (experiences) (Mayer et al., 1995; Lewicki and Bunker, 1996). Moreover, trust cannot be created by force (Sheng and Noe, 2010). This poses a challenge for a PBO project team because of its temporary structural nature, which may not allow positive working encounters time to develop, which makes trust difficult to achieve.

The PBO structure differs from other business organisations in that projects are the central unit of production, and the particular project needs to determine the PBO's structure (Hobday, 2000). Often a discipline or skill external to the PBO is needed to complete the project. To source such skillsets, PBOs may liaise with external sources such as recruitment agencies. Once an external source is identified, the PBO may employ that source on a contractual basis for the project's duration. During that time, that contractor becomes a temporary part of the project team. While some team members may have had previous work experience with the contractor, others may not (Buvik and Rolfsen, 2015). In any case, once the project is complete, the team members disperse (Argyris, 1999; Ajmal and Koskinen, 2008; Kitimbo and Dalkir, 2013), and the contract team member leaves. When the team disbands, external team members who have contributed critical inputs to the project leave; thus, knowledge that may be beneficial to future projects cannot be shared (Schindler and Eppler, 2003) by those team members in the future. The temporal and changing nature of project team members in a PBO environment inhibits the development of trusting relationships (Kitimbo and Dalkir, 2013). Thus, relevant knowledge sharing may not take place, which is highly problematic.

Time and previous positive experiences are conditions presumed necessary for trust to develop in teams. The absence of such conditions would suggest low levels of initial trust in project teams, which, in turn, may lead to low levels of knowledge sharing (Rutten et al., 2016). Thus, although PBOs are successful at project performance, evidence suggests that they lack the informal and/or formal practice of sharing experiences and knowledge (Hobday, 2000, Davidavičienė et al., 2020). The literature review indicates a lack of understanding of how trust develops and influences knowledge sharing in project teams within PBOs.

In PBOs where various project team members, with different skills and different backgrounds, interact, an enabling trusting context is difficult to achieve. However, it has been shown that temporary project team members often display high levels of trusting behaviour, almost immediately initiating trust without establishing the acclaimed conditions of time and previous positive experience (Meyerson et al., 1996; McLaren and Loosemore, 2019). However, here lies the puzzle: the conditions that lead to trust — time and previous positive experiences — are required for trust to develop (Mayer et al., 1995; Lewicki and Bunker, 1996). Trust must also pre-exist between project team members for knowledge sharing to occur (Nonaka, 1994;, Zeb et al. 2019). However, the short-term nature of project team members within PBOs makes it difficult to develop trust because trust has not had time to evolve from past working experiences. Therefore, this situation challenges the perceived conventional understanding of how trust is developed (Meyerson et al., 1996). Thus, this literature review contributes to the debate as to whether temporary teams (i.e., project teams) need different processes to build trust.

As discussed, the literature recognises trust as a critical construct that influences the knowledge-sharing process in teams. Additionally, a number of enablers and inhibitors that influence the development of trust have been identified. From the literature it is unclear whether: the development of trust within teams of a temporary nature – project teams – is influenced by the same factors of trust that apply to non-temporary teams.

Conclusion

This paper presents a comprehensive literature review on knowledge sharing within teams, with a specific focus on the role of trust as a critical influencing factor. Despite the wealth of research on knowledge sharing in teams, there is a noticeable gap in the exploration of knowledge sharing dynamics within project teams of a temporary nature. Furthermore, while there is extensive literature on trust development among team members, there is a scarcity of research specifically addressing trust development in project teams within PBOs.

The aim of this literature review is to emphasise the significance of trust development in temporary teams, particularly in project-based teams where knowledge sharing is paramount. Notably, there is a need for more research on swift trust, suggesting that team members in temporary settings may establish trust rapidly. Investigating swift trust can offer valuable insights for practitioners, raising awareness of trust development and its significance in fostering knowledge sharing. This, in turn, contributes to advancing the theoretical understanding of knowledge sharing practices. Further research in this area is essential to enhance our understanding of swift trust and its implications for effective knowledge sharing within temporary teams

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'Desafío Playablanca': An Innovative Educational Experience In The Training Of Secondary Education Teachers

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Abstract

This study, part of the 'Desafío Playablanca' initiative, explores methodological innovation in secondary education teacher training, focusing on gamification and active learning strategies. It addresses the impact of these methodologies on student motivation and academic performance in e-learning environments, a relatively underexplored area. Using a quantitative research design, participants were divided into four groups based on motivation levels—two control and two experimental—to assess the innovative strategies' effects. The study analysed academic performance in oral expression, written expression, visual-spatial, and logical-mathematical skills, using grades collected at the beginning and end of the study and statistical tools such as the Shapiro-Wilk test, Student's T-test, and Wilcoxon test. Findings revealed that the motivated experimental group (Group B) showed significant improvements in all skills, validating the effectiveness of gamified learning. The unmotivated experimental group (Group D) also improved, indicating benefits irrespective of initial motivation levels. Control groups showed no significant changes, underscoring the intervention's positive impact. The 'Desafío Playablanca' project enhances e-learning knowledge by demonstrating that active learning methodologies, like gamification and flipped classrooms, significantly enrich educational experiences, increase engagement and motivation, and improve knowledge assimilation and *application. This research offers a scalable, replicable model adaptable across disciplines, promoting dynamic, interactive, and student-centred learning environments, and supports a shift towards more engaging, participatory, and technologically integrated educational practices.*

Keywords: Gamification; Active learning; E-learning; Motivation and Educational Innovations

Introduction

Methodological innovation within higher education institutions has become indispensable for adapting to the multifaceted challenges and transformations characteristic of the 21st century (Mesa, Campos and Vázquez, 2019). In a world increasingly shaped by globalisation and technological advancements, it is imperative for universities to remain abreast of developments, ensuring they equip students with the requisite tools and competencies to navigate the complexities of the contemporary labour market effectively. Predominantly, methodological innovation entails the adoption of novel teaching and learning strategies that enhance active participation among students, thereby nurturing their critical thinking (Krawczyk and Padilla, 2015) and capacity to address intricate problems (Reyes et al., 2017). Furthermore, it involves the integration of Information and Communication Technologies (ICT) to augment the educational process, facilitating a more interactive and personalised learning experience (Han and Ellis, 2020). Consequently, New Information and Communication Technologies have emerged as pivotal instruments in fostering innovation and creativity, engendering profound modifications across teaching, research, outreach, and institutional governance (Capanegra et al., 2016). Accordingly, these technologies are integral to this proposal, serving as fundamental components of its framework.

Moreover, the motivation of university students is identified as a crucial determinant in fostering such active and meaningful learning (Rodríguez, 2023). A motivated learner demonstrates heightened levels of commitment, interest, and engagement in academic pursuits, which concurrently benefits their individual learning trajectory (Soto Varela et al., 2023). Several factors can influence student motivation, notably including the pursuit of personal and professional aspirations (Gómez-Calderón, García-Borrego and Fernández-Sande, 2019), the perceived relevance of content and associated activities (Aguilar, 2020), and the supportive atmosphere and acknowledgment provided by educators and the educational establishment (Benites, 2020).

In this context, educators assume a pivotal role in stimulating student motivation, tasked with crafting learning strategies that inspire students. This encompasses, inter alia, the presentation of content in a manner that captivates and resonates (Vargas et al., 2019), the setting of clear and achievable objectives (Martín-García, Sánchez-Gómez and Pérez, 2019), the employment of diverse pedagogical methods tailored to the varied learning styles of students (Alvarado, 2019), and the provision of consistent and constructive feedback (Azpilicueta Amorín, 2020).

Additionally, educators are charged with cultivating a learning milieu wherein students feel esteemed. This can be achieved through the creation of participatory and collaborative spaces that encourage the expression of creative ideas and viewpoints (Onofre, 2020), thereby fostering intrinsic motivation (Mesa, Campos and Vázquez, 2019) —a self-derived form of motivation imperative for sustained learning. Consequently, students must also harbour an intrinsic interest in their educational endeavours and commit to their learning journey. The role of educators in motivating students is therefore integral, as they are positioned to offer incentives and rewards that bolster students' own motivational drives (Castro et al., 2020).

Within this framework, the educational innovation proposal herein is formulated, characterised by active teaching and learning strategies that necessitate the direct and proactive involvement of university students in the learning process, as opposed to passive reception of information (López-Gil and Sevillano García, 2020). This project introduces innovative methodologies such as gamification (Cabrera and Pech, 2020), designed to render the learning experience more enjoyable and motivating through the employment of game elements like scores or awards for solving enigmas (Irwanto et al., 2023), or through challenge-based learning (Godínes, 2020), which presents students with real-world problems or challenges requiring research, analysis, and resolution. These methodologies advocate for the application of theoretical knowledge to practical scenarios, and promote teamwork, collaboration, and communication—skills indispensable for the professional development of future educators (Araneda et al., 2023). Furthermore, the flipped classroom methodology (Diningrant et al., 2023) is incorporated, inverting the traditional educational model by pre-assigning digital materials for study, thus allocating class time to discussion, problem-solving, and topic exploration. Storytelling (Moore, 2023) is also integrated as a central theme, enveloping these methodologies in a narrative technique designed to effectively transmit information, impart knowledge, and connect with student motivation.

This paper proposes an innovative framework characterised by teaching and learning strategies within the university context that promote the active engagement of students, aiming to foster active learning through the cultivation of critical thinking and problem-solving abilities —crucial for the personal and professional advancement of university students.

Based on the aforementioned, this proposal aims mainly to show the conceptualization of an educational initiative and the results derived from its implementation. It aims to demonstrate that its application precipitates an enhanced motivation for learning amongst students enrolled in the master’s degree in Teacher Training for Secondary Education, delivered online, particularly within the subject of Educational Innovation.

In Spain, the master's degree in Teacher Training for Secondary Education is the compulsory training that must be completed in order to become a secondary education teacher, according to Organic Law 2/2006, of May 3rd, on Education (LOE), later amended by Organic Law 8/2013, of December 9th, for the improvement of educational quality (LOMCE). Specifically, Article 100.2 of the LOE states that in order to access the teaching profession at secondary education, high school, and vocational training levels, it is necessary to have adequate pedagogical and didactic training. This master's degree qualifies graduates to work as teachers in these educational stages in Spain.

The objectives outlined are as follows:

1. To devise a methodological innovation proposal necessitating the application of theoretical knowledge acquired by students.

2. To enable learners to engage with active teaching-learning methodologies and strategies.

3. To facilitate the practice of novel methodologies such as gamification, challenge-based learning, flipped classroom, and storytelling.

4. To execute a quantitative and comparative analysis of outcomes following the application of the proposed framework to an experimental cohort.

Methodology

Description of the Educational Proposition

At the heart of the pioneering pedagogical proposition 'Desafío Playablanca' lies a targeted initiative for participants of the master's degree in Secondary Education Teaching, with a particular emphasis on the Vocational Training and Career Guidance specialisation. This scheme emerges as a visionary endeavour aspiring to transform the educational process through the adoption of gamified strategies, thereby leveraging the motivation and commitment of students within a virtual learning setting. The methodological and didactic blueprint of 'Desafío Playablanca' signifies a departure from conventional teacher training modalities, incorporating active learning methodologies and gamification elements into the curriculum. Such a fundamental overhaul is predicated on the belief that a course centred on Teaching Innovation should epitomise innovation itself.

In the era of digitalization, the task of capturing and retaining student engagement has become increasingly formidable. In response, 'Desafío Playablanca' proposes a gamified educational experience that amalgamates diverse methodologies and pedagogical resources, thereby infusing the instructional environment with a refreshing and compelling perspective for prospective secondary education teachers.

The structure of 'Desafío Playablanca' is delineated through a sequential learning journey spanning the duration of the course, wherein each session introduces a novel challenge predicated on active engagement. Herein, students take centre stage in their educational journey, engaging either individually or collaboratively to surmount challenges that necessitate a holistic application of knowledge.

The project narrative is centred around the fictive reconstruction of Playablanca, a quaint coastal township devastated by a natural calamity. Occupying the roles of educators in training, students are tasked with navigating a series of pedagogical and societal quandaries to aid in the community's resurgence. This storyline provides a profound and motivating backdrop, facilitating the seamless assimilation of the curriculum's content.

Figure 1: Screenshot from the site containing the experience.

The instructional model deployed endorses the flipped classroom approach, enabling students to undertake preparatory work in advance and allocating classroom time for dynamic engagement and problem resolution. Gamification stands as a cornerstone of this initiative, with a structured system of points and rankings designed to foster participation and sustained effort.

Procedure

The cohort involved in this experimental study comprised university students. Presented in Table 1 are the demographics for the four scrutinised groups, inclusive of two control groups and two experimental groups, each distinguished by their motivational predisposition. The composition of students in each group is comparable, as is the presence of repeating students across both the motivated and unmotivated groups.

Table 1: Groups Definition

Group	Type	Characteristics	N	Repeaters
A	Control	Motivated	53	0
B	Experimental	Motivated	51	0
C	Control	Unmotivated	56	17
D	Experimental	Unmotivated	48	13

Four groups were established, each containing a roughly equivalent number of participants. To monitor the pre-existing levels of motivation, the study delineated two control groups and two experimental groups. Additionally, to minimise potential bias resulting from the status of the students, the proportion of repeating students across both motivated and unmotivated groups was equilibrated.

The control groups, labelled Control 1 and Control 2, functioned as the comparative baseline against the experimental groups. These participants did not undergo any specific intervention aimed at influencing their motivational states.

Conversely, the experimental groups, named Experimental 1 and Experimental 2, constituted the focus of the motivational intervention under scrutiny. Each of these groups partook in the identical intervention, thereby facilitating the evaluation of the intervention's efficacy. To further investigate the potential interplay between the level of motivation and the efficacy of the intervention, participants were stratified according to their self-reported motivational levels before being assigned to groups. This stratification process resulted in the formation of an Experimental 1 group, composed of students with naturally higher levels of motivation, and an Experimental 2 group, consisting of students with naturally lower levels of motivation. Equalising the number of repeating students across these motivational categories was instrumental in ensuring that any effects observed could not be attributed solely to previous student experiences.

Employing a balanced, multi-group design encompassing both control and experimental conditions enabled the study to isolate the effects of the motivational intervention, controlling for inherent motivational disparities and the status of the students.

Regarding data collection, this investigation assessed academic performance by evaluating four key skills: oral expression, written expression, visual-spatial, and logical-mathematical abilities. Owing to the structured nature of the course, discrete grade values were recorded at two pivotal junctures: at the commencement of the course (initial measurement) and upon the term's conclusion (final measurement).

The statistical analysis was executed as follows: initially, a fundamental examination of means and standard deviations for each skill at both evaluation intervals and across all groups was conducted using the Microsoft Excel software. Subsequently, the open-access software JASP, version 0.17.2.0, was utilised to perform an inferential statistical analysis. Within this analysis, the initial assessment was treated as the pretest, with the concluding evaluation acting as the post-test. The aim of this analytical phase was to determine the presence of statistically significant differences between the initial and final evaluations, thereby appraising the pedagogical experience. To this end, the Shapiro-Wilk normality test was employed to assess the hypothesis of normality between evaluations for each skill. In instances where the p-value was found to be less than 0.05, the Wilcoxon test was applied to confirm significance, reaffirming the threshold of $p = 0.05$ as the conventional criterion for establishing statistically significant differences, whilst also observing the corresponding correlation coefficients. Should the p-values exceed 0.05 in the normality test, indicating an absence of significant differences, the analysis proceeded with the student’s t-test, employing a threshold whereby differences were deemed non-significant if p exceeded 0.05. Furthermore, the study was enhanced with the computation of Cohen's d to determine the effect size.

Results

The orchestration of the teaching practice for groups A, B, C, and D was conducted in accordance with the procedures outlined in the methodology section. This involved the acquisition of students' grades at two distinct junctures—the commencement and the conclusion of the period, denoted as the initial (i) and final (f) evaluations, respectively. These assessments spanned four key competencies: oral expression, written expression, visual-spatial (V-S), and logical-mathematical (L-M) abilities. Table 2 provides an initial statistical analysis, incorporating both the mean scores and standard deviations, succeeded by the descriptive statistics pertinent to the four groups under scrutiny.

Table 2: Mean Scores and Standard Deviations by Group and Time of Evaluation

Group	Parameter	Evaluation	Oral expression	Written expression	V-S	L-M
A	Mean	i	5.4	6.7	6.7	6.1
		f	5.3	6.3	6.5	6.3
	Standard deviation	i	1.8	1.6	1.7	1.8
		f	2.8	2.3	1.7	2.0
B	Mean	i	5.1	6.3	6.4	5.3
		f	5.7	7.0	6.9	5.9

	Standard deviation	i	1.7	1.5	1.7	1.7
		f	2.0	1.4	1.7	1.5
C	Mean	i	3.1	4.2	4.2	4.0
		f	3.7	3.6	4.9	4.4
	Standard deviation	i	1.8	2.1	2.2	1.8
		f	3.1	2.3	3.0	2.0
D	Mean	i	2.8	4.1	4.6	4.5
		f	3.9	4.8	5.3	5.2
	Standard deviation	i	1.7	1.5	1.7	1.4
		f	2.4	1.9	2.3	2.1

Primarily, regarding Group A, which serves as the motivated control group, it is pertinent to note that the mean grades exhibit minimal variance, with the spread of scores ranging from 1.7 to 2.8 points across both evaluation instances and irrespective of the skill assessed.

Additionally, for this group, the Shapiro-Wilk normality test results, delineated in table 3, reveal that all p-values exceed 0.05. This suggests that the observed differences lack statistical significance.

Table 3: Shapiro-Wilk Normality Test for Group A

Pretest	Test	W	p
Oral expression i	Oral expression f	0.961	0.081
Written expression i	Written expression f	0.963	0.098
V-S i	V-S f	0.975	0.317
L-M i	L-M f	0.967	0.148

Table 4 illustrates the outcomes of the Student's T-test conducted for this group, with all p-values surpassing 0.05, thereby substantiating the assumption of distribution normality. Furthermore, the application of an effect size correction, as indicated by the low Cohen's d values, reinforces the findings.

Table 4: Student's T-Test and Results of Effect Correction for Group A

Pretest	Test	t	df	p	Cohen's d
Oral expression i	Oral expression f	0.467	52	0.642	0.064
Written expression i	Written expression f	1.416	52	0.163	0.194
V-S i	V-S f	0.753	52	0.455	0.103
L-M i	L-M f	-1.127	52	0.265	-0.155

For group B, identified as the motivated experimental group, table 2 demonstrates an incremental improvement in the average grades towards the semester's end, with increases ranging from 0.5 to 0.7 points, while the variability of scores spans from 1.4 to 2.0 points across both evaluations and all assessed skills.

Additionally, table 5 displays the results of the normality test for this group, showcasing a notable deviation from the control group. The observed distributions deviate from normality, as evidenced by p-values not surpassing the 0.05 threshold.

Consequently, the Wilcoxon test, detailed in table 6, affirms the significance of these outcomes ($p < 0.05$), accompanied by robust correlation coefficients, as indicated by R^2 values ranging between 0.715 and 0.969.

Table 5: Shapiro-Wilk Normality Test for Group B

Pretest	**Test**	**W**	**p**
Oral expression i	Oral expression f	0.943	0.017
Written expression i	Written expression f	0.912	0.001
V-S i	V-S f	0.928	0.004
L-M i	L-M f	0.928	0.004

Table 6: Wilcoxon test for group B

Pretest	**Test**	**W**	**z**	**p**	**R^2**
Oral expression i	Oral expression f	373.500	-2.377	0.017	-0.390
Written expression i	Written expression f	270.500	-3.402	< 0.001	-0.558
V-S i	V-S f	301.500	-3.094	0.002	-0.508
L-M i	L-M f	344.500	-2.497	0.013	-0.414

Upon examination of the outcomes, it has been statistically validated that significant modifications occur within the four competencies related to the pedagogical methodology examined in this investigation, particularly among the groups characterised by high motivation.

When delving into the data for the two groups with elevated levels of motivation, attention turns to group C, designated as the unmotivated control group. According to table 2, there appears to be a marginal improvement (approximately 0.5 points) in three of the four competencies assessed, with written expression being the notable outlier. The range of dispersion for this group is identified to be between 2.0 and 3.1.

Conversely, the analysis delineated in table 7 reveals the absence of statistically significant differences between the initial and final evaluations across all skills and assessment intervals.

Table 7: Shapiro-Wilk Normality Test for Group C

Pretest	Test	W	p
Oral expression i	Oral expression f	0.968	0.146
Written expression i	Written expression f	0.976	0.339
V-S i	V-S f	0.979	0.443
L-M i	L-M f	0.961	0.070

Utilising the student's t-test reveals that the p-values exceed 0.05 in every instance, thereby confirming the normality of grade distributions across all evaluated scenarios.

Table 8: Student's T-Test and Results of Effect Correction for Group C

Pretest	Test	t	df	p	Cohen's d
Oral expression i	Oral expression f	-1.673	55	0.100	-0.224
Written expression i	Written expression f	1.629	55	0.109	0.218
V-S i	V-S f	-1.682	55	0.098	-0.225
L-M i	L-M f	-1.340	55	0.186	-0.179

In the case of group D, identified as the unmotivated experimental group, table 2 shows a significant enhancement in the mean scores across all four skills, with oral expression experiencing the most substantial increase (up to 1.1 points). The spread of scores is consistent with the other groups, ranging from 1.4 to 2.4.

Furthermore, Table 9 presents the Shapiro-Wilk normality test results, which, like Group B, reveal that the p-values fall below the 0.05 threshold. Consequently, the Wilcoxon test, detailed in Table 10, confirms the significance of these findings ($p < 0.05$), accompanied by robust correlation coefficients.

Table 9: Shapiro-Wilk Normality Test for Group D

Pretest	Test	W	p
Oral expression i	Oral expression f	0.939	0.015
Written expression i	Written expression f	0.923	0.004
V-S i	V-S f	0.949	0.035
L-M i	L-M f	0.924	0.004

Table 10: Wilcoxon test for group D

Pretest	Test	W	z	p	R^2
Oral expression i	Oral expression f	187.000	-4.113	< 0.001	-0.682
Written expression i	Written expression f	221.500	-3.341	< 0.001	-0.572
V-S i	V-S f	292.000	-2.715	0.007	-0.460
L-M i	L-M f	301.000	-2.617	0.009	-0.443

These findings underscore the considerable influence that effective teaching methodologies can exert on student outcomes within the context of higher education, even amongst cohorts characterised by lower levels of motivation. The results are subsequently examined in a disaggregated manner to elucidate this impact further.

In the case of group A, the motivated control group, the data reveal an absence of statistically significant variations in academic performance skills between the initial and final assessments. The Shapiro-Wilk normality test corroborated that the score distributions did not significantly diverge, implying that the pedagogical approach adopted for this cohort did not result in marked enhancements in academic performance competencies.

In contrast, group B, the motivated experimental group, displayed modest increments in the average scores across the assessed competencies. The Shapiro-Wilk test outcomes suggested that the score distributions deviated from normality, and subsequent analysis via the Wilcoxon test validated the presence of significant improvements in academic performance following the intervention. This indicates that the pedagogical strategy implemented for group B positively influenced academic outcomes.

Turning attention to group C, the demotivated control group, a marginal elevation in average scores was observed for three of the four competencies evaluated. The Shapiro-Wilk test confirmed that the distributions conformed to normality, and the student's t-test upheld the absence of significant differences in academic performance between the pre-test and post-test phases. This suggests that the instructional method employed did not significantly affect academic performance within this demotivated cohort.

Lastly, group D, the demotivated experimental group, demonstrated pronounced improvements in mean scores across all evaluated competencies. The Shapiro-Wilk test identified non-normal distributions, prompting the application of the Wilcoxon test, which affirmed significant enhancements in academic performance following the intervention. This reveals that the instructional approach enacted for group D had a markedly positive impact on academic outcomes, notwithstanding the initial motivational deficit.

In summary, these outcomes accentuate the pivotal role of teaching methodologies in shaping academic performance, including among groups presenting lower motivation levels. The evidence highlights the necessity for bespoke educational strategies to optimise student achievements and points to the potential of instructional interventions to effect positive changes in student performance within university environments. Further investigative efforts in this domain hold promise for uncovering efficacious teaching practices suited to the diverse needs of student populations.

Analysis and Discussion

'Desafío Playablanca' articulates a pedagogical proposal rooted in the principle of experiential learning, advocating for an educational experience that immerses students in the direct application of knowledge. This method underscores the value of experimentation and learning from mistakes, enriching students' comprehension of theoretical principles and their relevance to practical scenarios. Such an approach empowers students to discern the inherent logic within educational processes, markedly improving their capacity to amalgamate theoretical insights with practical application.

Active learning methodologies in higher education, such as flipped learning and gamification, are key in improving educational outcomes by fostering motivation, autonomy, and student engagement (Parra-González et al., 2020).

The findings of this study confirm the effectiveness of the innovative methodologies applied in "Desafío Playablanca," particularly in the experimental groups. Data analysis through parametric and non-parametric tests showed significant improvements, especially in the experimental groups. Specifically, group B (motivated experimental group), showed substantial progress in all four assessed skills (oral expression, written expression, visual-spatial, and logical-mathematical). These results are consistent with previous studies on active methodologies in higher education, which argue that these approaches foster autonomy, motivation, and improved academic outcomes (Parra-

González et al., 2020; Manzano-León et al., 2022). Additionally, they facilitate active learning and the cultivation of key competencies, including digital literacy, which commands a premium in today's digital-centric society (Arruabarrena et al., 2019).

Gamification, as a core element of these strategies, creates an engaging and motivational environment by integrating game elements into educational contexts. This approach drives higher student participation and fosters critical thinking and creativity through real-world challenges, pushing students to apply theoretical knowledge in practical scenarios.

The flipped classroom model, which also constitutes a key component of this methodological framework, further enhances this dynamic by shifting traditional learning paradigms. In this setup, students prepare ahead of class, allowing for more interactive, problem-solving sessions during class time. This not only optimizes learning outcomes but also strengthens collaborative and practical skills (Moreno-Guerrero et al., 2021). While beneficial, this model occasionally faces challenges, such as a mismatch between institutional goals and family engagement (Bond, 2019).

Critical reflection on encountered obstacles is deemed essential within the learning trajectory. Utilising collaborative technologies like Jamboard enhances the collective sharing of experiences, methodologies, and resolutions identified by students. This collaborative exercise not only bolsters individual learning through idea exchange but also advances the social and cooperative skills indispensable for educators in modern educational contexts. Kim et al. (2011) argue that facilitating deep learning through collective reflection is vital in project-based learning environments, with effective instructor guidance being paramount to optimising group performance.

In Group D (unmotivated experimental group), the results were equally notable, with significant improvements in all assessed competencies. This suggests that active methodologies are effective even for students with initially low motivation. The improvement in this group confirms that gamification and active learning can also serve as a catalyst for engagement in students who otherwise may struggle to stay motivated.

In contrast, the control groups (A and C), which did not receive any active learning interventions, showed no significant changes in academic performance. This underscores the limited effectiveness of traditional, passive learning methods in improving student outcomes, even among those with initial motivation. These findings suggest that motivation alone is not enough to foster academic improvement without the support of dynamic and student-centered approaches like those developed in 'Desafío Playablanca'.

The improvements observed in both motivated and unmotivated experimental groups (B and D) highlight the capacity of active learning strategies to enhance intrinsic motivation and academic performance. The application of real-world challenges in

"Desafío Playablanca" allowed students to engage more deeply with the material, leading to better development of critical skills, such as oral and written expression.

In conclusion, the results of "Desafío Playablanca" demonstrate that integrating active learning methodologies, such as gamification, flipped classroom, and storytelling, can significantly enhance academic performance. The statistical validation of these results, particularly in the experimental groups, highlights the importance of adopting innovative, student-centered approaches to foster deeper learning, motivation, and skill development in higher education.

Conclusions and Recommendations

'Desafío Playablanca', as an innovative educational initiative, not only echoes the pressing need for methodological innovation in the pedagogical landscape but also underscores its tangible benefits on learning outcomes and student motivation. The initiative's core, built on gamification, challenge-based learning, flipped classrooms, and storytelling, serves to revitalise the educational experience, rendering it more engaging and pertinent to the demands of the contemporary educational milieu.The comparative analysis undertaken between control and experimental groups, stratified by their motivational levels, unveils significant insights into the efficacy of 'Desafío Playablanca'. The findings from this empirical investigation suggest a notable enhancement in the academic performance and motivation of students who engaged with the active learning strategies embedded within the initiative. Particularly striking are the improvements recorded among students initially categorised with low motivation levels, who, through their participation in 'Desafío Playablanca', exhibited significant strides in oral expression, written expression, visual-spatial, and logical-mathematical skills. This improvement not only attests to the potency of the employed methodologies in fostering academic excellence but also in catalyzing a motivational shift amongst learners.

'Desafío Playablanca' epitomises the transformative potential of active learning methodologies. By shifting the locus of learning from a passive reception of knowledge to an active engagement with content, these methodologies promote a deeper, more holistic understanding of subject matter. Furthermore, the integration of ICTs and gamification strategies enriches the learning environment, making it more interactive and immersive. This aligns with the pedagogical prerogative of fostering an educational setting that is not only intellectually stimulating but also emotionally engaging, thereby enhancing students' intrinsic motivation towards learning.

Moreover, the significant outcomes observed in the experimental groups underscore the efficacy of these methodologies in bridging the gap between theoretical knowledge and practical application. Through the practical challenges and collaborative tasks inherent in 'Desafío Playablanca', students were afforded the opportunity to apply theoretical concepts in solving real-world problems. This not only facilitated a deeper engagement with the content but also honed critical thinking and problem-solving skills, competencies that are invaluable in the modern educational and professional landscape.

In synthesising these findings, 'Desafío Playablanca' tries to offer a blueprint for the future of teacher education. By embedding active learning methodologies at the heart of teacher training, the initiative not only enhances academic performance and motivation but also prepares future educators to navigate and thrive in the evolving educational landscape. The success of this initiative serves as a testament to the potential of innovative pedagogical approaches in transforming educational experiences and outcomes.

In conclusion, the 'Desafío Playablanca' experience underlines the critical role of active methodologies in contemporary teacher education. The initiative's positive impact on student motivation and academic performance illuminates the path forward for educational innovation. It calls for a paradigm shift in teacher training, urging the adoption of pedagogical strategies that are dynamic, participatory, and aligned with the needs of the 21st-century learner. As the educational landscape continues to evolve, initiatives like 'Desafío Playablanca' offer valuable insights and frameworks for enriching the educational journey of future teachers, thereby contributing to the cultivation of a more engaged, motivated, and competent generation of educators.

*This study does not require ethical approval as it does not process any personal data from any individual.

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Mapping the Growth of Workplace Mindfulness Research for Work-Related Stress: A Bibliometric Analysis of Trends, Key Authors, and Leading Institutions (2004-2024)

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Abstract

Objective: *This paper investigates the existing scholarly literature on mindfulness-based programs implemented within organisations to address work-related stress. It seeks to offer a thorough understanding of the research landscape by analysing publication trends, citation patterns, and prominent research institutions. The paper also discusses the top 10 globally cited documents.*

Methods: *Bibliometric analysis was conducted using the Web of Science (WOS) database. A robust search string was developed, incorporating keywords related to mindfulness practices and work-related stress. Inclusion and exclusion criteria were established. Publication data, authorship information, and keywords were extracted from the retrieved articles.*

Results: *1092 documents published between 01st January 2004 to 14th June 2024 were retrieved from the WOS database. The results were imported to Biblioshiny, a tool to analyse and visualise bibliographic data. The result revealed that the annual growth rate of research on the topic is 19.28%. Mindfulness Journal is the most locally cited source, with 2159 local citations. Monash University of Australia tops the list of most relevant affiliations. The United States of America is the country with the highest number of scientific productions, corresponding authors, and documents with the highest citations.*

Conclusion*: The number of publications on mindfulness in workplaces has grown. However, more research articles in Business and Management journals that combine* *mindfulness, stress and organisations are necessary to comprehend the diverse aspects and precursors of mindfulness practice in workplaces.*

Keywords: Mindfulness, Job Stress, Organisations, Bibliometric Analysis, Bibliometrics

Introduction

The modern 24-hour economy is characterised by a fast-paced lifestyle, tight schedules, intense competition, job instability, continuous connectivity through advanced telecommunications, a flood of stimuli, and the requirement to juggle multiple roles simultaneously (Stansfeld and Candy, 2006). Feeling tense, restless, urgent, or overwhelmed from daily stress is common in Western society (De Bruin et al., 2017). Most people dedicate the majority of their active hours to work. Consequently, 22% of the workforce in the European Union (EU) experiences Work-Related Stress (WRS) that greatly affects their well-being (EU-OSHA, 2015). Stress in organisations is defined as the mismatch between an individual's skills and abilities and the demands of their job, as well as the disparity between a person's needs and what the job environment provides (French, Rodgers and Cobb, 1974). WRS is explained as an adverse response that individuals experience due to excessive pressures and demands at work (Bhui et al., 2016).

There are personal and economic costs associated with stress (Kersemaekers et al., 2018). In the workplace, stress can lead to decreased productivity, absenteeism, accidents, poor judgment, and increased malicious gossip and errors (Israni, 2022; Kalia, 2002). Employers are increasingly concerned about WRS as they face higher risks of legal liability for damages to stressed employees (Midgley, 1997; Rees, 1997). The International Social Security Association (ISSA) reports that returns on investments in workplace health and safety are more than double the invested amount (ISSA, 2013). These insights encourage modern companies to prioritise employee well-being (Dóra et al., 2019). Both academia and management are showing increased interest in employee well-being within organisations (Zheng et al., 2015). It is vital for the survival and growth of organisations globally, thereby emerging as a key research topic in organisational behaviour and related fields (Spreitzer and Porath, 2012). Furthermore, employee well-being is a key concern for research and practice, with a widespread acknowledgement that psychologically healthy employees are more productive and less likely to leave their jobs (Wright and Huang, 2012). Organisational managers are exploring new approaches like mindfulness to help employees tackle modern occupational challenges (Mack et al., 2015; Reb and Choi, 2014). The increasing awareness of mindfulness benefits has led to a surge in its popularity across various settings, including organisations (Sutcliffe, Vogus and Dane, 2016).

Mindfulness, which originated in the context of Buddhism around the 5th century BCE, gained prominence in the West through Kabat-Zinn (1982), who developed a Mindfulness-Based Stress Reduction (MBSR) programme for chronic pain (Lomas et al., 2019). Mindfulness is a conscious state of being non-judgmentally aware of and attentive to current experiences (Bishop et al., 2004; Brown and Ryan, 2003). The most commonly used definition of mindfulness is, “the awareness that arises from paying attention in a particular way, on purpose, in the present moment, and non-judgmentally” (Kabat-Zinn, 1994, p. 14).

Within the last decade, a growing body of research has demonstrated the beneficial potential of mindfulness in the workplace (Israni, 2021; Pinck and Sonnentag, 2018). Cultivation of mindfulness, the non-judgmental awareness of experiences in the present moment, produces beneficial effects on well-being and ameliorates psychiatric and stress-related symptoms (Hölzel et al., 2011). Furthermore, it has been shown that employee mindfulness is related to positive indicators of employee well-being, such as physical and psychological health (Glomb et al., 2011), positive affect (Giluk, 2009), job satisfaction (Hülsheger, Feinholdt and Nübold, 2015), social relationships, resiliency, and task performance (Glomb, 2015) and task commitment, performance, and memory (Levy et al., 2012). Research indicates that mindfulness training could be beneficial, not only for those engaged in what Career Cast, in a 2019 survey, have termed less stressful professions, such as hairstylists, but also for those in professions deemed stressful, such as specific military roles and firefighters (CareerCast, 2019). Several organisations implement mindfulness-based training programs for their employees, including Google, Target, Aetna, Dow Chemical, Intel, and the United States Marine Corps (Aikens et al., 2014; Jha et al., 2010; Wolever et al., 2012).

Mindfulness as a topic of academic research is now firmly established (Hanley et al., 2016). Lee et al. (2021) noted that there has been a sharp increase in mindfulness research since 2000. Several bibliometric analyses have examined trends and developments in mindfulness research, providing valuable models of the field's evolution and offering frameworks that could guide new research in the area. Bibliometrics is a set of methods to quantitatively analyse scientific and technical literature (Setti, 2013) and scholars use bibliometric analysis for a variety of reasons, such as to uncover emergent trends in article and journal performance, collaboration patterns, and research constituents, and to explore the intellectual structure of a specific domain in the extant literature (Donthu et al., 2021).

In a bibliometric analysis by Baminiwatta and Solangaarachchi (2021), trends and developments in mindfulness research over a span of 55 years were visualised, highlighting pivotal moments, key research areas, and emerging trends. The analysis also revealed that nearly half (47%) of the publications were in the field of psychology, while around one-fifth (20.8%) were in psychiatry. Additionally, Birrer, Scalvedi and Frings (2023) conducted a bibliometric analysis of mindfulness and acceptance research in sports from 1969 to 2021, providing a comprehensive overview of mindfulness literature with an emphasis on its wide-ranging applications and various settings. These analyses track key developments, influential articles and authors over decades, identifying foundational contributions and prominent research hubs within the mindfulness field. Another notable bibliometric study on mindfulness was conducted by Ferreira and Demarzo (2024), highlighting that mindfulness research has grown rapidly over the past two decades, with the U.S. leading in publications. This analysis also revealed that 2019 marked the peak year for mindfulness publications and the journal *Mindfulness* and author E. Garland were notably prolific.

Despite the growth of bibliometric studies, prior research has rarely focused on organisational contexts, making this analysis particularly timely. This bibliometric analysis aims to systematically document the trajectory of mindfulness research within organisational contexts. With mindfulness becoming increasingly central to workplace wellness initiatives, this method enables scholars to observe the expansion of mindfulness applications that might enhance employee productivity, resilience, and mental health. Through citation analysis, this bibliometric analysis identifies interdisciplinary collaboration patterns across psychology, management, neuroscience, and health sciences, revealing how mindfulness knowledge is distributed globally across fields. Such analysis illuminates the field's intellectual structure, contributing to both academic scholarship and practical applications within organisations. The study also underscores areas needing further exploration, such as mindfulness applications in specific employee groups or unique organisational environments.

This research provides a comprehensive bibliometric overview of workplace mindfulness practices over the past two decades as it spans from 2004 to 2024. The purpose of this article is to examine the world of published research on the topic of mindfulness practice. Guided by ten review questions, the study aims to map the growth rate of publications, highlight the most locally and globally cited documents, and determine the contributions of prominent authors and institutions. Additionally, the research examines the productivity of authors based on Lotka's Law, identifies active universities and countries, and analyses trending research themes. These questions underpin the data extraction and analysis process. They provide a structured framework to investigate how workplace mindfulness has evolved as a research domain and identify its most impactful contributors and topics.

This study builds upon existing bibliometric work by adopting a focused lens on the organisational setting, providing a nuanced look at how mindfulness research has evolved in this domain. In doing so, it offers a specialised perspective on the rapid growth of mindfulness research in recent years, particularly within applied and organisational psychology, management studies, and related fields. By comparing findings with those from previous bibliometric analyses, this research contextualises its contributions within the broader mindfulness literature, ultimately deepening the understanding of mindfulness as it applies to workplace wellness and employee productivity.

Methods

To embark on this bibliometric analysis, the author meticulously crafted a search string by using the Boolean operators of OR & AND. The finalised search string was:

(Mindfulness OR Mindfulness Practice OR Mindfulness Meditation OR Mindfulness-Based Program* OR MBP OR MBPs OR Mindfulness-Based training* OR MBT OR MBTs OR Mindfulness-Based Stress Reduction Program* OR MBSR OR MBSRs OR MBSRP OR Workplace Mindfulness OR Mindfulness Interventions) AND (Stress OR Work Stress OR Distress OR Work-Related Stress OR WRS OR Burnout OR Occupational Stress) AND (Office* OR Organisation* OR Organization OR Workplace OR Company OR Enterprise OR Institution)

The Web of Science (WOS) database was used for this bibliometric analysis. To conduct bibliometric analyses, researchers retrieve publications primarily from the Web of Science (WOS) and Scopus databases; however, studies comparing WOS and Scopus have shown that WOS has some unique strengths (Echchakoui, 2020). Chirici (2012) demonstrates that across numerous disciplines, WOS offers a varied range of information. Zyoud et al. (2017) argued that WOS includes the most reliable, high-impact scientific studies.

After finalising the search string and choosing the database, well-defined inclusion and exclusion criteria were developed. This bibliometric analysis included only articles, review articles and data papers. Other documents, such as proceeding papers, early access documents, book reviews and book chapters, were not included in the analysis. Documents published from 01st January 2004 till 14th June 2024 were included in the analysis. Documents published only in the English language were included. Finally, only fifteen web of science categories which were considered most appropriate for this analysis were included such as Management, Business and Psychology.

When the search string was run on the WOS database in the early morning hours of 15th June without using any inclusion and exclusion criteria, it yielded 5762 results; however, when the date ranges from 01/01/2004 till 14/06/2024 were applied, this number was reduced to 5690 records. When the filter for document type was applied, it came down to 5314. When many of the WOS categories, such as Psychiatry, were excluded, the records dropped to 1119. Finally, when the filter of only the English language was used, it yielded 1092 records. Out of the 1092 records included in the study, only 98 records were from the management category of WOS, and 46 records were from the business category. The maximum number of records, 383, were from the field of multidisciplinary psychology. The records included in this bibliometric analysis is 1092.

Data Extraction and Analysis

1092 full records and cited references were exported as a BibTex file from WOS and were then loaded as a raw file into biblioshiny: the shiny app for bibliometrix (Aria and Cuccurullo, 2017). Bibliometrix is a package for bibliometric analysis written in R. R is an ecosystem software, meaning it operates in an integrated environment which consists of open libraries, the open algorithm and open graphical software (Derviş, 2019). Review questions to guide the data extraction and analysis included-

1. What is the annual growth rate of scientific publications on workplace mindfulness practices from 01/01/2004 till 14/06/2024?
2. Which are the top ten most locally cited sources?
3. As per local citations, who are the first ten most relevant authors?
4. What is the productivity of the authors as per the Lotka's Law?
5. Which universities are most actively contributing to the research area?
6. Which countries contribute the most towards the scientific production of documents?
7. Which countries have the biggest number of corresponding authors and are most cited?
8. In the collection of 1092 documents, which are the most frequently used words, research themes and trending topics?
9. Which are the top ten most globally cited documents?
10. What is the gist, findings and summary of each of the ten most globally cited documents?

Result and Discussion

Table 1 below depicts the main information pertaining to the 1092 records analysed. It shows that the records included in the analysis were published from 2004 to 2024 (on which all of the further analysis has been performed). Out of the total number of 1092 documents, there are 978 articles, 113 review papers and 1 data paper. The annual growth rate percentage is typically calculated as the percentage change in the number of publications from one year to the next. The annual growth rate percentage of research on the topic is 19.28%.

Table 1: Summary of the Main Information

Description	Result
Main Information About Data	
Timespan	2004:2024
Sources (Journals, Books, etc)	277
Documents	1092
Annual Growth Rate %	19.28
Document Average Age	4.22
Average citations per doc	30.19
References	50358
Document Contents	
Keywords Plus (ID)	2463
Author's Keywords (DE)	2580
Authors	
Authors	4556
Authors of single-authored docs	39
Document types	
Article	978
Article; data paper	1
Review	113

Annual scientific production refers to the total output of scientific work generated by researchers, institutions, or countries within a given year. The line graph in Figure 1 below represents the yearly scientific production from 1st January 2004 till 14th June 2024, thereby addressing review question 1.

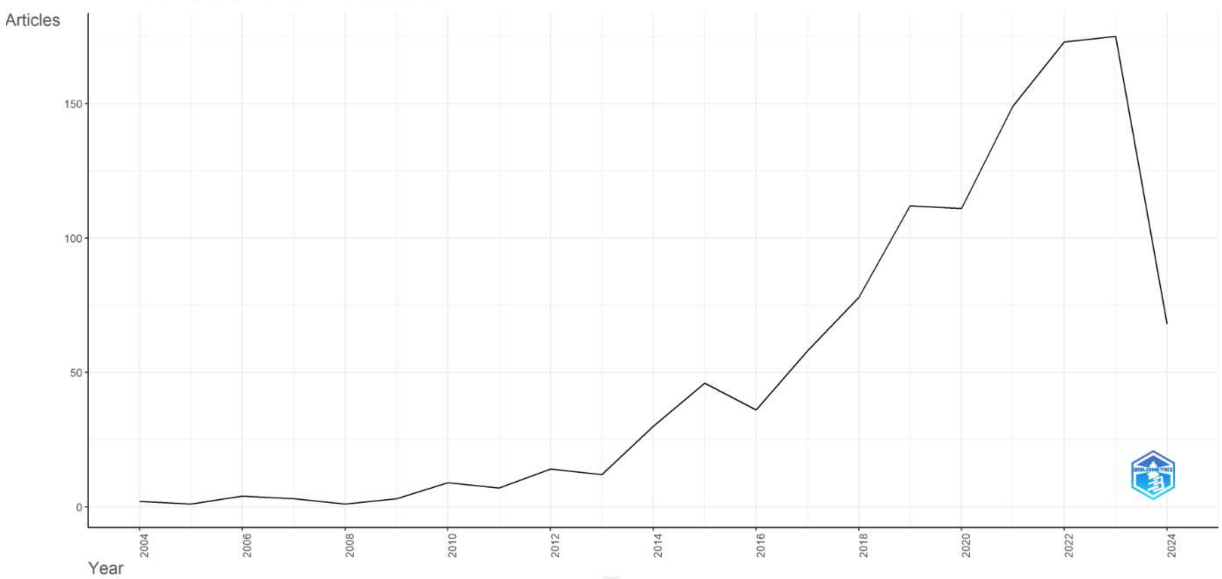

Figure 1: Annual Scientific Production

In the above line graph, the vertical axis of the line graph, also known as the y-axis, represents the "Articles" while the horizontal axis, or x-axis, shows the time period. The graph depicts that since the year 2020, there has been a steady increase in the number of articles till the year 2023, with a maximum number of 175 articles. This could be attributed to the COVID-19 pandemic outbreak in 2019. Research post-2020 established that the mental health and well-being of the employees were adversely affected (Giorgi et al., 2023). In this context, practising mindfulness seemed to be a viable option available to organisations for their employees, and a research study established that mindfulness meditation was able to lessen the psychological impact of COVID-19 (Zhu et al., 2021). Post 2022, there is a steep decline curve, which can be explained by the fact that only articles published till 14th June 2024 were included in the analysis. With almost another six months remaining in the calendar year of 2024, the number of articles is expected to increase from 68 to continue the increasing trend.

A three-field plot is a visualisation technique that focuses on relationships between three variables. Figure 2 below depicts a three-field plot that focuses on the relationship between cited references (CR), authors (AU), and the keywords (DE). The size of the areas representing each variable indicates its overall prominence within the dataset. Lines or connections between the areas show how these elements are linked. The width of the lines connecting entries within and between sections reflect the frequency of their co-occurrence.

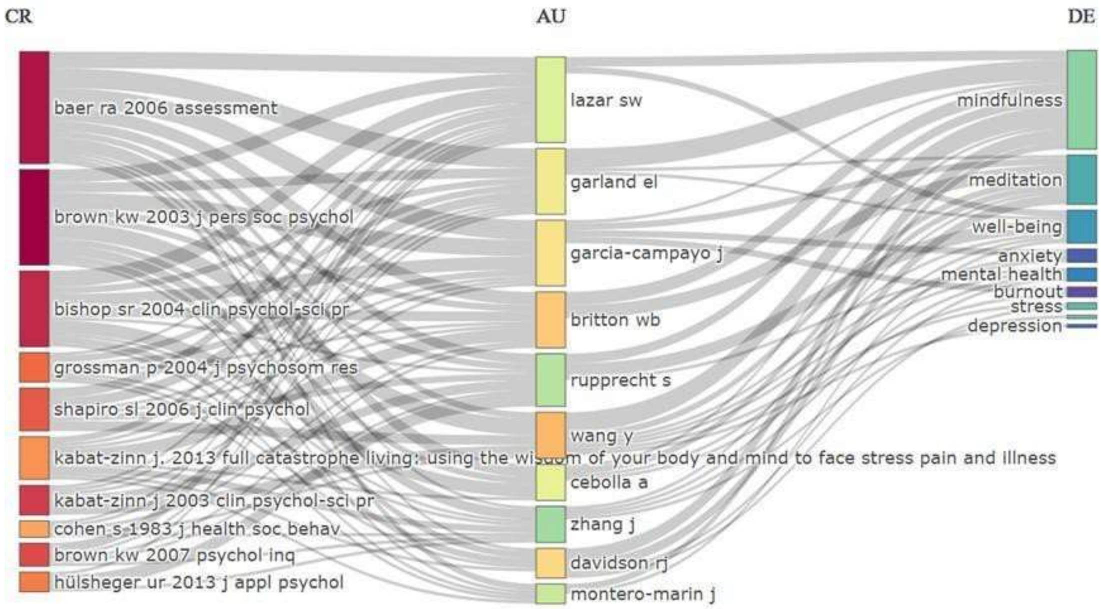

Figure 2: Three Field Plot

In bibliometric analysis, the term "sources" refers to the various outlets or venues where scientific research is published and disseminated, while "local citations " refer to citations within a specific dataset or collection of documents rather than the total citations an article receives across all databases. Local citations help gauge a source's or an author's influence and the relevance of their work within a particular research community or field. Fig 3 below depicts the ten most locally cited sources, thereby answering review question 2. Figure 3 below depicts that Mindfulness Journal is the most locally cited source, with 2159 local citations.

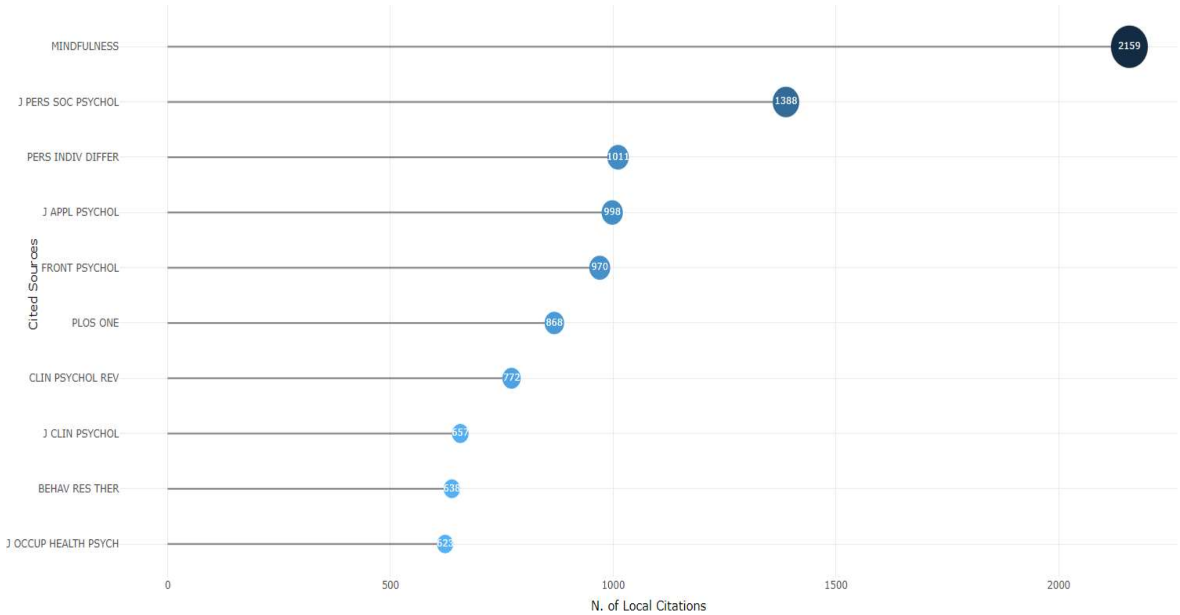

Figure 3: Ten most important sources

While Figure 3 above depicts the ten most important sources as per local citations, table 2 below lists ten authors as per their local citations, thereby answering review question 3. Britton WB tops the list with 81 local citations.

Table 2: Top Ten authors as per their Local Citations

Author	Local Citations
BRITTON WB	81
BRUMMEL BJ	68
DANE E	68
LAZAR SW	68
SARON CD	62
BREFCZYNSKI-LEWIS JA	57
FIELD BA	57
FOX KCR	57
GORCHOV J	57
KERR CE	57

Lotka's Law concentrates on the productivity of authors. The "number (of authors) making n contributions is about 1/n2 of those making one; and the proportion of all contributors that make a single contribution, is about 60 per cent" (Lotka, 1926, p. 323). In other words, many authors only write one paper, and far fewer authors write many papers. Figure 4 illustrates the distribution of author productivity in line with Lotka's Law and attempts to answer review question 4.

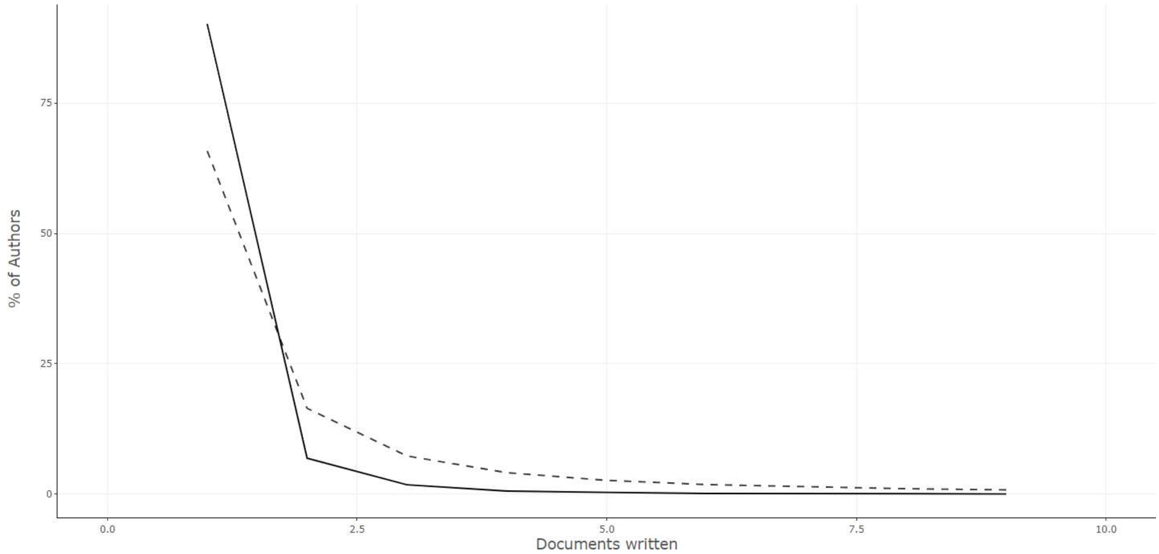

Figure 4: Distribution of Author Productivity (Lotka's Law)

In the above figure 4, the X-axis represents the number of papers written by authors ranging from 1 to 15. The Y-axis shows the percentage of authors who have written a certain number of documents. The curve represents the distribution of authors based on the number of documents they have written. At the leftmost part of the graph, there is a high percentage of authors, indicating that most authors have written only one document. As the number of documents increases, the percentage of authors decreases rapidly. This steep decline illustrates that there are significantly fewer authors who have written multiple documents. The curve flattens out as the number of documents increases, showing that very few authors have written many documents. In summary, this graph demonstrates that a large proportion of authors have contributed a single document, and only a small fraction of authors is prolific, aligning with the inverse square relationship described by Lotka's Law.

Most relevant affiliations include affiliations from universities, hospitals, research centres, or even companies that are most actively contributing to the research area. Table 3 below depicts that the top ten most important affiliations are all universities. Monash University in Australia tops the list with 44 articles. Therefore, this table answers review question 5.

Table 3: Most Important Affiliations

Affiliation	Article
Monash University	44
University of Wisconsin	42
Brown University	38
McGill University	37
Harvard Medical School	35
Karolinska Institute	32
Radboud University Nijmegen	32
University of California San Francisco	31
Vrije University Amsterdam	29
Colorado State University	26

Country scientific production refers to the output of scientific research and publications produced by researchers and institutions within a specific country. This measure helps evaluate the scientific contributions and impact of different nations in the global research community. In terms of frequency, country scientific production can be understood as the rate at which a country produces scientific outputs, such as research papers, articles, and other scholarly works, over a specific period. Table 4 below depicts that the United States of America leads with a frequency of 1444 documents. Table 4 also helps to answer review question 6.

Table 4: Scientific Production by Countries

Country	Frequency
USA	1444
China	550
Germany	408
Spain	321
Australia	316
UK	255
Netherlands	249
Canada	228
India	183
France	128

Figure 5 below depicts that the USA has the biggest number of corresponding authors and leads in Single Country Publications (SCP), which are scholarly publications authored by researchers from a single country, as well as in Multiple Country Publications (MCP), which refers to scholarly publications authored by researchers from multiple countries. Figure 5 answers the first part of review question 7, which describes the countries with the biggest numbers of corresponding authors.

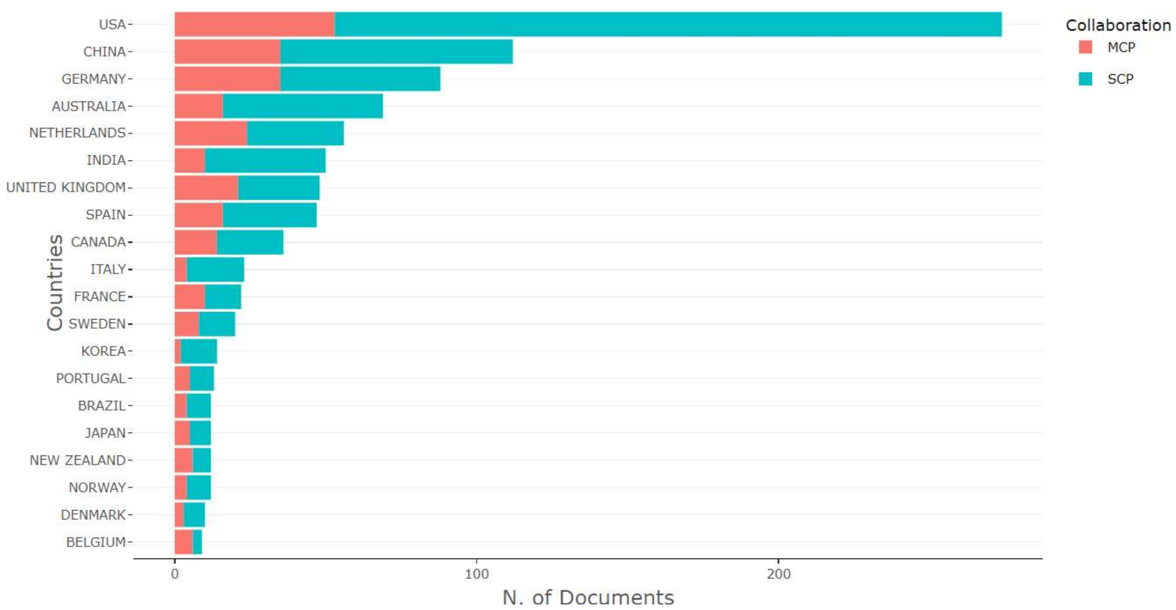

Figure 5: Countries with the biggest number of corresponding authors

Figure 6 below illustrates that the USA ranks as the most cited country, followed by Germany and Australia. This answers the second part of review question 7 regarding which countries are most frequently cited.

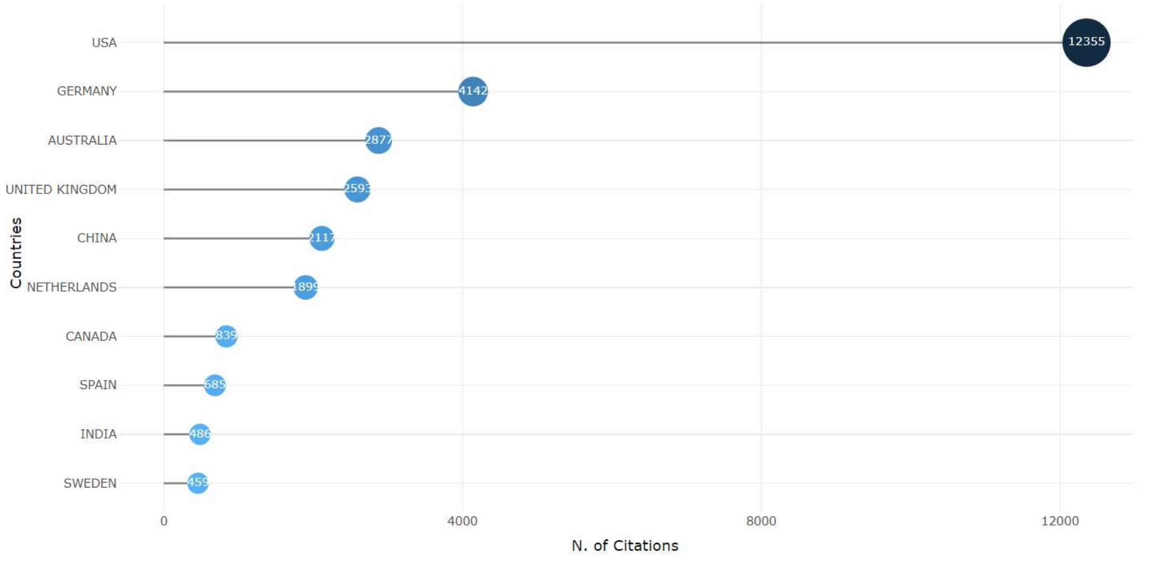

Figure 6: Most cited countries

A word cloud is a visual representation typically used to depict usually single words and their size and prominence is based on their frequency in the text. In the context of a bibliometric analysis, a word cloud can be used to identify the most frequent words or phrases in a collection of documents, which can help to get a sense of the overall focus of the research. Figure 7 below depicts the word cloud with "Stress"

"Mindfulness" "Stress Reduction" and "Meditation" as words used most frequently and answers review question 8.

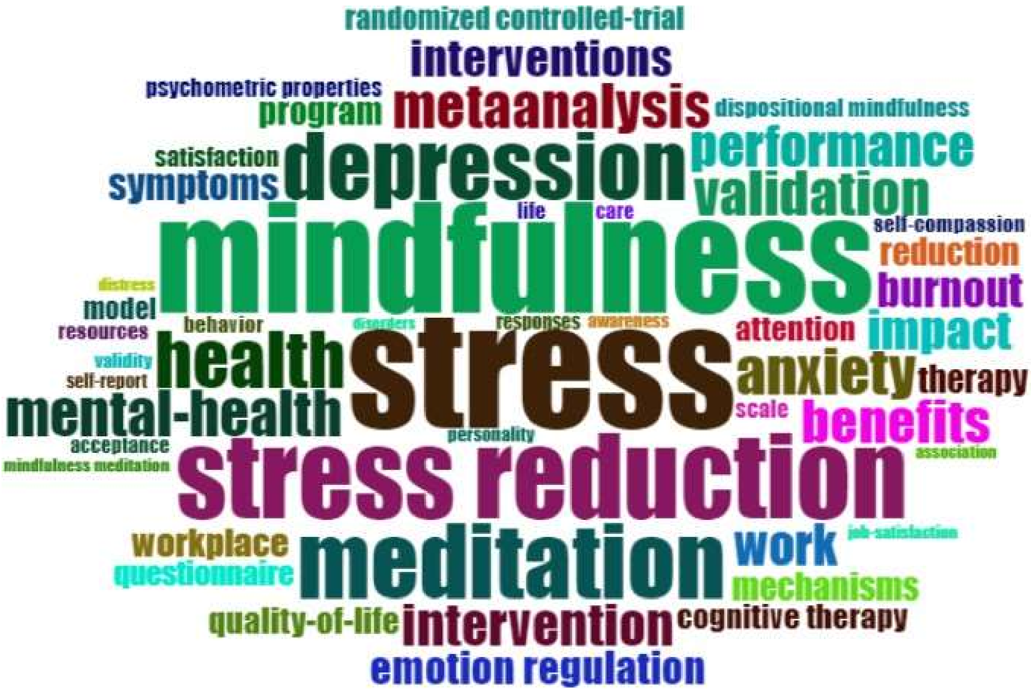

Figure 7: Word Cloud

Figure 8 below shows the thematic mapping of research themes based on author keywords, thereby answering and addressing review question 8.

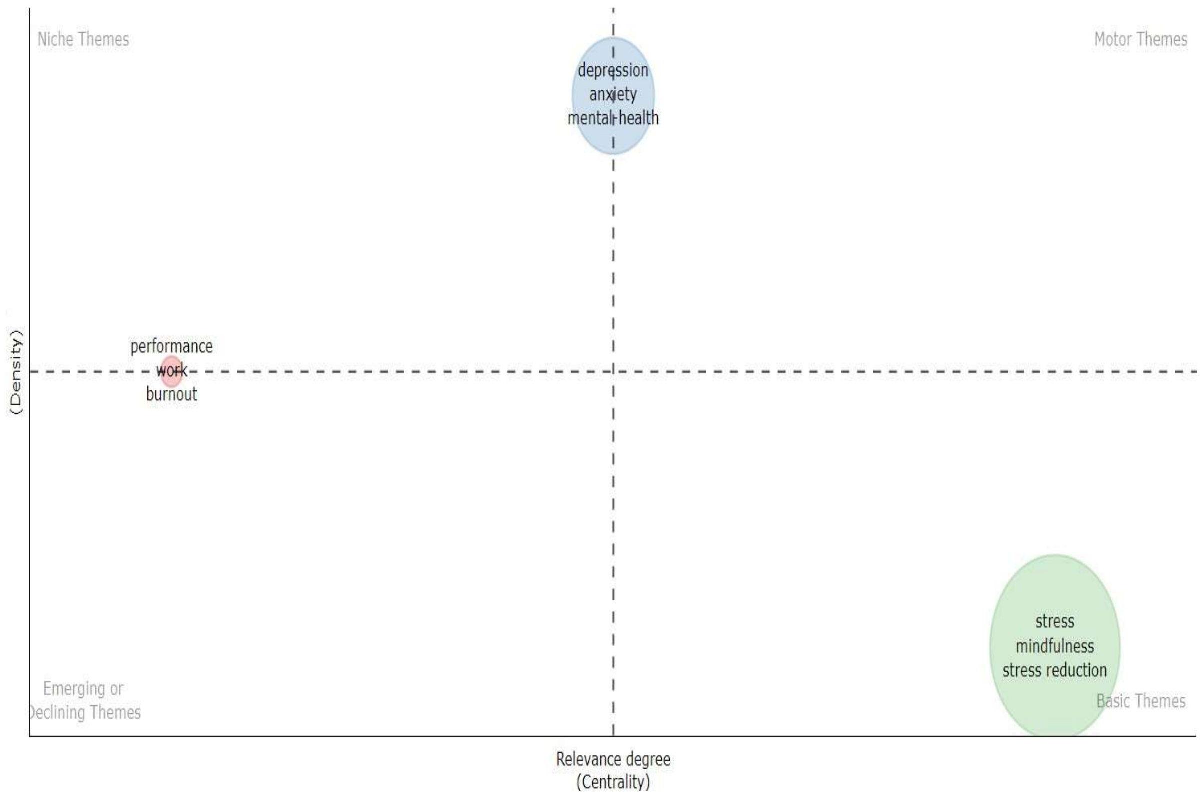

Figure 8: Thematic Mapping

The above thematic map is divided into 4 quadrants with niche themes, motor themes, emerging or declining themes, and basic or transversal themes. The niche themes are "non-central but developed", emerging or declining themes are "neither central nor developed" at the time of analysis, motor themes are "central and developed" implying the current research themes and basic themes are "central but undeveloped" which gives direction towards the future themes in research. The size of the clusters shows the number of keywords associated with it. The cluster with the highest density value shows the keywords "depression", "anxiety" and "mental health".

The cluster in the emerging or declining themes focuses on "work" and "burnout'' suggesting that these topics have not been studied much, due to which these concepts fall under the emerging theme and these concepts are yet in an exploratory phase in the research. It is important to note that the cluster in basic theme with "stress", "mindfulness" and "stress reduction" is the only cluster with high relevance and centrality and is yet to be developed more; this cluster is "central" but yet "undeveloped" and has the potential to grow further in the future and move towards the motor themes.

Finally, this section ends with Figure 9 below, depicting the ten most globally cited documents. This answers review question 9.

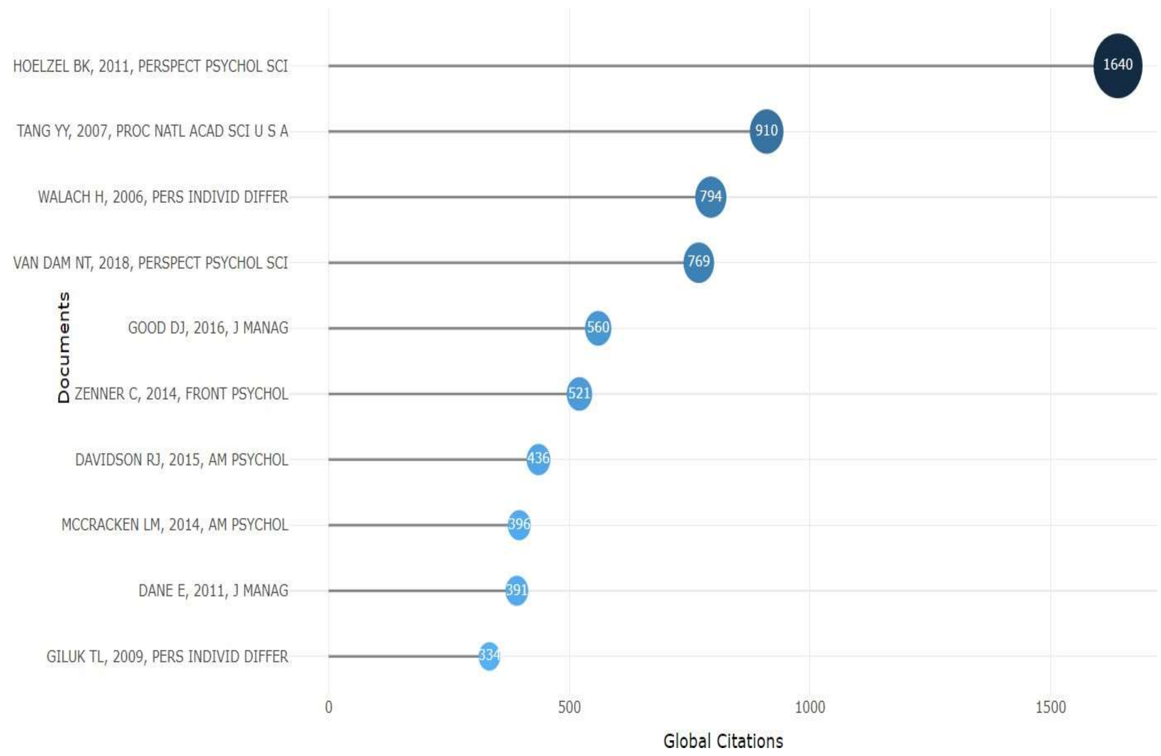

Figure 9: Globally Cited Documents

Findings and Summary of Ten Most Globally Cited Documents

Table 5 below details the ten most globally cited documents among the corpus of 1092 documents identified for this bibliometric analysis. Following this table, a summary of each paper is presented, providing a detailed answer to review question 10.

Table 5: Details of Ten Most Globally Cited Documents

S.No	Name of Paper	Name of Authors	Source	Year of Publication	DOI	Total Citations
1	How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective	Hölzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., and Ott, U.	Perspectives on psychological science	2011	10.1177/1745691611419671	1640
2	Short-term meditation training improves attention and self-regulation	Tang, Y. Y., Ma, Y., Wang, J., Fan, Y., Feng, S., Lu, Q., ... and Posner, M. I.	Proceedings of the National Academy of Sciences	2007	10.1073/pnas.0707678104	910
3	Measuring mindfulness—the Freiburg mindfulness inventory (FMI).	Walach, H., Buchheld, N., Buttenmüller, V., Kleinknecht, N., and Schmidt, S.	Personality and Individual Differences	2006	10.1016/j.paid.2005.11.025	794
4	Mind the hype: A critical evaluation and prescriptive agenda for research on mindfulness	Van Dam, N. T., Van Vugt, M. K., Vago, D. R., Schmalzl, L., Saron, C. D., Olendzki,	Perspectives on Psychological Science	2018	10.1177/1745691617709589	769

	and meditation	A., ... and Meyer, D. E.				
5	Contemplating mindfulness at work: An integrative review	Good, D. J., Lyddy, C. J., Glomb, T. M., Bono, J. E., Brown, K. W., Duffy, M. K., ... and Lazar, S. W.	Journal of Management	2016	10.1177/0149206315617003	560
6	Mindfulness-based interventions in schools—a systematic review and meta-analysis.	Zenner, C., Herrnleben-Kurz, S., and Walach, H.	Frontiers in Psychology	2014	10.3389/fpsyg.2014.00603	521
7	Conceptual and methodological issues in research on mindfulness and meditation	Davidson, R. J., and Kaszniak, A. W.	American Psychologist	2015	10.1037/a0039512	436
8	Acceptance and commitment therapy and mindfulness for chronic pain: model, process, and progress.	McCracken, L. M., and Vowles, K. E.	American Psychologist	2014	10.1037/a0035623	396

9	Paying attention to mindfulness and its effects on task performance in the workplace	Dane, E.	Journal of Management	2011	10.1177/0149206310367948	391
10	Mindfulness, Big Five personality, and affect: A meta-analysis.	Giluk, T. L.	Personality and Individual Differences	2009	10.1016/j.paid.2009.06.026	334

Hölzel et al. (2011) proposed components to describe the mechanisms through which mindfulness works. Their theoretical review integrated the existing literature into a comprehensive theoretical framework paper to propose that mindfulness meditation exerts its effects through (a) attention regulation, (b) body awareness, (c) emotion regulation (including reappraisal and exposure, extinction, and reconsolidation), and (d) change in perspective on the self.

Tang et al. (2007) asserted that short-term meditation training improves attention and self-regulation. Their efficacy study explored the influence of mindfulness meditation training by using experimental and control methods. In their study, they showed that an experimental group of 40 undergraduate Chinese students given 5 days of 20-min integrative training of which mindfulness meditation was a part showed greater improvement in conflict scores on the attention network test, lower anxiety, depression, anger, and fatigue, and higher vigour on the profile of mood states scale, a significant decrease in stress-related cortisol, and an increase in immunoreactivity than the control group.

Walach et al. (2006) aimed at measuring mindfulness and developed the "Freiburg Mindfulness Inventory (FMI)" to assess mindfulness in clinical and non-clinical populations. The FMI was constructed through expert interviews and literature analysis and was validated through two studies. The first study involved 115 mindfulness meditation retreat attendees and resulted in a 30-item scale with high internal consistency (Cronbach alpha = .93), which effectively measured increases in mindfulness post-retreat and differentiated between novice and experienced meditators. The second study expanded the FMI's application to 86 non-meditators, 117 individuals with clinical issues, and 54 retreat participants. This led to the creation of a 14-item short form with strong psychometric properties (alpha = .86). The short form demonstrated significant correlations with related constructs (self-awareness, dissociation, global severity index, meditation experience) and proved sensitive to change, making it suitable for use with both meditators and non-meditators. The Principal Component Analysis (PCA) conducted in the study indicated that Mindfulness is the one common factor underlying the items of the Freiburg Mindfulness Inventory (FMI). This suggested that the various items on the inventory all measured a single, unified construct of mindfulness. This finding supported the conceptual integrity of the FMI as a coherent tool for assessing mindfulness, whether in its full 30-item version or its abbreviated 14-item form.

Van Dam et al. (2018), in their paper, critically examined the state of research on mindfulness and meditation by highlighting several key issues. They noted that significant criticism faced by the mindfulness movement was due to misinformation and poor research methodology, which could mislead the public and potentially cause harm. They proposed a comprehensive agenda for future research, which included paying more attention to the potential negative outcomes of mindfulness practice so that the public receives accurate information.

Good et al. (2016), in their integrative review, aimed to combine the burgeoning body of mindfulness scholarship with organisational science by presenting a framework which can provide insights for organisational leaders as well as guide future management research. Their framework identified how mindfulness influences attention, with downstream effects on functional domains of cognition, emotion, behaviour and physiology. Good et al. (2016) asserted that these domains ultimately impact key workplace outcomes, including performance, interpersonal relationships, and well-being. Figure 10 below depicts the fundamental ways in which mindfulness appears to influence human functioning to yield workplace outcome areas such as performance, interpersonal relationships, and well-being.

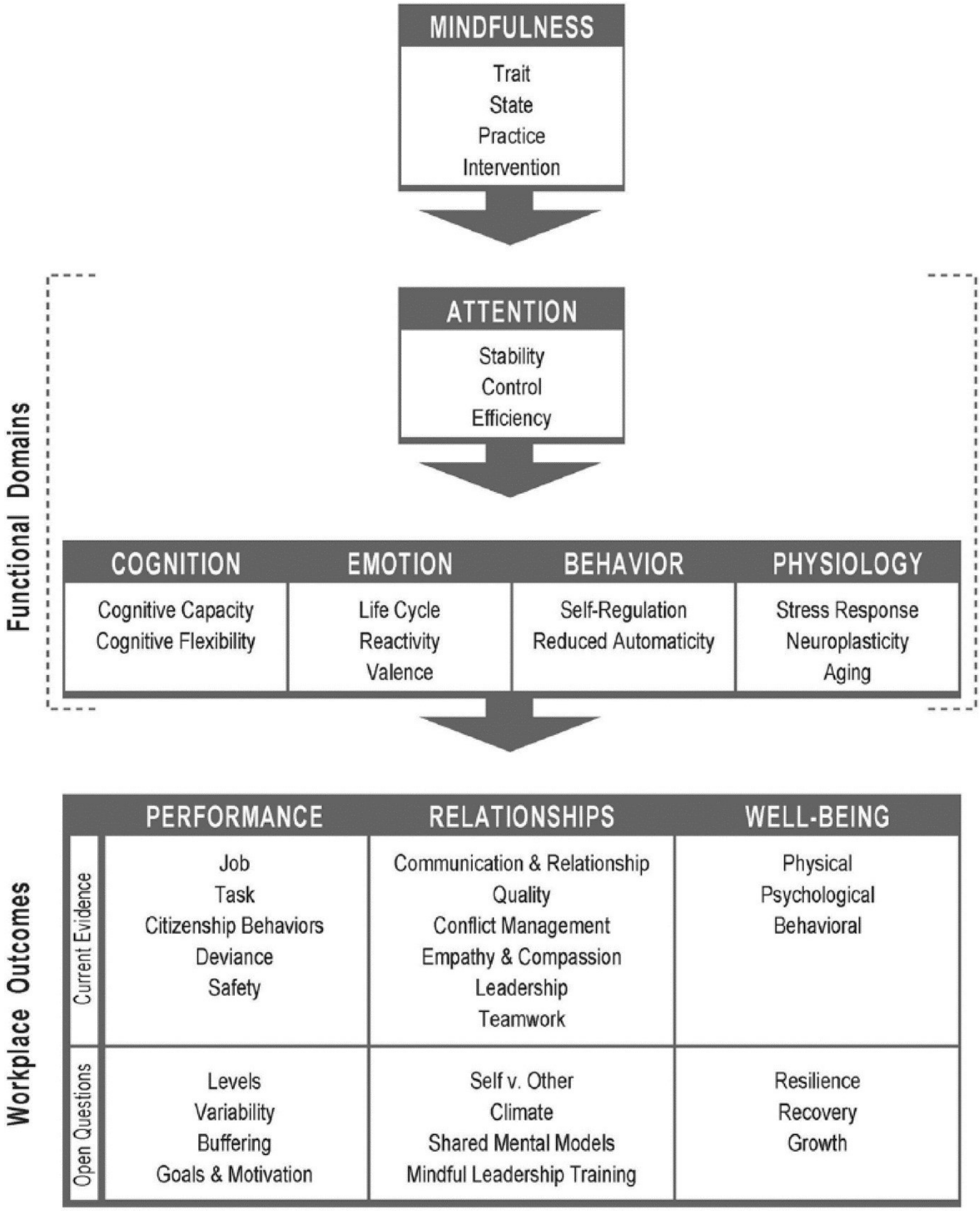

Figure 11: Mindfulness Influences Human Functioning (Good et al., 2016)

Zenner, Herrnleben-Kurz, and Walach (2014) conducted a systematic review and meta-analyses to study mindfulness-based interventions in schools. They reviewed the impact of school-based mindfulness programs on psychological outcomes. Conducting comprehensive searches across 12 databases and additional hand searches, the authors identified 24 studies involving 1348 students receiving mindfulness instruction and 876 controls, from grades 1 to 12. The meta-analysis revealed moderate overall effect sizes (Hedge's g = 0.40 between groups and g = 0.41 within groups), with significant benefits observed in cognitive performance (g = 0.80), stress reduction (g = 0.39), and resilience (g = 0.36). However, effects on emotional problems and third-person ratings were not significant. The study highlighted the potential of mindfulness interventions to enhance cognitive performance and stress resilience among children and youths. Zenner, Herrnleben-Kurz, and Walach (2014) acknowledged that despite promising findings, their review was marked by significant heterogeneity, underpowered studies, and diverse methodologies, necessitating careful analysis and improved research designs to fully understand and optimise mindfulness interventions in educational settings.

Davidson and Kaszniak (2015) examined the key issues in studying mindfulness-based interventions. They stressed the importance of detailed descriptions of the intervention itself and how it is delivered. Accurately measuring mindfulness among beginners and experienced practitioners was also a focus of their paper. They pointed out that the construct of mindfulness cannot be captured in any simple single physiological or biological measure; however, behavioural indicators could be a promising option for measuring mindfulness. They highlighted the need for more rigorous studies to definitively prove the effectiveness of mindfulness-based interventions for treating specific conditions or promoting well-being.

McCracken and Vowles (2014) pointed that the success of traditional Cognitive Behavioural Therapy (CBT) for chronic pain according to the rate at which it has produced new and more effective treatment methods, has been more modest. Furthermore, they noted that CBT, though widely accepted and successful in chronic pain treatment, may have become overly focused on methods and less on the underlying processes that make treatment work. They advocated reversing this so that research and treatment development are firmer on process and loose on method. They presented Acceptance and Commitment Therapy (ACT) specifically and Contextual Cognitive Behavioral Therapy (CCBT) more broadly as potential routes toward progress, which require no major shift in treatment techniques but a shift in the process of development. They suggested a three-step process of development: (a) Let go of variables and processes that have ceased to be useful guides for research and treatment development, (b) choose scientific goals and philosophical assumptions, and (c) begin treatment development guided by process and theory. seeking ways to act successfully in the world.

Dane (2011) developed a theory surrounding the nature of mindfulness and its effects on task performance in workplace settings. After visiting various definitions of mindfulness, he defined mindfulness as a state of consciousness in which attention is focused on present-moment phenomena occurring both externally and internally. He differentiated mindfulness from other states of attention as is shown in table 6 below.

Table 6: Differentiating Mindfulness from other states of Attention.

		Attentional Breadth	
		Relatively Wide	Relatively Narrow
Present Moment Orientation	High	*Mindfulness*	*Absorption* *Flow*
	Low	*Mind Wandering*	*Counterfactual Thinking* *Prospection* *Fantasizing*

Source: Dane (2011)

Furthermore, Dane (2011) gave four propositions for developing a theory concerning the factors determining when mindfulness is beneficial versus costly from a task performance standpoint. He made these propositions- Proposition 1: Wide external attentional breadth fosters task performance in a dynamic task environment and inhibits task performance in a static task environment. A dynamic task environment is one in which individuals make a series of interdependent decisions in real time (Gonzalez, 2005), while static environments involve relatively stable and predictable relationships (Nadkarni and Barr, 2008). Proposition 2: Wide internal attentional breadth fosters task performance when one has a high level of task expertise, and it inhibits task performance when one is a task novice. Proposition 3: The relationship between mindfulness and task performance is positive when one operates in a dynamic task environment and has a high level of task expertise. Proposition 4: The relationship between mindfulness and task performance is negative when one operates in a static task environment and is a task novice.

Giluk (2009) used the meta-analysis, an analytical tool to synthesize findings from 32 samples in 29 studies in order to provide a more precise empirical estimate of the relationship between mindfulness and the Big Five personality traits as well as trait affect. The five-factor (Big Five) model of personality consists of the trait's neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness (Barrick, Mount and Judge, 2001). According to Giluk (2009) positive and negative affect are the two dominant dimensions that consistently emerge in studies of affect. High positive affect is described as a state of full concentration, one in which individuals are alert, energetic, and engaged while trait negative affect reflects the extent to which someone feels a variety of unpleasurable moods, such as distress, nervousness, guilt, or anger, and is highly correlated with the personality trait neuroticism (Watson, Clark and Tellegen, 1988). Results of Giluk's quantitative review indicated that, while all of the traits display appreciable relationships with mindfulness, the strongest relationships are found with neuroticism, conscientiousness, and negative affect.

Out of the top ten most globally cited documents in the corpus of 1092 documents, only two documents were published in "The Journal of Management " while the rest of the documents were published mainly in Psychology Journals.

Discussion

The review questions were systematically addressed, revealing comprehensive insights into the field of workplace mindfulness practices. Analysis of the annual growth rate of publications from 2004 to 2024 demonstrated a consistent increase, underscoring the rising scholarly interest in mindfulness as a workplace intervention. The study identified the top ten most locally cited sources and authors. Applying Lotka's Law to author productivity further illustrated patterns in scholarly contributions, highlighting the dominance of certain authors in this field.

Additionally, the research identified universities and countries actively contributing to workplace mindfulness research, with specific countries leading in both the volume of corresponding authors and citation impact. A thematic analysis of 1,094 documents revealed frequently used keywords, prominent research themes, and trending topics, showcasing evolving areas of focus within workplace mindfulness research. The ten most globally cited documents were examined, offering insights into seminal works that have shaped the field and provided a foundation for subsequent research.

Only two of the ten most globally cited documents directly addressed workplace settings, underscoring a gap in highly cited workplace-specific mindfulness research. It suggests a broader appeal of mindfulness that transcends specific contexts. This reflects a common trend in foundational research, where early studies tend to explore general mechanisms, applications, and psychological benefits of mindfulness that later evolve into context-specific adaptations. The broader focus allows researchers to establish foundational frameworks, such as mechanisms of mindfulness and methodologies, which are later applied to particular domains like the workplace. This finding allows future studies to explore why general mindfulness literature dominates and how workplace-specific mindfulness studies might gain greater visibility and impact.

The study incorporated various analytical tools—such as the three-field plot, local citation analysis, and top author identification—to map the intellectual landscape of workplace mindfulness research. For instance, the three-field plot connects the relationships between keywords, sources, and authors, helping to uncover emerging themes and key contributors. Similarly, analysing local citations offers insight into influential works within this niche field, which is essential for understanding how specific ideas circulate and shape subsequent research.

Summarising the content of these globally cited papers aimed to provide a foundational understanding of the broader mindfulness research landscape; however, a more focused examination of their implications for workplace applications would enhance the study's relevance. There were several points of convergence and divergence within the top 10 cited papers in mindfulness.

Works such as Hölzel et al. (2011) and Tang et al. (2007) emphasise the mechanisms of mindfulness, including attentional regulation, emotional regulation and self-awareness. These mechanisms are universally relevant, underpinning why mindfulness is applicable in varied contexts (including but not limited to workplace settings).

A common thread across these highly cited documents is the exploration of mindfulness mechanisms and measurement tools, which are crucial for establishing mindfulness as a scientifically credible intervention. Many of these studies delve into neurological and psychological benefits. Studies by Hölzel et al. (2011), Tang et al. (2007) and Van Dam et al. (2018) focus on the psychological and neurological mechanisms through which mindfulness practices yield benefits. For instance, Hölzel et al. (2011) outline mechanisms such as attention, body awareness and emotional regulation—essential for understanding mindfulness's impact, regardless of specific context.

While foundational papers dominate, two of the cited works focus specifically on workplace applications and contextual adaptations. Dane's study (2011) and Good et al.'s (2016) integrative review explore mindfulness within workplace environments. These studies diverge by examining mindfulness in the context of job performance, productivity and stress reduction specific to organisational settings. The work by Good et al. (2016) synthesises findings that link mindfulness practices with work-related outcomes, establishing a bridge from general mindfulness research to the unique challenges of the workplace.

The limited number of workplace-specific studies among the most cited documents suggests that while mindfulness has been widely researched, there is still a need for studies tailored to organisational settings. Foundational studies on mechanisms and measurements laid the groundwork for workplace mindfulness but were not designed to address work-related stress directly. Although mindfulness has proven benefits, there are numerous inhibitors to its consistent practice in daily workplace environments. Factors such as high workloads, limited time, and a lack of organisational support can make it challenging for employees to engage regularly in mindfulness practices (Israni and Imbusch, 2022; Israni, Basini and Feeney, 2024). This presents an opportunity for future research to explore these barriers in depth and to develop practical strategies for integrating mindfulness into work routines. By focusing on how these mechanisms play out specifically in workplace settings, future studies can better address employee well-being and performance.

Limitations and Future Research

While this study is important, the application of bibliometric analysis to investigate trends in mindfulness practice at workplaces is not without some drawbacks. This bibliometric analysis was limited to publications listed in the Web of Science (WOS). Although WOS is among the largest global databases, relying on 1092 publications solely from the WOS database suggests that this study is less likely to include all articles on mindfulness at workplaces to alleviate work-related stress. The WOS database remained the most preferred choice for this bibliometric analysis due to its strength over other databases, particularly for social sciences. Another database that can be combined with the WOS databases for running the analysis in Biblioshiny is Scopus. WOS was not combined with Scopus, which may be seen as the limitation of this bibliometric analysis. Furthermore, the data employed for the analysis was extracted from only three types of documents (articles, reviews and data papers) published in the English language. These decisions were taken to keep the analysis simple and focused.

The search strategy employed a combination of keywords and WOS categories to identify relevant publications. However, inherent limitations in keyword searching and the potential for database miscategorisation may have resulted in a small number of irrelevant documents being included. To assess overall relevance, a statistically significant random sample of ten percent of titles was manually screened. The bibliometric analysis uses quantitative methods. Hence, the content or the quality of publications cannot be interpreted (Dunk and Arbon, 2009). As with many bibliometric analyses, this remains the limitation with this bibliometric analysis too.

Based on the above limitations characterising this bibliometric analysis, it is recommended that future research combine a bibliometric analysis with either content analysis or a systematic literature review.

A noted limitation of the study is the apparent decline in publications from 2023 to 2024. This dip is likely an artefact of the study period ending in June 2024, excluding data for the latter half of the year. Future analyses should consider a July-to-June window to provide a more stable measure of publication trends over time. A comprehensive year-on-year analysis would clarify whether the decline reflects a true reduction in research output or is simply due to the period cut-off. Such adjustments are important to offer more accurate insights into the field's growth trajectory.

This bibliometric analysis highlights critical developments in this field while also revealing areas for future investigation. The study underscores a substantial gap in bibliometric analyses focusing on mindfulness applications across specific employee groups and diverse organisational contexts. As workplace stress management becomes increasingly relevant, a deeper understanding of how mindfulness is employed in various industries—such as healthcare, education, commercial organisations and technology—could offer insights into more tailored interventions.

Conclusion

Over the past two decades, mindfulness meditation has transitioned from a fringe topic to a mainstream practice, used in psychotherapy, corporate well-being, education, and military training; however, owing to its longstanding reputation as a topic best suited for Psychology, mindfulness has remained outside the purview of many disciplines, including management. Although the concept of mindfulness has now begun to attract scholarly attention across other disciplines, research on mindfulness in the field of management and business remains limited. The recent evidence showing that mindfulness may benefit work outcomes (Hunter and McCormick, 2008) and that mindfulness-based programmes are effective in reducing stress in working adults (Lomas, 2017; Bazarko et al., 2013), scholars are encouraged to continue to understand the various facets and antecedents of mindfulness practice in workplaces (Kaur and Israni, 2019).

In conclusion, this study successfully addressed all review questions, offering a comprehensive bibliometric overview of workplace mindfulness research from 2004 to 2024. Findings illustrate the field's growth trajectory, key contributors, and influential institutions while highlighting significant global contributions and thematic trends. The study identifies critical areas for future research and practical applications, emphasising the potential of mindfulness practices to enhance workplace well-being and productivity.

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Digital Empowerment in Agriculture: Evaluating Digital Infrastructure, Services, Benefits, and Challenges for Smallholder Farmers in Chongwe, Zambia

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Abstract

The adoption of digital solutions by smallholder farmers can enhance both input and output market participation, market information, and reduce the cost of selling farm produce thereby increasing productivity. The objectives of this study was to assess the digital empowerment of smallholder farmers in Chongwe, Zambia by evaluating the existing digital infrastructure, available services, perceived benefits, and challenges, with the aim of providing insights that can inform strategies to enhance the effective integration and utilization of digital solutions in agricultural practices. The study followed a mixed methods paradigm using a three-stage sampling procedure. In stage 1, Chongwe district was purposively sampled out of 6 districts in Lusaka province. In stage 2, Nkomesha Block was purposively samples out of 5 agriculture blocks of Chongwe district. In the last stage, 4 agriculture camps were randomly selected out of 6 camps in Nkomesha Block. Then Yamane's formula was used to randomly sample 92 smallholder farmers. For qualitative data, 5 key informants were purposively selected for in-depth interviews. The findings were that out of 92 respondents on digital infrastructure available for smallholder farmers in Chongwe, 89 had mobile phones although 59 only had ordinary phones while 30 had smart phones; 55 had internet connection; 2 were connected to national electricity grid, and 87 used solar powered electricity. Out of 92 respondents on digital services available for smallholder farmers, smallholder farmers in Chongwe receiving extension services through three main channels: 78 were through extension works, 69 through radio, and 43 through TV; and 90 used mobile money for financial transactions. Out of 92 respondents on the benefits of digital solutions to smallholder farmers, 91 benefited social *interactions, 90 benefited enhance extension linkages, 66 benefited access to agriculture information, and 89 benefited elimination of middlemen. Out of 92 respondents on the major digital challenges smallholder farmers face, 87 faced high cost of phones, 83 mistrust due to scammers, and 81 high cost of maintenance.*

Key words: *Agriculture, Digital Empowerment, Infrastructure, Services, Benefits, Challenges, Smallholder Farmers*

Introduction

Almost 9% of the world population suffer from hunger and malnourishment (Roser and Ritchie, 2019). From a total of 2 billion people of the world population which suffer from food insecurity, 1.04 billion (52%) are in Asia, 678 million (34%) are in Africa, and 188 million (9%) are in Latin America (FAO et al., 2019, p. 20). In developing countries including sub-Saharan Africa, agriculture is the main economic activity and the main employer (Akinwale et al., 2023). Most of sub-Saharan Africa population live in poverty with 60% living on less than US$2 a day, and 40% living on less than US$1 a day (Mutsvangwa-Sammie and Manzungu, 2021). The agriculture sector in Africa is underdeveloped due to among other factors, low adoption and use of digital solutions (Abdulai et al., 2023b). The huge agriculture potential in Sub-Sahara African can be exploited by adoption of digital solutions which has been declared as a game changer for agricultural productivity (Agyekumhene et al., 2018; Atanga, 2020; Duncan et al., 2021; Etwire et al., 2017).

The adoption of digital solutions unlocks the digital services for smallholder farmers in Chongwe district, which include electronic agriculture extension (e-agriculture), electronic banking (e-banking) services such as mobile money, digital payment platforms, and e-market services. However, the adoption of digital solutions by smallholder farmers depends on the availability of digital infrastructure such as mobile phones, the internet connectivity, and the availability of electricity in rural areas where smallholder farmers dwell. The adoption of digital solutions can bring huge benefit to the smallholder farmers in Chongwe. Digital solutions can improve smallholder farming productivity (Quayson et al., 2020). There are several factors affecting the adoption of digital solutions by smallholder farmers such as insufficient electricity (Musa et al., 2013) and poor internet connectivity, and their low access to mobile phones (Kieti et al., 2022), high costs of both buying digital solution gadgets and maintaining them (Izuogu et al., 2023; Mansour, 2023), and the mistrust caused by scammers (Kieti et al., 2022).

Background

The development of agriculture in Sub-Sahara African countries has undergone significant technological transformation over the years, notably the rapid introduction and adoption of digital technology in agriculture (Miine et al., 2023). The adoption of new technologies improves agricultural production (Bontsa et al., 2023). As smallholder farmers' digital solutions are increasingly promoted in Africa (Kim et al., 2020; Tsan et al., 2019), their adoption and usage must be well-understood to facilitate the scaling up (Abdulai et al., 2023a). Assessing the level of smallholder farmers' digitalization in Africa can drive progress toward solving their productivity challenges and exploit economic potentials (Kim et al., 2020; Tsan et al., 2019). Digital agriculture can help increase crop yield, improve agricultural sustainability and food security (Goedde et al., 2021) and reduce the cost of farming through reduction in cost of transaction (Issa et al., 2003).

Despite the potential benefits of digital solutions to smallholder farmers, the adoption of digital agriculture solutions is still low in Sub-Sahara Africa (SSA) including Zambian. Goedde et al. (2021), argue that only 30 % of smallholder farmers in SSA have adopted digital solutions. Digital solutions facilitate smallholder farming transformation (Kudama et al., 2021) hence the increase in their productivity. However, the adoption of digital solutions by smallholder farmers in Chongwe district depends on the availability of digital infrastructure such as mobile phones, internet connectivity, and the availability of electricity.

Statement of the Problem

There is a problem of reduced productivity by smallholder farmers in the Zambia due to several factors, including lack of digital technology, a situation which erodes their profitability. Despite Sub-Sahara Africa currently having very high penetration and adoption of digital solutions (Mapiye et al., 2021, p. 15), the penetration of mobile phones and the delivery of internet and mobile network connectivity especially in rural areas has lagged due to several challenges (Trendov et al., 2019) such as high cost of smartphones. This situation has negatively affected the smallholder farmers' productivity and profitability. The difficulty arising from this problem is that the national and household food security is at risk as smallholder farmers' yields continue to decline amidst many challenges including adverse weather conditions due to climate change. A report by Sylvester (2017) argued that existing research on Sub-Sahara Africa's agricultural digital technology is still patchy and on-going. While some studies tried to address smallholder farmers' digital solutions adoption behaviour (Abate, 2023; Abdulai et al., 2023b; Bontsa et al., 2023; Dong et al., 2022; Fadeyi et al., 2022; Hendrawan et al., 2023; Nyagango et al., 2023; Parlasca et al., 2022; Taheri et al., 2022; Verma and Sinha, 2018), most of these studies may not specifically address the Zambian smallholder farmers' digital empowerment. Therefore, a mixed methods study employing a three-stage sampling procedure was conducted to specifically evaluate the digital infrastructure, services, benefits, and challenges for smallholder farmers in Chongwe, Zambia to address the digital empowerment for smallholder farmers in Zambia.

Aim of the Study

The aim of this study was to assess the digital empowerment of smallholder farmers in Chongwe District by evaluating the existing digital infrastructure, available services, perceived benefits, and challenges, with the aim of providing insights that could inform strategies to enhance the effective integration and utilization of digital solutions in agricultural practices.

Specific Objectives

1. To determine the digital infrastructure available for smallholder farmers in Chongwe district.
2. To determine the digital services available for smallholder farmers in Chongwe district.
3. To determine the benefits of digital solutions to smallholder farmers in Chongwe district.
4. To determine the major digital challenges faced by smallholder farmers in Chongwe district.

Overarching Research Question

How does digital ecosystem impact the empowerment of smallholder farmers in Chongwe district, considering the interplay of digital infrastructure, available services, perceived benefits, and challenges, and what insights can be gained to enhance the digital empowerment of farmers in this agricultural context?

Research Questions

1. What digital infrastructure is available for smallholder farmers in Chongwe district?
2. What digital services are available for smallholder farmers in Chongwe district?
3. What digital solutions benefits do smallholder farmers have in Chongwe district?
4. What are the major digital challenges faced by smallholder farmers in Chongwe district?

Study Scope

This research study was confined within the Zambian agriculture industry and it was restricted to Chongwe districts in Zambia. Selected players such as smallholder farmers, District Agriculture Coordinator, Ministry of Science and Technology officer, Ministry of Information officer, Food and Agriculture Organization officer took part in the study. The study addressed only the issues of digital solutions among smallholder farmers in Chongwe district. The study could not be extended to other districts because of inadequate resources and time.

Justification of the Study

This study was justified by several reasons most of which was drawn from literature. There was little evidence of a study that was conducted to show the digital empowerment of smallholder farmers in Chongwe. While some studies tried to address smallholder farmers' digital solutions in Sub-Sahara Africa (Abate, 2023; Abdulai et al., 2023b; Bontsa et al., 2023; Dong et al., 2022; Fadeyi et al., 2022; Hendrawan et al., 2023; Nyagango et al., 2023; Parlasca et al., 2022; Taheri et al., 2022; Verma and Sinha, 2018), most of these studies were not specifically conducted in Zambia and most of them were desk research studies (Degila et al., 2023; Farayola et al., 2020; Izuogu et al., 2023; Kudama et al., 2021; Mapiye et al, 2021; Mushi et al., 2022; Quayson et al., 2020; Sekabira et al., 2023; Smidt and Jokonya, 2022). Therefore, a study that would specifically address the digital solution adoption for smallholder farmers in Zambia by carrying out a mixed methods survey was necessary in order to address the challenges of smallholder farmers' low productivity.

Significance of the study

The results of the study would help the agricultural input providers, extension officers, government service providers and Non-Governmental Organizations to identify practical solutions to low productivity of smallholder farmers. The results of this study would also help government to come up with appropriate policy directions that would positively impact the agriculture sector. This research would add to the body of knowledge because little research in digital technology for smallholder farmers have been conducted in Zambia. Secondly, most of the research in smallholder farmers and digital technology was desk research that didn't provide primary data.

Literature Review

Introduction

This chapter discussed the digital infrastructure, the digital services, the benefits of digital solutions to smallholder farmers, and factors affecting the adoption of digital solutions among smallholder farmers.

Theoretical and Conceptual Framework

This study is guided by the Systems Theory, the Value Chain Theory, the Technology Adoption Model (TAM) theory, and the Diffusion of Innovation Theory (DOI).

The Systems Theory

The Systems theory aims to explain the active relationships and interdependence between components of the system and the organization-environment relationships and it focuses on three levels of observations, and these are the environment, the social organization as a system, and human participants within the organization (Lai and Lin, 2017). Since smallholder farmers belong to cooperative societies aimed at accessing both input and output markets, the systems theories can be applied to the cooperative organizations and their environment because their technological environment include the use of digital tools.

The Diffusion of Innovation Theory (DOI)

The Diffusion of Innovation Theory is a theory of technology adoption which was developed using observability, relative advantage, compatibility, and complexity (Rogers, 2006). Ismail (2012) incorporated consumer decisions in the theory of technology adoption using the DOI and showed the connection between a consumer's perceptions of utility and the adoption intentions in utilization of the Apple iPhone. He concluded that if US construction companies could predict the utilization of a new ICT, they could better predict success, total cost of implementation and ownership and complete a more accurate cost-benefit analysis.

The Concept of Value Chain

A value chain are series of activities that are undertaken to bring a product from the initial input-supply stage, through the various phases of processing, to its final market destination, including its disposal after use (UNIDO, 2009). The value chain is a sequence of linked events and processes for conversion of raw materials and resources into products for the market (ADBG, 2013; Smidt and Jokonya, 2022). In order to increase the smallholder farmers' productivity, all the value chain members and the enablers should be activated. The value chain members include the input market partners, the farmer, and the output markets. The enablers are the business environment which include digital solutions.

The Technology Adoption Model (TAM)

The Technology Acceptance Model (TAM) is one of the most leading research models in studies of the determinants of information systems, and information technology (IS/IT) acceptance where perceived usefulness and perceived ease of use are hypothesized and empirically supported as major determinants of user acceptance of a given IS/IT (Chau, 1996). The TAM also focuses on the factors influencing individuals' acceptance and adoption of technology (Sorce and Issa, 2021). Sorce and Issa further agrees with Chau that TAM considers perceived usefulness and perceived ease of use as key determinants of technology adoption, providing a structured framework to understand how and why individuals, in this case, smallholder farmers, might embrace or resist digital solutions in agriculture. The TAM has been adapted in several instances to explain the adoption of technology in the agriculture industry in general and on smallholder farmers in particular (Bontsa et al., 2023; Dong et al., 2022; Fadeyi et al., 2022; Hendrawan et al., 2023; Nyagango et al., 2023; Taheri et al., 2022;

Verma and Sinha, 2018). The TAM can help explore the perceived benefits, challenges, and the overall adoption process within the context of digital solution empowerment for smallholder farmers in Chongwe District. The Value chain concept and the Technology Adoption Model clearly grounds the basis for this research study.

Conceptual Framework

The TAM can help explore the perceived benefits, challenges, and the overall adoption process within the context of digital solution empowerment for smallholder farmers in Chongwe District.

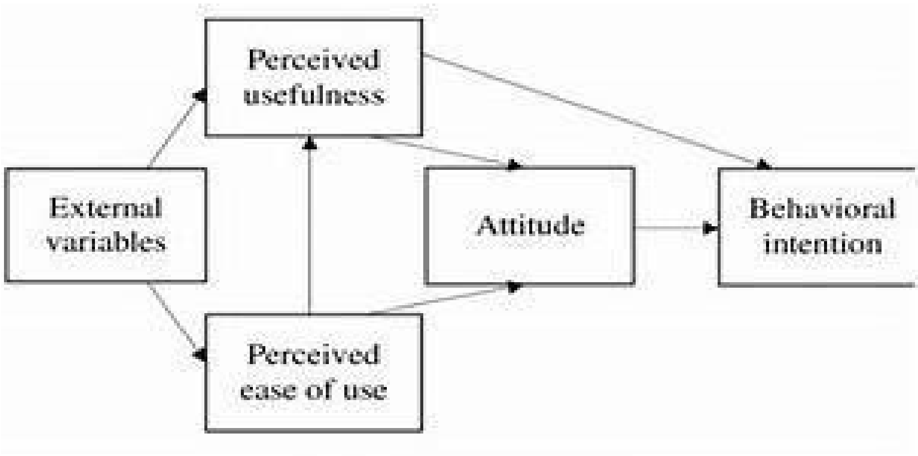

Figure 1: The technology acceptance model (TAM) (Davis et al., 1989, p. 320)

The TAM concept influences the willingness of smallholder farmers to adopt digital solutions (Behavioral intention). The willingness to adopt is directly influenced by the farmers' attitudes towards digital technology and also the benefits of digital solutions (perceived usefulness). The digital solutions benefits are influenced by availability of electricity for mobile phone charging, availability of network and internet connectivity, and ease access to phones (external variables). These external variables influence the perceived challenges of digital solutions such as low digital literacy levels that hinder adoption and use of smart phones (perceived ease of use). The external directly influence both the farmers' attitudes toward the digital solutions and also the benefits they may obtain when they adopt and use digital solutions.

Digital Solutions

Digital Services for Agriculture can be defined as a solution that uses digital equipment and services such as mobile phones, computers, satellites, and sensors to solve agriculture problems (Kieti et al. 2021). Digital solutions comprise of mobile applications (apps) and tools that increase access to timely market price data, financial services, weather predictions, pest outbreaks, and other services (Thompson and Gyatso, 2020, p. 25). Digital solutions play a huge role in agricultural development by making information available at a cost-effective rate, providing access to global best practices and enhancing productivity (Vishwatej et al., 2022).

The Digital Infrastructure

This section discussed mobile phone usage by smallholder farmers, the internet connection and the availability of electricity in rural Sub-Sahara Africa (SSA).

Mobile Phone Usage by Smallholder Farmers in Rural Sub-Sahara Africa (SSA)

During the last decade, mobile phone technologies and usage were rapidly adopted in several developing nations such as Zambia (Aker and Mbiti, 2010; Wesolowski et al., 2012). The mobile phones in developing countries have reduced the costs of communication, improved access to information, and have enabled other technological innovations such as mobile money (Kikulwe et al., 2014). Many studies have shown significant benefits of mobile phones on smallholder farmer households such as improved access to information, lower inputs and marketing costs, hence increased production and profits (Abraham, 2007; Muto and Yamano, 2009), while the indirect benefit is that mobile phones enable other technological innovations such as mobile money transfers, which is very relevant for rural smallholder farming households that are usually underserved by the commercial banks (Kikulwe et al., 2014). Mobile phone in Sub-Saharan Africa is still driving digital transformation and socio-economic advancements (Global System for Mobile Communications [GSMA], 2023).

The internet Connection in Rural SSA

The internet connection is much lower in the majority of SSA countries with cases such as Ethiopia with only 4% of its population accessing the internet (Tsan et al., 2019), while most smallholder farmers have much lower internet connection (Mapiye et al., 2021).

Despite more SSA population accessing internet, smallholder farmers in rural areas have remained disconnected and isolated hence both a huge gender gap and the rural-urban gap which stands at 60% in mobile internet use exist in SSA (Wyrzykowski, 2020). About 40% fewer women are likely to use mobile internet than men in SSA (International Telecommunication Union [ITU], 2020).

The Availability of Electricity for Charging in Rural SSA

In 2009, the rate of access to electricity in Latin America, the Middle East and Developing Asia were 7%, 11% and 19%, respectively (Onyeji et al., 2012). Africa is energy poor, with 80% of Africans with no access to electricity and two-thirds without clean cooking energy (International Energy Agency [IEA], 2023).

The majority of the population in SSA countries have no access to electricity, with smallholder farmers in rural areas being worst hit (Nkwetta et al., 2010). According to the International Energy Agency (International Energy Agency [IEA], 2017), 1.1 billion people in the developing world don't have access to electricity of which 80% are located in rural areas of Sub-Saharan Africa (SSA).

Zambia's national electricity access rate in rural areas is only 4% implying that the majority of the smallholder farmers in Zambia have no access to electricity (Zigah and Creti, 2023).

The Digital Services Available for Smallholder Farmers in Zambia

This section discussed e-agriculture extension, e-banking (mobile money), smallholder farmer's use digital payment platforms, and e-market services.

E-Agricultural Extension Services

Agricultural extension is the backbone rural development in SSA as it is responsible for transmission of agricultural information to smallholder farmers to improve their farming productivity and well-being (Deichmann et al., 2016). The government extension services are an important source of information and advisory services for farmers (Mapiye et al., 2019) despite the top-down approach and many limitations such as lack of support resources and high farmer-to-extension ratio, that has led to its failure to effectively support the smallholder farmers (FAO, 2017).

In the past few decades, the adoption and utilization of digital solutions technologies have been used for agriculture extension services and these digital extension services are widely distributed across the SSA region (Mapiye et al, 2021). Approximately 43 out of 49 SSA countries use digital solutions in agriculture but more than 50 percent of the innovations are headquartered in Kenya (Tsan et al., 2019).

The adoption of digital solutions technology in extension services has helped to reduce poverty among the smallholder farmers in SSA (FAO, 2017; World Bank, 2017; Zyl et al., 2014) because it promotes and quicken interactions between farmers and extension workers, who are government employees working with smallholder farmers to improve their livelihoods and productivity and to share farmer-to-farmer skills and innovations (Mapiye et al., 2021).

Smallholder Farmer's use of Mobile Money

Digital solutions technology promotes the development of e-banking on mobile phones, also known as mobile money in Sub Sahara Africa (Mapiye et al., 2021). Mobile money is a service that allows monetary value to be stored on a mobile phone and sent to other users via text messages (Suri and Jack, 2016).

In Kenya, most smallholder farmers use mobile money to access finance for purchasing farming inputs such as seeds, farm machinery, fertilizer and pesticides (Kirui et al., 2010). In a study done by Suri and Jack (2016) in Kenya, the use of mobile money services reduced extreme poverty in female-headed households by 22% and positively impacted household income of smallholder farmers respectively.

In Zambia, the introduction of mobile money reduced the number of people that don't bank their money and has reduced the rate of employment (Ngoma, 2019, p. 32).

Smallholder Farmers' Access to Mobile Application (Apps)

Scientists and organizations have developed mobile applications to share various crops and livestock information (Mushi et al., 2022). Centre for Coordination of Agricultural Research and Development for Southern Africa [CCARDESA] (2022) identified 18 innovations operational in Zambia were identified out of which 9 were for Zambia only and the remaining 8 were regional innovations. The majority smallholder farmers in Zambia don't use Mobile Application (Apps) because they don't own smartphones on which these Apps can be installed.

The Benefits of Digital Solutions to Smallholder Farmers

Digital solutions facilitate smallholder farming transformation because they facilitate market information and agriculture value chain linkages, improve farm productivity and income, improve access to financial services, improve social well-being and risk minimization, and increase women's empowerment and inclusion (Kudama, et al., 2021). Digital solutions have the capacity to increase productivity and resilience while reducing the vulnerability of smallholder farmers (Quayson et al., 2020). Access to and use of digital solutions could benefit smallholder farmers and farming communities by facilitating access to nutrition and agricultural information, increasing access to financial services, increasing access to insurance to better manage risk, and providing new business opportunities for smallholder farmers (Sekabira et al., 2023). Digital solutions increase weather resilience by providing weather forecasts via SMS messages and mobile applications (Sekabira et al., 2023).

In Nigeria, digital solutions eliminated some roles of middlemen, allowed farmers to expand their markets, enhanced extension and research linkages, and improved the productivity and livelihood of smallholder farmers (Izuogu et al., 2023).

Factors Affecting the Adoption of Digital Solutions Among Smallholder Farmers

There are several factors affecting the adoption of digital solutions by smallholder farmers and some of these are access to extension services (Abdulai, et al., 2023a), poor infrastructure (Izuogu et al., 2023; Smidt & Jokonya, 2022), insufficient electricity

(Anand et al., 2020; Musa et al., 2013; Smidt and Jokonya, 2022), poor internet connectivity, and low access to mobile phones (Kieti et al., 2022; Anand et al., 2020; Abdulai, et al., 2023b), high costs of purchase and maintenance (Izuogu et al., 2023; Kudama, et al., 2021; Mansour, 2023), low education levels (Kieti et al., 2022; Mansour, 2023; Sekabira et al., 2023; Smidt and Jokonya, 2022) and the mistrust caused by scammers (Kieti et al., 2022).

From the literature review conducted, it was evident that most studies about digital technology for smallholder farmers were conducted in West Africa and in East Africa and these studies were mostly desk research papers.

A gap therefore exists in literature and qualitative research justifies a mixed methods research with the objective to assess the digital empowerment of smallholder farmers in Chongwe District by evaluating the existing digital infrastructure, available services, perceived benefits, and challenges, with the aim of providing insights that can inform strategies to enhance the effective integration and utilization of digital solutions in agricultural practices.

Methodology

Introduction

This chapter looked at the research paradigm, research design, sampling methods and sample size, data collection methods, data analysis, validity and reliability, and ethical consideration.

Study Design

The mixed methods research design, using Triangulation Design approach (Creswellet al., 2003) was conducted using interview guides for smallholder farmers and in-depth interviews and key respondents.

Study Site

The study site was Nkomesha agricultural block of Chongwe district in Zambia. Chongwe district is one of the districts of Lusaka province and the other districts are Lusaka, Chilanga, Shibuyunji, Kafue, Rufunsa and Luangwa.

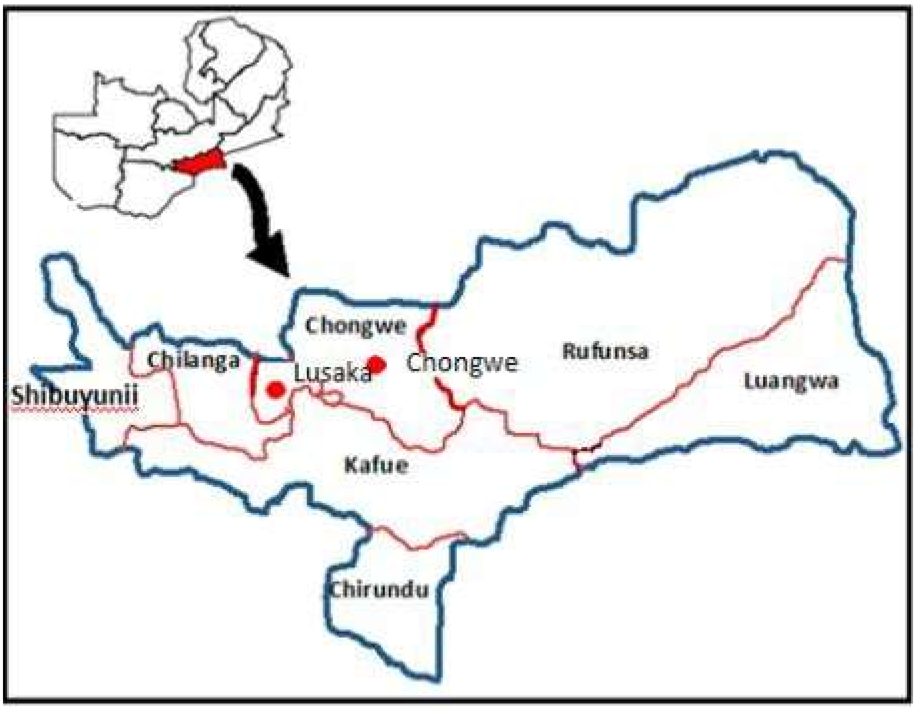

Figure 2: Map of Zambia Showing Chongwe District (Inonge Milupi et al., 2020, p. 23)

Population

The study population was all smallholder farmers in Nkomesha block of Chongwe district in Zambia. In addition, 5 key informants were included in the study. The key informants were the District Agricultural Coordinator, the Camp Extension Officers, the Ministry of Science and Technology officer, the Ministry of Communication officer, and the Food and Agriculture Organization officer. These key informants were important in the study because they had insights due to their experience working with smallholder farmers and their use of digital technology.

Sample Size Determination and Sampling

For the quantitative research component, the study used a multi-stage sampling procedure to select participants for the study. The first stage involved the purposive selection of Chongwe district out six (6) districts of Lusaka province. Chongwe district was selected due to the presence of agricultural technology firms, non-governmental organizations, and government extension offices operating in the district and due to mobile and internet connectivity. In the second stage, Nkomesha block will be selected out the five (5) agricultural blocks in Chongwe districts because it has the most productive smallholder farmers in Chongwe district. Nkomesha block was identified with the help of agricultural extension officers who were employed as field officers. Then 4 agricultural camps (Lwiimba, Kampekete, Lukoshi, and Mwalumina) were randomly selected out of 6 camps in Nkomesha block. In these 4 camps households whose main economic activity was farming were identified and randomly selected.

Finally, Yamane's formula for calculating sample size for a finite population as recommended by Sarmah and Hazarika (2012) was used. To select respondent households, the researcher worked with government extension workers to identify lead farmers, from which farmer registers (sampling frames) were retrieved. Farmers were surveyed at their homes since the study was conducted when farming activities were still going on. The eligibility criteria were that the unit of data collection was only farmers who were 18 years and above. These farmers must have lived in the community during the last farming season in 2022. The total sample size 92 smallholder farmers were randomly selected and interviewed in Nkomesha agricultural block out 693 smallholder farmers that were in farmer registers. Extension officers were recruited as enumerators and were trained to carry out the administration of the interview schedule.

Method used to calculate sample size for smallholder farmers;

Yamane's formula for calculating sample size for a finite population as recommended by (Sarmah and Hazarika, 2012).

Yamane's formula is as follows; n = N/1 + N (e2) where;

n is the sample size,

N is the population = 1,100 (respondents that met the set criteria), and

Assuming 95% confidence level and e is the level of precision = (+/-)10% = 0.1

Using the above formula, the sample size was calculated to be 92.

Thereafter, 92 smallholder farmers were randomly selected and interviewed in Nkomesha agricultural block.

For the qualitative research component, purposive sampling was used to selected key informants for in-depth interviews. The researcher selected 5 key informants using purposive sampling technique (Acharya et al., 2013, p. 4). The key informants included the District Agricultural Coordinators, the Camp Extension Officers, the Ministry of Science and Technology officer, the Ministry of Communication officer, and the Food and Agriculture Organization officer. These key informants were important in the study because they had insights due to their experience working with smallholder farmers and their use of digital technology.

Data Collection

Data was collected using both primary and secondary methods. Secondary data was acquired using desk research from peer reviewed journal articles and a literature review paper was published (Munalula and Qutieshat, 2024). Other secondary sources of data were research reports, government and non-governmental organization reports, and text books. Primary data was collected using both qualitative and quantitative techniques. Descriptive data was collected by administering a semi structured questionnaire to 92 smallholder farmers in the target households. Five key informants were interviewed using an interview guide and qualitative data was collected. The researcher collaborated with 2 Soli speaking local extension officers who worked as research assistants to help with data collection. The assistants received a half day training on how to administer the data collection tools as well as data quality and ethics. The research assistants also participated in a half day pre-testing of the questionnaire session. The questionnaires were validated based on the feedback from pre-testing before data was collected.

Data Management, Processing, and Data Analysis

Survey data collected using questionnaires from the Chongwe district was cleaned by the researcher by verifying for completeness and consistency every day. Respondents whose questionnaires had inconsistent information were revisited to clear the uncertainties. Quantitative data from questionnaires were then entered into the software Statistical Package for Social Sciences (SPSS version 26) and analyzed using descriptive statistics. Qualitative data from in-depth interviews of the District Agricultural Coordinators, the Camp Extension Officers, officers from the Ministry of Science and Technology officer, Ministry of Communication and FAO, was categorized by the thematic content analysis, then comparisons were developed between the coded reports of the software tool NVivo9 and the emerging themes were identified. Microsoft Excel package from Microsoft Office Professional Plus 2017 was used to generate the visual data output formats including pie charts and histograms as presented in Chapter 5 of this paper. The research work employed simple statistical bunch such as tabulation and percentage in presentation of the data.

Validity and Reliability

The researcher implemented a Quality Assurance Plan during all data collection and analysis procedures were as follows:

- Verifying primary and secondary data for correctness and accuracy.
- Liaising with stakeholders to seek clarification on some of the smallholder farmer survey findings.
- Adhering to the ethical guidelines that were consistent with international research practices.
- Ensuring that all the study objectives were met.

Ethical Consideration

The researcher got ethical approval from the University of Zambia's ethical clearance body, University of Zambia Biomedical Research Ethics Committee (UNZABREC) to carry out the study. Permission to conduct the study was also obtained from the offices of the District Agricultural Coordination in Chongwe district to interview the smallholder farmers. The purpose of the study was explained to participants and informed consent was sought. Participants were also informed that they were free to withdraw from the interview at any point without any consequences. The researcher also ensured that only participants who were 18 years and above were interviewed and that they consented to participating in the study. A participatory information sheet was read to each participant explaining their rights and responsibilities to ensure that they had adequate information to make a decision in taking part or otherwise. The participants that agreed to take part in the study were requested to sign an informed consent. Furthermore, participants were assured that the information they would provide would be strictly for academic purposes. Arrangements for interviews with key informants were made prior to the actual day after consent was sought from the concerned participants. After the interview, the researcher thanked the participants who participated in the study.

Research Findings and Data Presentation

Introduction

This chapter presents both quantitative and qualitative data and research findings from in Chongwe district of Zambia.

Data Presentation and Interpretation

The data was organized according to the response rate and the results obtained from the field of study. The data collected through interview guides and in-depth interviews was analysed, presented and interpreted under the following subheading starting with the demographic areas:

Demographic Characteristics of Respondents

Cooperative Membership of Respondents

Table 1shows the respondents' cooperative membership in Chongwe district. The data shows that 92 (100 percent) of respondents were members of cooperatives.

Table 1: Cooperative Membership of Respondents

Name of cooperative		
N	Valid	92
	Missing	0

Gender Segregation of Respondents

Figure 1 shows gender segregation of the respondents. The study revealed that out of 92 respondents, 49 53.3 percent) and 43 (46.7 percent) were female.

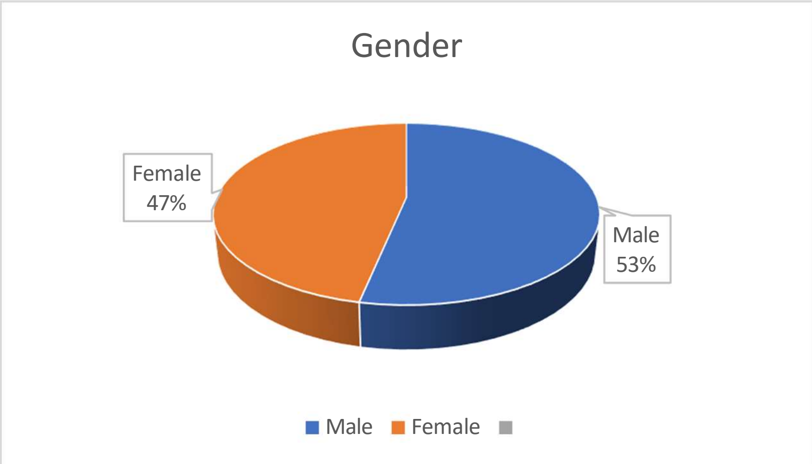

Figure 3: Gender of respondents (Total Sample=92; data obtained using interview guide)

Marital Status of Respondents

Figure 2 shows the marital status of the respondents. The data shows that out of 92 respondents, 76 (72.8 percent) were married, 8 (8.7 percent single or unmarried), 7 (7.6 percent) were divorced, and 10 (10.9 percent) were widowed.

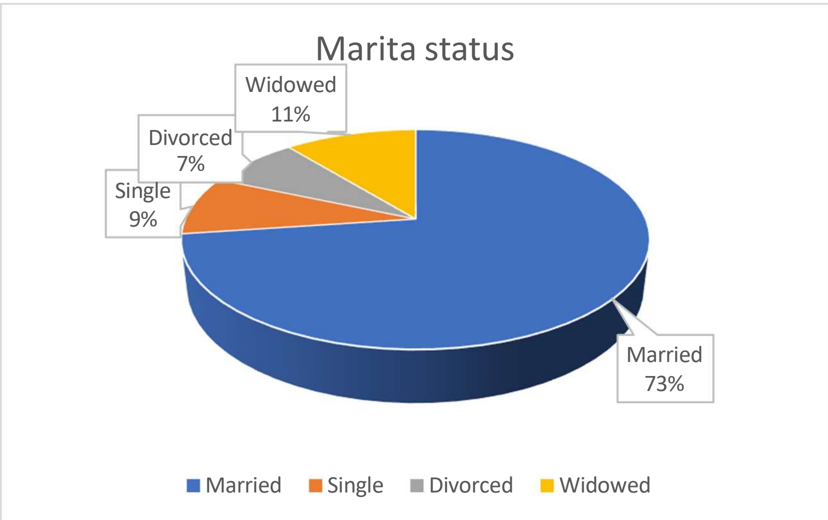

Figure 4: Marital status of respondents (Total Sample=92; data obtained using interview guide)

Education Level of Respondents

Figure 3 shows the level of education attainment of the respondents. The data shows that from 92 respondents, 2 (2.2 percent) did not enter school, 37 (40.2 percent) attained primary education, 50 (54.3 percent) attained secondary education level, and only 3 (3.3 percent) attained tertiary education.

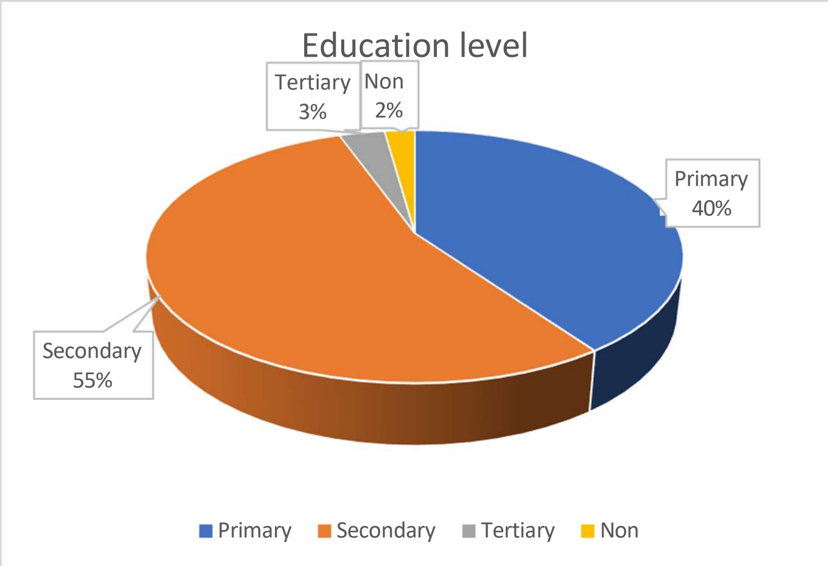

Figure 5: Education level of respondents (Total Sample=92; data obtained using interview guide)

The Digital Infrastructure Available for Smallholder Farmers

Type of a Mobile Phone Smallholder Farmers use

Figure 4 shows the type of a mobile phone used by the respondents. The data shows that out of 92 respondents, 3 (3.3 percent) had no mobile phones. However, 59 (64.1 percent) had ordinary phones while 30 (32.6 percent) had smart phones. This is consistent with literature from the Sub-Sahara Africa that shows rapid adoption of mobile phones in several developing nations (Aker and Mbiti, 2010; Kikulwe, et al., 2014; Wesolowski, et al., 2012).

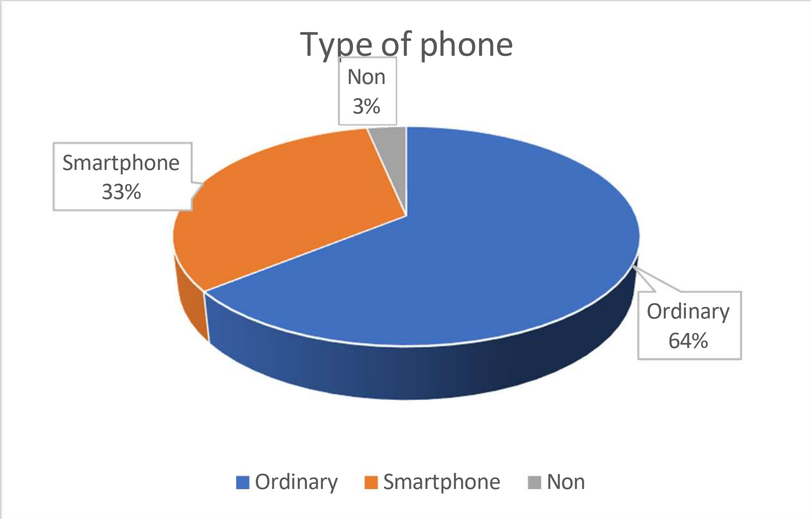

Figure 6: Types of mobile phone (Total Sample=92; data obtained using interview guide)

The Internet Connectivity in Smallholder Farming Areas

Figure 5 shows the internet connectivity of the respondents. The data shows that out of 92 respondents, 55 (59.8 percent) had internet connection, 36 (39.1 percent) did not have internet connection, and 1 (1.1 percent) didn't know whether there was internet connection in the area. This is contrary with literature from the sub-Sahara that shows that the internet connection is much lower in the majority of SSA countries (Mapiye et al., 2021; Tsan et al., 2019).

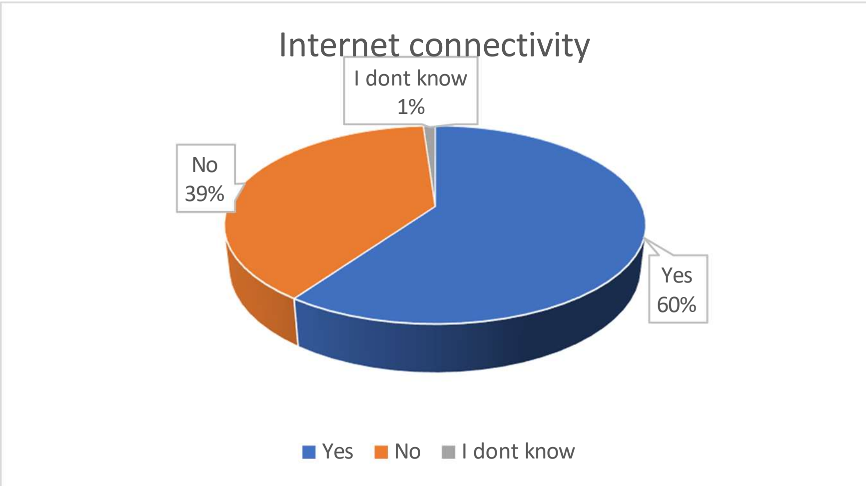

Figure 5: Internet connectivity (Total Sample=92; data obtained using interview guide)

The Availability of Electricity in Smallholder Farming Areas

Figure 6 shows the availability of electricity for the respondents. The data shows that out of 92 respondents, only 2 (2.2 percent) were connected to national electricity grid. This is contrary with literature from the Sub-Sahara Africa which shows that most smallholder farmers' rural areas had a shortage of electricity for disseminating agricultural information (Musa et al., 2013; Okpara, 2011). The smallholder farmers in

Chongwe afford solar powered electricity because of their high productivity compared to the rest of the country. Two in-depth respondents who are experts in agriculture and working with smallholder farmers have confirmed that Chongwe farmers are better in terms of productivity and adoption of digital technology and this due to many projects that are running in Chongwe.

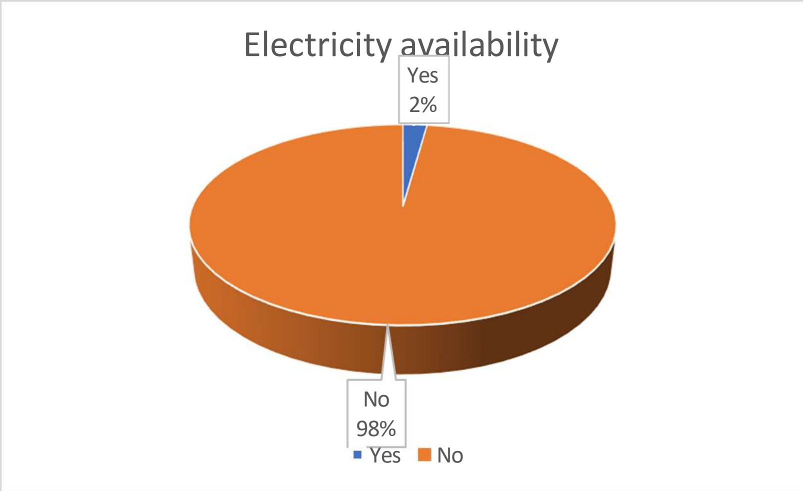

Figure 6: Availability of electricity (Total Sample=92; data obtained using interview guide)

The Phone Charging System for Smallholder Farmers

Figure 7 shows the methods of charging phones for the respondents. The data shows that out of 92 respondents, 87 (95 percent) used solar powered electricity of which 75 (81.5 percent) had access to own solar powered electricity, while 12 (13 percent) accessed the solar power systems from their neighbours.

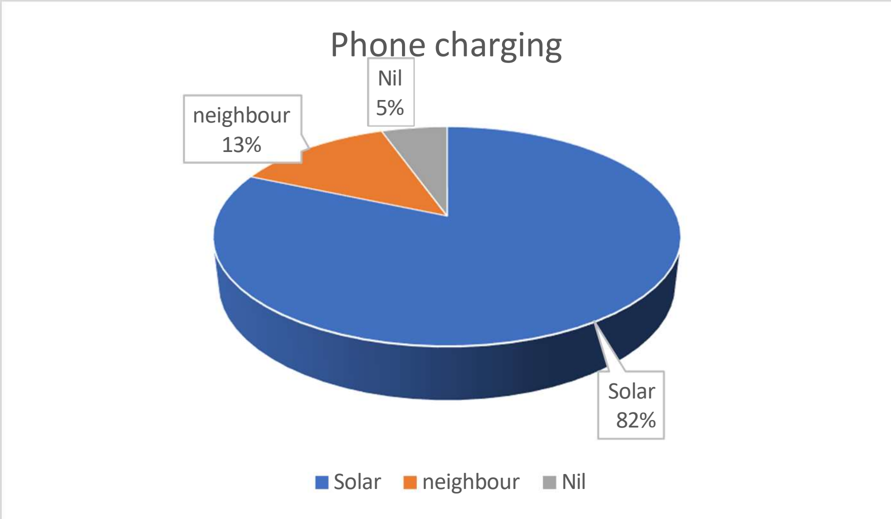

Figure 7: Method used for charging phones (Total Sample=92; data obtained using interview guide)

The Digital Services are Available for Smallholder Farmers

How Smallholder Farmers Receive Extension Services

Figure 8 shows how respondents receive extension services. The data shows that out of 92 respondents who received agriculture extension, 78 (84.8 percent) from agricultural extension workers, 69 (75 percent) through radio, and 43 (46.7 percent) through TV. This is consistent with literature from the sub-Sahara that shows that digital solutions are new ways of providing extension services (Deichmann et al., 2016).

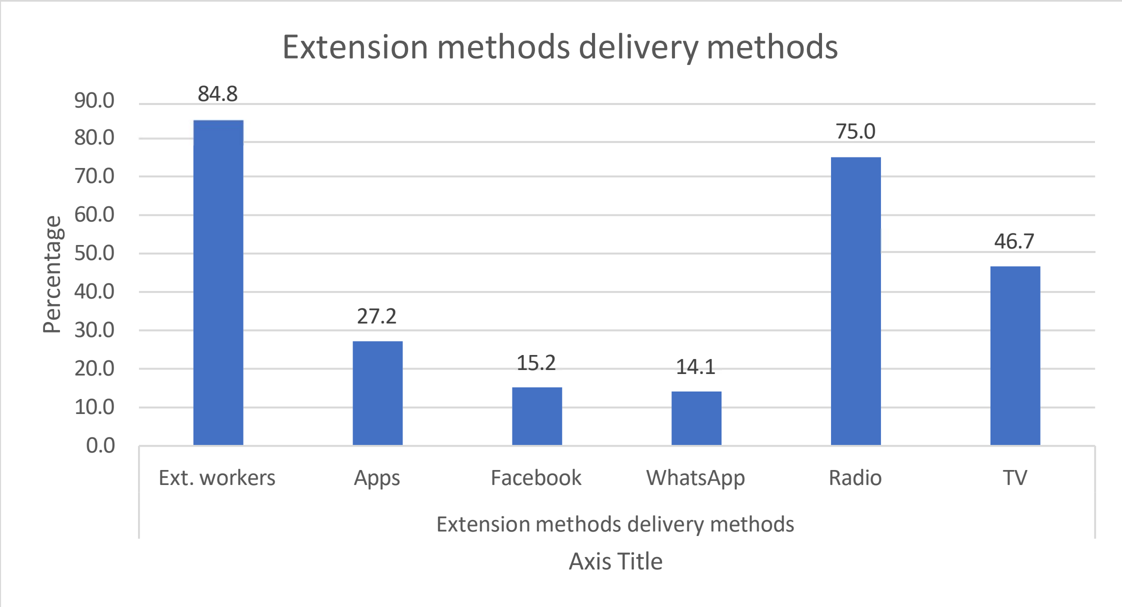

Figure 8: How smallholder farmers receive extension services (Total Sample=92; data obtained using interview guide)

The Digital Services Accessed by Smallholder Farmers

Figure 9 shows digital services accessed by respondents. The data shows that out of 92 respondents, 90 (97.8 percent) smallholder farmers in Chongwe used mobile money. This is consistent with literature from the sub-Sahara that shows that Smallholder farmers in SSA use mobile money services (Agamile, 2022; Quayson et al., 2020).

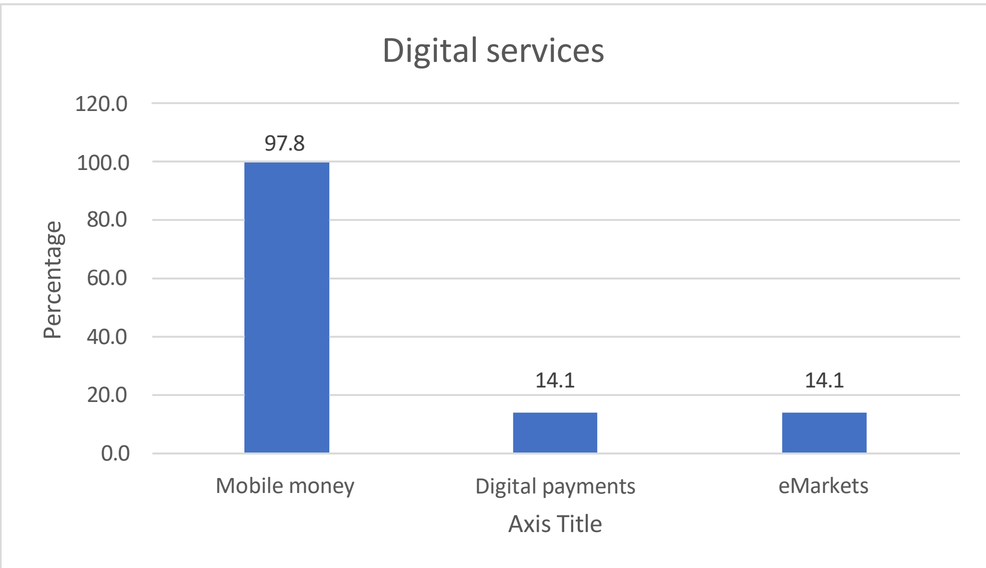

Figure 9: Digital services accessed by smallholder farmers (Total Sample=92; data obtained using interview guide)

Benefits of Digital Solutions to Smallholder Farmers

Figure 10 shows the benefits of digital solutions to respondents. The data shows smallholder farmers' digital solutions benefits. Out of 92 respondents, 91 (98.9 percent) benefited social interactions, 90 (97.8 percent) benefited enhance extension linkages, (96.7) 89 elimination of middlemen, 66 (71.7 percent) benefited access to agriculture information. This consistent with literature which shows that digital solutions facilitate market information and agriculture value chain linkages, improve access to financial services, improve social well-being and risk minimization (Kudama et al.,2021).

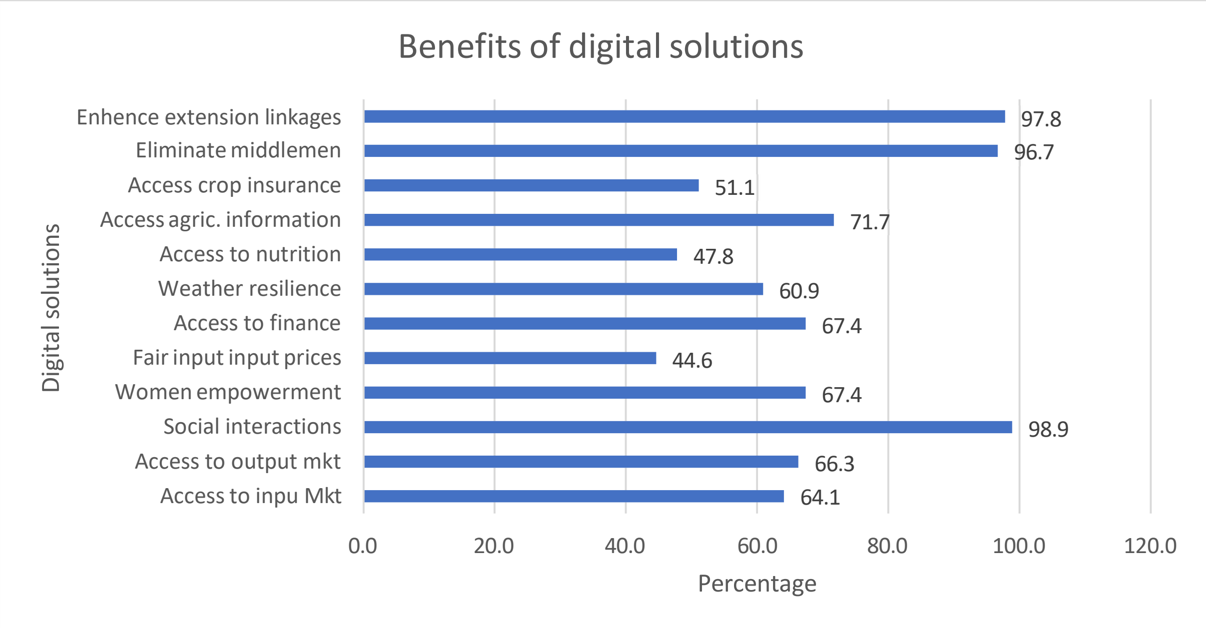

Figure 10: Benefits of digital solutions to smallholder farmers (Total Sample=92; data obtained using interview guide)

The Major Digital Challenges Smallholder Farmers Face

Figure 11 shows the challenges of digital solutions to smallholder farmers. Out of 92 respondents, 87 (94.6 percent) faced challenge of high cost of phones, 83 (90.2 percent) faced challenges of mistrust due to scammers, and 81 (88 percent) faced challenges of high cost of maintenance. This is in line with literature from the sub-Sahara that show challenges of digital solution and these are farmers' digital incompetence, low access to mobile phones (Abdulai, et al., 2023a), lack of technical skill, poor infrastructure, and high costs of purchase and maintenance as digital solution (Izuogu et al., 2023).

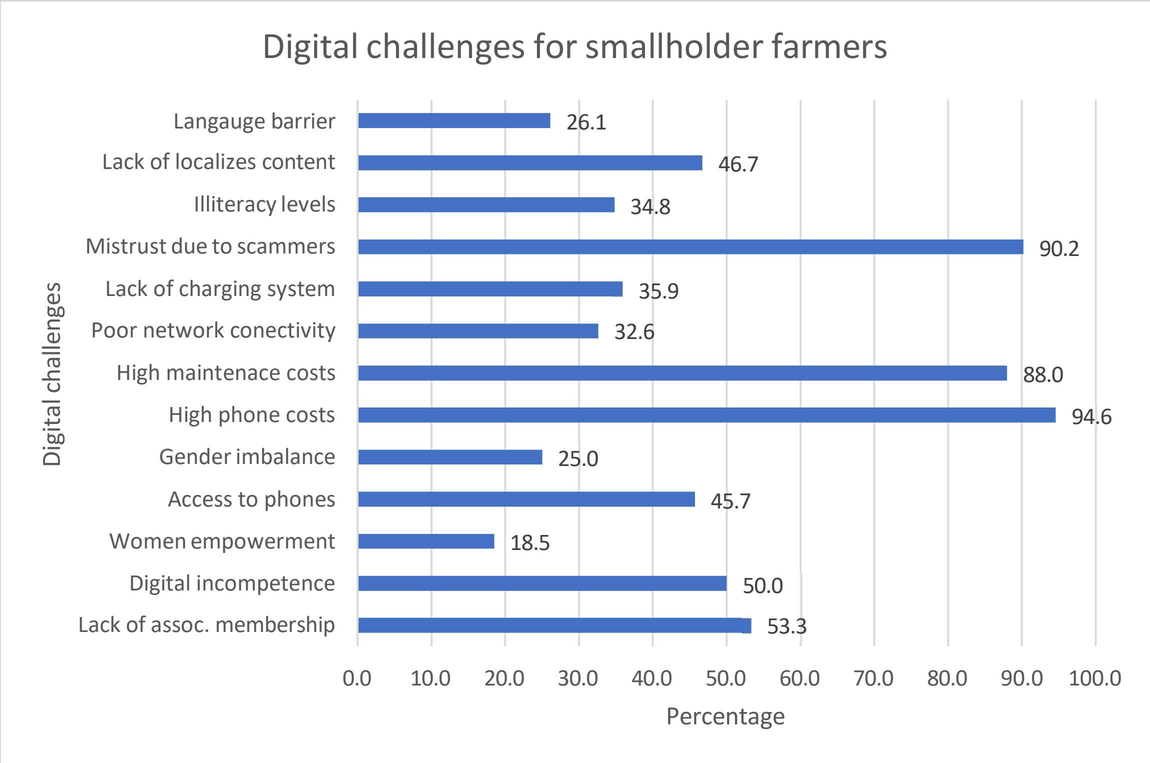

Figure 11: Major digital challenges smallholder farmers face (Total Sample=92; data obtained using interview guide)

Discussion and Interpretation of Results

Introduction

This chapter discusses and interprets results presented earlier in chapter four. The research findings and analysis were structured around the four research questions of the study which was conducted in Chongwe district.

The Digital Infrastructure Available for Smallholder Farmers

The digital infrastructure available for smallholder farmers in Chongwe district was studied under the following sub-headings: mobile phones smallholder farmers use, smallholder farmers' internet connectivity, and the mobile phone charging system. The study revealed the following:

With regards to the type of a mobile phone smallholder farmers use, the study revealed the type of mobile phones smallholder farmers in Chongwe district use. Most of the challenges respondents identified were also reflected in the literature review. Almost all the smallholder farmers in Chongwe district owned mobile phones (94 percent).

However, the majority of the had ordinary phones (64 percent) while 33 percent had smart phones. This is consistent with literature from the sub-Sahara that shows rapidly adoption of mobile phones in several developing nations such as Zambia (Aker and Mbiti, 2010; Kikulwe, et al., 2014; Wesolowski, et al., 2012). The use of smart phones by smallholder farmers is above the country average because of several projects Chongwe enjoys, which exposes them to digital world. During the in-depth interview, Ministry of Agriculture respondent said,

> "I have never worked with serious farmers like these of Chongwe in my fifteen years I worked in Western province…these Chongwe farmers are just something else, maybe it's because of their proximity to Lusaka (The capital city). Chongwe has a lot of projects which these farmers participate."

With regards to the smallholder farmers' internet connectivity in Chongwe district, the study showed that most of the smallholder farmers (60 percent) had internet connection, and only 39 percent didn't have internet connection. This is contrary with literature from the sub-Sahara that shows that the internet connection is much lower in the majority of SSA countries (Mapiye et al., 2021; Tsan et al., 2019). The high internet connectivity in rural Chongwe could be as a result of close proximity to the capital city, Lusaka.

With regards to the availability of electricity for smallholder farmers in Chongwe district, the study showed that most of the smallholder (98 percent) had access to solar powered electricity. This is contrary with literature from the sub-Sahara that shows that most smallholder farmers' rural areas had a shortage of electricity for disseminating agricultural information (Musa et al., 2013; Okpara, 2011). The contradiction with literature is due to the fact that smallholder farmers in Chongwe can afford solar powered electricity because of their high productivity compared to the rest of the country.

With regards to the mobile phone charging system for smallholder farmers in Chongwe district, the study showed that most of the smallholder (98 percent) had access to solar powered charging.

Digital Services Available for Smallholder Farmers

The digital services available for smallholder farmers in Chongwe district was studied.

With regards to smallholder farmers' channels of receiving extension services, the smallholder farmers in Chongwe received agriculture extension mainly from agricultural extension workers (84.8 percent), followed by radio (75 percent), and TV

(46.7 percent). This is consistent with literature from the sub-Sahara that shows that digital solutions are new ways of providing extension services (Deichmann et al., 2016).

With regards to digital services accessed by smallholder farmers in Chongwe, the most used digital services by smallholder farmers in Chongwe was mobile money (97.8 percent), and only few smallholder farmers access digital payments and e- markets (14.1 percent each). This is consistent with literature from the sub-Sahara that shows that Smallholder farmers in SSA use mobile money services (Agamile, 2022; Quayson et al., 2020).

Benefits of Digital Solutions to Smallholder Farmers

With regards to the benefits of digital solutions to smallholder farmers, there are several benefits of digital solutions to smallholder farmers the study found. The most important benefits are social interactions (98.9 percent), enhance extension linkages (97.8 percent), access to agriculture information (71.7 percent) and elimination of middlemen (96.7). These results are consistent with literature from the sub-Sahara that shows that digital solutions facilitate market information, improve farm productivity, improve social well-being and risk minimization (Kudamaet al., 2021).

Major Digital Challenges Smallholder Farmers Face

With regards to the challenges of digital solutions to smallholder farmers in Chongwe district, the study found three main digital challenges faced by smallholder farmers in descending order of importance and these are high cost of phones (94.6 percent), mistrust due to scammers (90.2 percent), and high cost of maintenance (88.0). This is in line with literature from the sub-Sahara that show smallholder farmers' challenges of digital solution as digital incompetence, low access to mobile phones (Abdulai, et al., 2023a), poor infrastructure, and high costs of purchase and maintenance (Izuogu et al., 2023).

Conclusions and Recommendations

Conclusion

With regard to digital infrastructure available for smallholder farmers in Chongwe district, the finding of the study are that 94 percent of smallholder famers in Chongwe district owned mobile phones, of which 64 percent were ordinary phones and 33 percent were smart phones. The use of smart phones by smallholder farmers in Chongwe district was above the country average. This was due to several projects that were being conducted in Chongwe district by different stakeholders and the exposed the smallholder farmers in that area to digital solutions.

The study found that 60 percent of smallholder farmers in Chongwe had internet connection, and is also above average for Sub-Sahara African countries whose internet connection is much lower with countries like Ethiopia having only 4% of its population accessing the internet (Tsan et al., 2019). This high internet connectivity in rural Chongwe could be attributed to the close proximity of Chongwe to the capital city, Lusaka.

The study found that 98 percent of smallholder farmers in Chongwe district had access to solar powered electricity and this above Sub-Sahara average where most smallholder farmers' rural areas had a shortage of electricity (Musa et al., 2013; Okpara, 2011). The high electricity access by smallholder farmers in Chongwe comes from their high productivity coupled with exposure from several stakeholders running projects in the area.

The study also found that 98 percent of smallholder farmers in Chongwe district had access to mobile phone charging systems from solar powered electricity. Most smallholder farmers won solar systems while a few charging their mobile phones at their neighbors.

With regards to digital services available for smallholder farmers in Chongwe district, the research found that 84.8 percent of smallholder farmers in Chongwe received agriculture extension from agricultural extension workers, 75 percent through radio, and 46.7 percent through TV. The study further found that 27.2 percent of smallholder farmers adopted mobile Apps. Social media is ranked the least with 15.2 percent and WhatsApp at 14.1 percent but it's use is likely to grow as literature from the Sub-Sahara that shows that digital solutions are new ways of providing extension services (Deichmann et al., 2016). The study found that the most used digital services by smallholder farmers in Chongwe was e-banking through mobile platforms such as Airtel mobile money, MTNmomo, Zamtel mobile money, Atlas Mara Bank's Tenga mobile money, and Zanaco Express (97.8 percent) just like smallholder farmers in Sub-Sahara Africa who use mobile money services on platforms such as MPESA in Kenya, MTNMOMO in Uganda, Agrikore in Nigeria (Agamile, 2022; Quayson et al., 2020). The fact that smallholder farmers have adopted e-banking as one of digital services available for them, the implication is that the adoption rate for other digital services will continue to increase given the right digital ecosystem.

With regards to the benefits of digital solutions to smallholder farmers, the study shows social interactions (98.9 percent), enhance extension linkages (97.8 percent), and elimination of middlemen (96.7) the most important benefits of digital solutions to smallholder farmers. These results are consistent with literature shows that digital solutions facilitate market information and agriculture value chain linkages, improve farm productivity and income, improve access to financial services, improve social well-being and risk minimization (Kudama et al., 2021).

With regards to the major digital challenges faced by smallholder farmers in Chongwe district, the study found that there were three main digital challenges faced by smallholder farmers and these are high cost of phones (94.6 percent), mistrust due to scammers (90.2 percent), and high cost of maintenance (88.0). These results are consistent with digital solutions challenges in Sub-Sahara Africa (Abdulai, et al., 2023b; Izuogu et al., 2023; Kudama et al., 2021). Unlike the SSA whose smallholder farmers are facing major challenge to the scaling and sustainability of mobile Apps owing to gender imbalance (Mapiye et al., 2021), the major digital challenges faced by smallholder farmers in Chongwe are not women empowerment (18.5 percent), and gender imbalance (25.0 percent). This shows that male smallholder farmers in Chongwe are gender inclusive. This could be attributed again to many projects that these farmers are involved with.

It can be concluded that a good digital ecosystem in Chongwe district is enhancing digital empowerment of smallholder farmers, considering the interplay of digital infrastructure, available digital services, perceived digital benefits, and challenges.

Recommendations

Based on the findings of this study, the following recommendations are made:

The main challenge of digital solution adoption for smallholder farmers is cost of the mobile phones. Therefore, it is recommended that government consider reducing tax on mobile phones to smallholder farmers.

Based on the findings of this study, it is recommended that this research be scaled up in Eastern, Southern and Central Zambia where there is high potential for smallholder production. This because the results for this study is better than SSA average and may not represent the general digital landscape for Zambia. This is due to uniqueness of Chongwe smallholder farmers and it geographical proximity to the capital city, Lusaka.

Further research will be required to target Scientists and organizations that develop mobile applications that are targeting smallholder farmers. This will help to understand challenges and the opportunities for these innovators.

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APPENDICES

Appendix 1: Information Sheet

Purpose of study	To assess the digital empowerment of smallholder farmers in Chongwe District by evaluating the existing digital infrastructure, available services, perceived benefits, and challenges, with the aim of providing insights that can inform strategies to enhance the effective integration and utilization of digital solutions in agricultural practices.
Length of study	6 months
Procedures	Consent for participation will be sought before interviews will be conducted.
Compensation	No compensation because there are no risks for participants
Risks/burdens	There is no risks involved for participants
Benefits/ ancillary care	The farming community will improve its production and profits when they adopt digital solutions in their farming business.

Appendix 2: Consent form

THE UNIVERSITY OF ZAMBIA

BIOMEDICAL RESEARCH ETHICS COMMITTEE

Determining Smallholder Farmers Preparedness for Digital Solutions in Chongwe District

INFORMED CONSENT TEMPLATE FOR INTENDING RESEARCHERS

Digital Empowerment in Agriculture: Evaluating Infrastructure, Services, Benefits, and Challenges for Smallholder Farmers in Chongwe District. I am conducting a research entitled, “Digital Empowerment in Agriculture: Evaluating Infrastructure, Services, Benefits, and Challenges for Smallholder Farmers in Chongwe District.” This is because I want to Assessing the digital empowerment of smallholder farmers in Chongwe District by evaluating the existing digital infrastructure, available services, perceived benefits, and challenges, with the aim of providing insights that can inform strategies to enhance the effective integration and utilization of digital solutions in agricultural practices in Chongwe, Zambia. If you would like, you can be in my study. If you decide you want to be in my study, you will assist to answer the questions which I will be asking you. These questions will enable me collect information on the research topic for further analysis. There are no risks involved in this study, it is also short and not complex. The benefits the study has is that it promotes digital technology adoption which will lead to high farming production and increased profits. Other people will not know if you are in my study. I will mix all information I will learn about with the information from other participants therefore no one can know which information is from you. When I share information about my research, I will not use your name any participant’s name so that no one can know who I will be talking about. My telephone number is 0966434370. You can call me if you have questions about the study or if you decide you don’t want to be in the study any more.

I will give you a copy of this form in case you want to ask questions later.

________________________________ _________________

Signature of Study Participant Date

________________________________ _________________

Signature of Researcher Date

Appendix 3: Data collection tools

Questionnaires

Demographic Questions (helps participants to warm up)

1. Name of smallholder farmer: ……………………………………………………………..
2. Village/Chief/District: ………………………………………………………………
3. Name of cooperative (If any) ....……………………
4. Gender of farmer: ……………………………………………………………
5. Marital Status: ……………………………………………………………………
6. Number of Children: ……………………………………………………………
7. Mobile Number (s): ……………………………………………………………
7. Level of education: (a) Primary (b) Secondary (c) Tertiary (e) None

Section B

10. What type of a mobile phone do you use? (a) ordinary (b) smart phone (c) non
11. Is internet connection available in your area? (a) Yes (b) No (c) I don't know
12. Is there available electricity in your area? (a) Yes (b) No
13. If No, how do you change your phone?...
14. How do you receive agricultural extension services? (Please tick (√) where appropriate)

Extension Delivery Methods	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
Extension officers					
Through Mobile Applications.					
Through Facebook					
Through WhatsApp.					
Through Radio.					
Through Television					

15. What digital services do you access? (Please tick (√) where appropriate)

Digital Services used SHFs	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
Mobile money					

digital payment platforms					
E-markets					

16. What are other digital services you access?..

17. What are the benefits of digital solution to you? (Please tick (√) where appropriate)

Benefits of Digital Solution	**Strongly Agree**	**Agree**	**Unsure**	**Disagree**	**Strongly Disagree**
Access to input markets					
Access to output markets					
Social interaction					
Women empowerment					
Fair input prices					
Access to financial services					
Weather resilience					
Access to nutrition					
Access to agricultural information					
access to insurance					
eliminated some roles of middlemen					
enhanced extension linkages					

18. What are the major digital challenges you face? (Please tick (√) where appropriate)

Digital Challenges Smallholder Farmers	**Strongly Agree**	**Agree**	**Unsure**	**Disagree**	**Strongly Disagree**
lack of membership in associations					

poor access to extension services					
digital incompetence in placing phone calls,					
Low access to mobile phones					
Gender imbalance					
High costs of mobile phones					
High costs of maintenance					
Poor network connectivity					
Lack of Charging system					
mistrust caused by scammers					
low literacy levels					
localized content in local languages					
language barrier					

-End of Interview-

In-Depth Interview Guide

Demographic Questions (helps participants to warm up)

1. Name of Officer: ……………………………………………………………………
2. Position: ……………………………………………………………………………….
3. Gender: …………………………………………………………………………..........
4. Mobile Number: ……………………………………………………………………
7. Highest level of education: (a) Diploma (b) Bachelors (c) Masters (d) PhD

8. How long have you worked in the Ministry of Agriculture?.......................................

Qualitative methods In-depth Interview Question (To explore participants' general views towards Digital technology and reflect the interpersonal and personal meanings about digital technology for stallholder farmers).

11. How do you describe the importance of digital technology in your work with smallholder farmers in Chongwe?

Qualitative methods In-depth Interview Question (To explore the digital technology context usage of extension workers and to let them describe their recent usage experience of digital tools and reflect the interpersonal and personal meanings about digital technology).

12. What digital technology did you use during your recent interaction with smallholder farmers in Chongwe?

13. How do you describe the reception of your message by smallholder farmers when you used digital technology the relay the message?

14. What do you think should be done to improve reception of digitally channeled message to smallholder farmers?

15. What digital tools are your smallholder famers have access to?

Qualitative methods In-depth Interview Question (To discuss digital technology usage by small-scale farmers).

17. What are your beliefs about the digital technology adoption by smallholder farmers?

18. What are your feelings about the impact of digital technology on smallholder farmers yield and profits?

19. What are your digital technology expectations on smallholder farmers?

20. What could be your reasons for not adopting digital technology?

21. Describe your recent experience of digital technology failures on smallholder farmers?

-End of Interview-

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The Role of Coping Self-Efficacy, Social Support, and Loneliness on Acculturative Stress and Life Satisfaction Among Brazilians in Ireland.

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Abstract

The mental health of migrants is a complex issue influenced by various factors, including acculturative stress, social support systems, coping mechanisms, and individual resilience. This study investigated the mental health experiences of Brazilian migrants in Ireland (N = 96; 75% female), focusing on the interplay of acculturative stress, social support, coping mechanisms, loneliness, and life satisfaction. This is a quantitative study with correlational design employed, with data collected through an online questionnaire comprising demographic questions and five psychometric scales: Satisfaction with Life Scale (SWLS), Acculturative Stress Scale for International Students (ASSIS), Coping Self-Efficacy Scale (CSES), UCLA Loneliness Scale (ULS-10), and Multidimensional Scale of Perceived Social Support (MSPSS). The results revealed that longer time spent in Ireland was associated with decreased acculturative stress and increased life satisfaction. Additionally, coping self-efficacy, perceived social support, and time spent in Ireland positively correlated with life satisfaction, while loneliness negatively correlated with coping self-efficacy. The study also found that social support, coping self-efficacy, and time in Ireland were positive predictors of life satisfaction, whereas acculturative stress and loneliness were negative predictors. These findings underscore the crucial role of *social support, coping skills, and addressing loneliness and acculturative stress in promoting the well-being of Brazilian migrants in Ireland. Future research could delve into the specific coping strategies employed by this population and the influence of cultural factors on their acculturation process.*

Key words: Acculturation, Coping Skills, Life Skills, Self-Efficacy, Cross-Cultural Psychology, Life Satisfaction, Mental Health, Migration, Social Support.

Introduction

In the 1990s, Ireland experienced a period of rapid economic growth, known as the "Celtic Tiger" (Sweeney, 2000). This economic boom attracted a wave of migrants seeking employment opportunities, including a significant number of Brazilians (Carlson and Nilsen, 1995; Carta et al., 2005; Sweeney, 2008). The influx of Brazilian migrants continued into the early 2000s, with many drawn to Ireland for English language courses and university programs (Carta et al., 2005; Maher and Cawley, 2014, 2015), which in fact, Brazilians became the second-largest international student population in the country (Study International Staff, 2016; CSO, 2018, 2022). Over time, a portion of these migrants have become Irish citizens (Maher and Cawley, 2014, 2015). Despite this growing presence, research on the mental health experiences of migrants in Ireland remains limited, particularly in the context of the significant social and cultural adjustments they face. Carta et al. (2005) criticise the existing literature on migrant mental health as being scarce and often focused on broader European contexts, thereby neglecting the unique experiences of specific migrant groups in different countries, such as Brazilians in Ireland.

The mental health of migrants is a complex issue influenced by various factors, including acculturative stress, social support systems, coping mechanisms, and individual resilience (Carta et al., 2005; Giacco, Laxhman and Priebe, 2018; Hasan et al., 2021). Acculturative stress, the psychological strain associated with adapting to a new culture, can significantly impact mental well-being (Sandhu and Asrabadi, 1994; Berry, 1997, 2005; Bhugra, 2004). However, the existing research on acculturative stress among migrants in Ireland is limited, and the specific stressors they face in the Irish context remain under-explored.

Social support and integration into the host society have been identified as crucial protective factors against mental health challenges in diverse migrant populations (Priebe et al., 2013; Priebe, Giacco and El-Nagib, 2016; WHO, 2018). However, the literature on social support among migrants in Ireland is underdeveloped, and the role of social networks and community resources in their mental health adaptation remains unclear. Additionally, the impact of migration pathways, such as student visas or work permits, on social integration and mental health outcomes among migrants in Ireland has not been adequately investigated.

While several studies have linked high rates of depression, suicidal thoughts, drug abuse, and alcoholism among migrants to social integration and adaptation difficulties (Giannopoulou, 1988; Akbiyik, 1990; Bendahman, 1993; Yahyaoui, 1992; Yakoub, 1993; Sandhu and Asrabadi, 1994; Boylan, 1995; Bhugra and

Ayonrinde, 2004; Berry, 2005; Carta et al., 2005; Priebe, Giacco and El-Nagib, 2016; Giacco, Laxhman and Priebe, 2018; Hasan et al., 2021), these studies often lack a nuanced understanding of the specific challenges faced by different ethnic groups of migrants in Ireland. Furthermore, the research on the mental health of migrant in Ireland is limited, and the impact of factors such as working conditions, financial stress, and discrimination on their mental well-being remain under-investigated, as underscored by Villarroel et al. (2019) and Cronin et al. (2024), there is a lack of research on frameworks for collaborative action, advocacy and human rights, and improving health information systems for migrants in Ireland.

This study aims to address these gaps in the literature by investigating the mental health experiences of a portion of the ethnic group of Brazilian migrants in Ireland, with a specific focus on the interplay of acculturative stress, social support, coping mechanisms, and loneliness. By examining these factors in the context of the unique experiences of Brazilian migrants in Ireland, this study will contribute to a more comprehensive understanding of migrant mental health and inform the development of targeted interventions and support services.

Acculturative Stress

Acculturation, explained by Ward and Geeraert (2016), is a complex process that occurs when individuals from different cultures come into contact with each other. It involves changes in an individual's values, behaviours, and identity as they adapt to the new cultural context (Matsumoto and Juang, 2012). Acculturative stress arises when individuals experience difficulties in navigating these changes and adapting to the new culture (Berry, 1980, 1992, 1997, 2005; Bhugra, 2004). Abbott et al. (1999), Tseng (2001) and Bhugra (2004) agree this stress can manifest in various ways, including psychological distress, physical symptoms, and social difficulties.

Several factors can contribute to acculturative stress, including language barriers, discrimination, social isolation, and the loss of social support networks, as highlighted by a number of researchers (Sandhu and Asrabadi, 1994; Ruspini et al., 2000; Bhugra, 2004; Furnham, 2004; Carta et al., 2005; Wong and Wong, 2006; Ward and Geeraert, 2016). The degree of cultural distance between the individual's heritage culture and the host culture can also play a significant role (Sandhu and Asrabadi, 1994; Ward and Geeraert, 2016). For example, Brazilians, who come from a collectivist culture, may experience greater acculturative stress when adapting to Ireland that is considered a relatively individualistic culture (Singelis, 1994; Bhugra, 2004; Wong and Wong, 2006). Ireland generally scores higher on individualism behaviour, being relatively close to scores in the same as the US and the UK when compared among collectivist societies on Hofstede’s framework for assessing cultural dimensions (Hofstede, 2001; Kulkarni et al., 2010; Connolly, Lang and Wall, 2019). However, much of the existing research on human behaviour and acculturative stress has focused on migrants in North America and other Western countries, with limited attention given to the experiences of migrants in Ireland (Arnett, 2008; Matsumoto and Juang, 2012; Henrich, Heine and Norenzayan, 2020).

This study aims to address these limitations by examining acculturative stress among Brazilian migrants in Ireland using a quantitative approach. By focusing on a specific migrant group in a specific context, this study will contribute to a more nuanced understanding of acculturative stress and its impact on mental health.

Social Support and Integration

Social support and integration into the host society are crucial factors in mitigating the negative effects of acculturative stress and promoting mental well-being among migrants (Priebe et al., 2013; Ottisova et al., 2016; Priebe, Giacco and El-Nagib, 2016; Giacco, Laxhman and Priebe, 2018; Porter and Haslam, 2018). Priebe et al. (2013), Priebe, Giacco and El-Nagib (2016) and World Health Organization (WHO, 2018) suggest that social support can provide a sense of belonging, emotional support, and practical assistance, all of which can help individuals cope with the challenges of adapting to a new culture.

For WHO (2018) integration into the host society involves developing social connections, participating in community activities, and adopting aspects of the new culture. Several studies recommend that this process can be facilitated by language proficiency, employment opportunities, and supportive social policies (Beirens et al., 2007; IASC, 2007; Spencer, 2006; Betts and Collier, 2017; El-Awad et al., 2017; Adityavarman et al., 2021). Previous research has shown that migrants who are well-integrated into the host society tend to have better mental health outcomes than those who are socially isolated (Ruspini et al., 2000; Bhugra and Jones, 2001; Bhugra, 2004; Bhugra and Ayonrinde, 2004; Lee, Koeske and Sales, 2004; Carta et al., 2005; Priebe et al., 2013; Bogic, Njoku and Priebe, 2015; Priebe, Giacco and El-Nagib, 2016). However, existing research on social support and integration among migrants has often overlooked the role of cultural factors in shaping social networks and support systems. Additionally, previous studies have tended to focus on the quantity of social support rather than the quality, which may be a more important predictor of mental health outcomes.

This study will address these limitations by examining the role of cultural factors in shaping social support and integration among Brazilian migrants in Ireland. The study will also assess both the quantity and quality of social support to gain a more comprehensive understanding of how social support influences mental health in this population.

Migration and Mental Health

The relationship between migration and mental health is complex and multifaceted as explained in previous sections. While migration can offer opportunities for personal growth and improved quality of life, it can also pose significant challenges to mental well-being. The stress of adapting to a new culture, coupled with the loss of familiar social support networks, can increase the risk of mental health problems among migrants.

Studies have shown that migrants are at a higher risk of developing various mental health disorders, including depression, anxiety, and post-traumatic stress disorder (PTSD) (Carta et al., 2005; Giacco, Matanov and Priebe, 2014; World Health

Organization, 2018; Hasan et al., 2021). Tseng (2001) and Bhugra (2004) underscore the prevalence of these disorders can vary depending on factors such as the reason for migration, pre-migration experiences, and post-migration stressors, as also highlights by many other scholars (Achotegui, 2002; Carta et al., 2005; Hasan et al., 2021). However, much of the existing research on migrant mental health has focused on refugees and asylum seekers, with less attention given to the experiences of economic migrants. Additionally, many previous studies have often relied on clinical samples (Janca and Helzer, 1992; Furnham, 2004; Cantor-Graae and Selten, 2005; Fazel, Wheeler and Danesh, 2005; Lindert et al., 2008; Bogic, Njoku and Priebe, 2015; Close et al., 2016; Hollander et al., 2016), which may not be representative of the broader migrant population.

This study will address these limitations by focusing on the mental health experiences of Brazilian migrants in Ireland, who are primarily economic migrants. The study will use a community sample that is more generalizable to the population of Brazilian migrants in Ireland, however it also presents a limitation of generalization to the broader population of migrants. Additionally, the study will examine a range of mental health outcomes by self-report measures, including both clinical and subclinical levels of distress, to capture a wider spectrum of mental health experiences among this population.

Research Questions and Hypotheses

This study aims to investigate the mental health experiences of Brazilian migrants in Ireland, with a specific focus on the interplay of acculturative stress, social support, coping mechanisms, loneliness, and life satisfaction. The research questions and hypotheses guiding this study are:

(1) **How does the duration of time living in Ireland influence the levels of acculturative stress and life satisfaction among Brazilian migrants?**

H1: It is hypothesized that those who have lived in Ireland for a longer duration will experience lower levels of acculturative stress.

H2: It is hypothesized that those who have lived in Ireland for a longer duration will experience higher levels of life satisfaction.

(2) **Does migrating alone or accompanied affect the levels of loneliness and coping self-efficacy in Brazilian migrants?**

H3: It is hypothesized that those who migrated alone will experience higher levels of loneliness.

H4: It is hypothesized that those who migrated alone will experience lower levels of coping self-efficacy.

(3) **What is the relationship between coping self-efficacy, perceived social support, time in Ireland, and life satisfaction among Brazilian migrants?**

H5: It is hypothesized that coping self-efficacy and perceived social support will be positively correlated with life satisfaction.

(4) **Does loneliness significantly impact the coping self-efficacy of Brazilian migrants?**

H6: It is hypothesized that loneliness will negatively predict coping self-efficacy.

(5) **How do social support, coping self-efficacy, acculturative stress, and loneliness collectively influence the life satisfaction of Brazilian migrants in Ireland?**
H7: It is hypothesized that social support and coping self-efficacy will positively predict life satisfaction, while acculturative stress and loneliness will negatively predict life satisfaction.

By addressing these questions, this study seeks to provide a comprehensive understanding of the factors that contribute to the mental health and well-being of Brazilian migrants in Ireland. The findings of this research will not only contribute to the existing body of knowledge on migrant mental health but also inform the development of targeted interventions and support services to enhance the well-being of this growing population.

Methodology

Participants

The target population for this study was Brazilian migrants residing in Ireland who met the following criteria: (1) had been a student within the previous five years; (2) were at least 18 years old; and (3) had at least an intermediate level of English to understand and answer the questionnaire. These criteria were chosen to ensure that participants had recent experience with the acculturation process and could comprehend the survey questions. The final sample consisted of 96 participants, with 72 females (75%) and 24 males (25%). Participants' ages ranged from 19 to 59, with a mean age of 33.51 (SD = 6.41).

Due to the challenges associated with accessing a geographically dispersed and potentially hidden population, a non-probability sampling approach was employed, using both convenience and snowball sampling methods. Convenience sampling was through readily available channels, such as social media platforms and personal networks. Snowball sampling entailed participants sharing the survey link with other potential participants within their social circles. While the study did not collect information of where participants lived in Ireland, it is likely that most were from the Dublin area, as that is where the survey was mainly promoted.

Design

This study employed a correlational and cross-sectional design to explore the associations between coping self-efficacy, social support, loneliness, acculturative stress, and life satisfaction among Brazilian migrants in Ireland and to examine differences amongst this sample. The study considered demographic factors such as gender, migration group (alone or accompanied), and community connection as independent variables. The primary dependent variables of interest were life satisfaction, acculturative stress, coping self-efficacy, loneliness, and social support. The study further investigated specific hypotheses using regression analyses, which in one analysis, loneliness was considered the independent variable, and coping self-efficacy was the dependent variable. In another analysis, social support, coping self-efficacy, acculturative stress, and loneliness were treated as independent variables to predict life satisfaction, which served as the dependent variable.

Materials

The online survey was created using Google Forms used for data collection. Upon completion, the data were downloaded into Microsoft Excel for initial organization and then imported into IBM SPSS Statistics 26.0 for statistical analysis.

The questionnaire comprised 109 questions across eight sections. The initial two sections were divided into research information, contact details for the researcher and supervisor, debrief of potential risks, anonymity, confidentiality and voluntary participation, right to withdrawal, and emergency support services. All information was included to ensure participants' well-being, informed consent and ethical considerations in accordance with Dublin Business School Ethical guidelines and Psychological Society of Ireland (PSI).

The third section collected demographic data, including gender, age, time living in Ireland, existing migration history, English proficiency, current employment and education status, social connections, and future plans in Ireland.

The remaining five sections of the questionnaire consisted of psychometric scales designed to measure the following constructs: (1) **Satisfaction with Life Scale (SWLS):** this 5-item scale assesses overall life satisfaction, with higher scores indicating greater satisfaction (Diener et al., 1985). The SWLS has demonstrated strong internal consistency according to Cronbach's alpha ($\alpha = .87$) in previous research; (2) **Acculturative Stress Scale for International Students (ASSIS):** this 36-item scale measures various dimensions of acculturative stress experienced by international students, including perceived discrimination, homesickness, perceived hate, fear, stress due to change/culture, guilt, and miscellaneous concerns (Sandhu and Asrabadi, 1994). The ASSIS has shown high reliability ($\alpha = .96$) in previous studies. (3) **Coping Self-Efficacy Scale (CSES):** this 26-item scale assesses an individual's confidence in their ability to cope with life's challenges (Chesney et al., 2006). It comprises three subscales: problem-focused coping, stopping negative emotions and thoughts, and getting social support. The CSES has demonstrated good internal consistency and structural validity in previous research (subscale problem-focused coping 6 items, $\alpha = .91$, stopping negative emotions and thoughts with 4 items, $\alpha = .91$, and social support with 3 items, $\alpha = .80$); (4) **UCLA Loneliness Scale (ULS-10):** this 10-item shortened version of the UCLA Loneliness Scale measures self-perceived loneliness and social isolation (Russell, 1996). Higher scores on the ULS-10 indicate greater loneliness. The scale has shown good test-retest reliability ($\alpha = .73$) and internal consistency ($\alpha = .89 – .94$) in previous research; (5) **Multidimensional Scale of Perceived Social Support (MSPSS):** this 12-item scale assesses perceived social support from three sources: significant others, family, and friends (Zimet et al., 1988). Higher scores on the MSPSS indicate greater perceived social support. The scale has demonstrated good internal consistency reliability and moderate construct validity in previous research (α = .85 to .91 for the overall scale and its three subscales). All five scale instruments are made freely available and widely accessible through the internet, therefore the researcher was exempted from the authors' permissions to use the instruments.

Ethics

Ethical approval for this study was granted by the Dublin Business School Research Ethics Committee. The research adhered to the ethical guidelines set forth by the Psychological Society of Ireland (PSI) and the British Psychological Society (BPS). These guidelines emphasize respect for the rights and dignity of participants, competence in research conduct, responsibility for participant well-being, and integrity in data collection and reporting.

The information sheet and debriefing materials provided to participants clearly outlined the purpose of the study, emphasizing that it was being conducted as part of an undergraduate assessment. Anonymity was ensured through the use of online survey tools that did not track participant identities, such as IP addresses, name, phone or email details. All data and survey content were securely stored on password-protected computers and Google accounts with two-step verification.

Throughout the research process, no ethical issues were encountered. The researcher maintained open communication with potential participants, addressing any concerns that arose promptly and respectfully. The study's commitment to ethical principles ensures the protection of participant rights and the integrity of the research findings.

Procedure

Following ethical approval from the Dublin Business School Research Ethics Committee and DBS Psychology Filter Ethics Committee, participants were invited to participate in the study through various channels. Social media platforms were used to disseminate a direct link to the online survey, and printed posters with QR code were displayed in public spaces and English language schools attended by Brazilian students. This multifaceted recruitment strategy aimed to maximize the reach and accessibility of the survey.

The survey was accessible online from December 2022 to February 2023, allowing for data collection over an extended period. Upon accessing the survey, participants were presented with an information sheet detailing the study's purpose, eligibility criteria, voluntary nature of participation, anonymity, and the right to withdraw at any time. Informed consent was obtained before participants proceeded to the questionnaire.

After completing all sections, participants received a confirmation message expressing gratitude for their participation and reiterating contact information for the researcher, supervisor, and emergency support services. Upon completion of the data collection phase, the data were exported from Google Forms into

Microsoft Excel 2021 for initial organization and cleaning. Subsequently, the data were imported into IBM SPSS Statistics 26.0 for in-depth statistical analysis.

Results

Descriptive Statistics

Descriptive statistics in relation to the sample

The study sample consisted of 96 participants, with a majority of females (N = 72, 75%) and a minority of males (N = 24, 25%). The age range was 19 to 59, with a mean age of 33.51 years (SD = 6.41). Participants were divided into three groups based on their time living in Ireland (Figure 1): "up to two years" (N = 22, 23%), "between three to five years" (N = 35, 35%), and "more than five years" (N = 39, 41%). This distribution suggests a diverse sample in terms of duration of stay in Ireland, with a majority reporting to be in the country for more than three years (77%), allowing potential comparisons between those who are relatively new to the country and those who have been living there for a longer period.

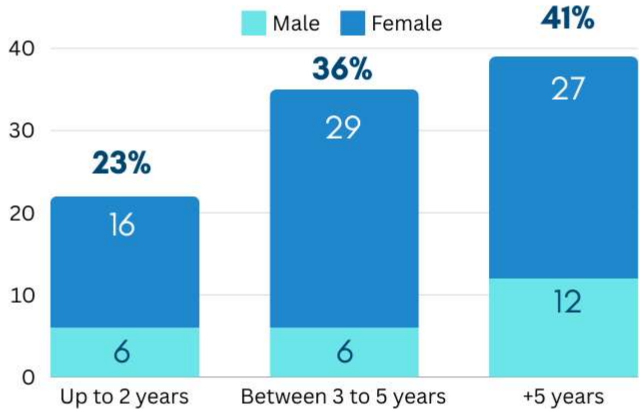

Figure 1: Distribution of Participants per Gender and Time Living in Ireland Groups.

Regarding migration patterns (Figure 2), most participants migrated alone (N = 52, 54%), followed by those who migrated with an intimate partner or intimate partner and their children (N = 34, 35%). Smaller proportions migrated with siblings (N = 5, 5%) or a close friend or other (N = 5, 5%). Notably, no participant migrated solely with children. This distribution highlights the prevalence of solo migration and migration with intimate partners among Brazilians in Ireland.

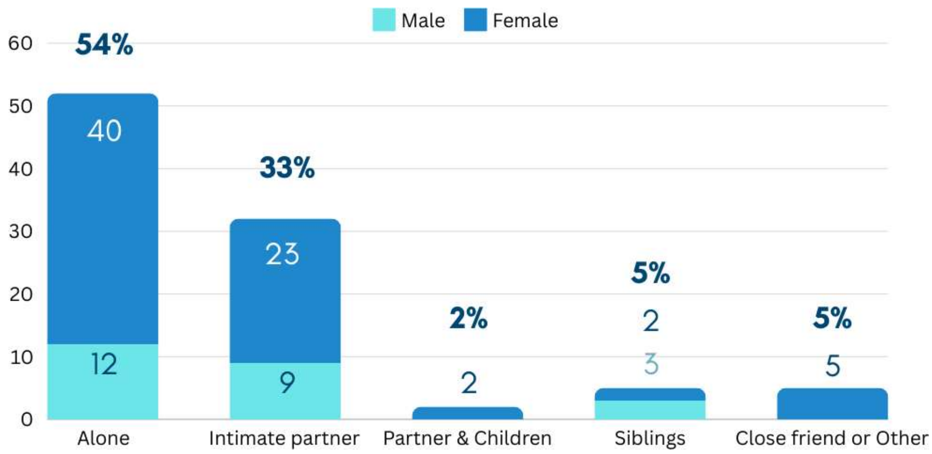

Figure 2: Distribution of Participants per Gender and Migration Group.

The majority of participants reported having connections, in different levels, with a Brazilian community in Ireland (Figure 3), indicating a significant level of social integration within their ethnic group. Among those connected, most reported being connected with 6 to 10 people (N = 35, 37%), followed by those connected with more than 20 people (N = 23, 24%), with less than 5 people (N = 21, 22%), 11 to 20 people (N = 16, 17%), and zero connections (N = 1, 1%). This suggests that while most participants maintain social ties within the Brazilian community, the size and intensity of these connections vary.

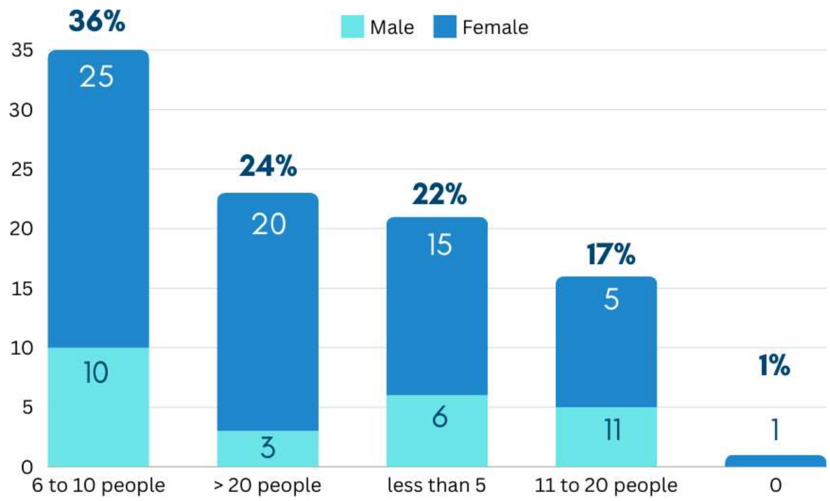

Figure 3: Distribution of Participants per Gender and Community Connections

In terms of employment and education, 58% (N = 56) of participants were not currently studying, while 42% (N = 40) were. Among those studying, the average self-reported study time per week was 8 hours (N = 96, M = 7.61, SD = 11.19), ranging from 2 to 40 hours. The majority of participants were currently working (N = 85, 88%), with an average self-reported work week of 31 hours (M = 31.01, SD = 13.76), ranging from 15 to 60 hours (See Table 1). These findings suggest that a substantial proportion of Brazilian migrants in Ireland are engaged in both educational pursuits and employment, potentially reflecting their efforts to establish themselves in the country.

Table 1: Descriptive Statistics for Studying in Ireland, Studying Hours per Week, Working in Ireland, and Working Hours per Week, n = 96

Variables	N	%	Min.	Max.	Mean	St. Deviation
Are you currently studying in Ireland?						
Yes	40	42 %	-	-	-	-
No	56	58 %	-	-	-	-
How many hours do you study per week?	-	-	2	40	7.61	11.19
Are you currently working in Ireland?						
Yes	85	88 %	-	-	-	-
No	11	12 %	-	-	-	-
How many hours do you work per week?	-	-	0	60	31.01	13.76

Regarding future plans, most participants (N = 70, 73%) reported plans to continue living in Ireland indefinitely, indicating a strong intention to settle in the country. Smaller proportions planned to stay for up to 2 years (N = 14, 15%), up to 5 years (N = 9, 9%), or less than 1 year (N = 3, 3%). This distribution suggests that the majority of Brazilian migrants in the sample view Ireland as a long-term destination (See Table 2).

Table 2: Descriptive Statistics for Plans of Continue Living in Ireland, n = 96

Variables	N	%
How long would you plan to continue living in Ireland?		
Less than 1 year ahead	3	3 %
Up to 2 years	14	15 %
Up to 5 years	9	9 %
Indefinite time	70	73 %

Figure 4: Distribution of Participants per Gender and Intention to Continue Living in Ireland

Descriptive statistics in relation to the psychometric scales

The descriptive statistics for the psychometric scales revealed moderate to high levels of satisfaction with life (M = 4.31, SD = 1.44), moderate levels of acculturative stress (M = 2.44, SD = 0.762), and moderate to high levels of coping self-efficacy (M = 6.72, SD = 1.99). Loneliness levels were moderate (M = 2.32, SD = 0.743), while perceived social support was high (M = 5.33, SD = 1.28). These findings suggest that while Brazilian migrants in Ireland generally experience moderate levels of acculturative stress, they also report moderate to high levels of life satisfaction, coping self-efficacy, and social support (Tables 3 and 4).

Table 3: Criteria for Mean Values of each scale

Scale	Low	Moderate	High
Satisfaction with Life	1 – 2.9	3 – 5	5.1 – 7
Acculturative Stress	1 – 1.9	2 – 3.5	3.6 – 5
Coping Self-efficacy	1 – 3.4	3.5 – 7	7.1 – 10
Loneliness	1 – 2	2.1 – 3	3.1 – 4
Perceived Social Support	1 – 2.9	3 – 5	5.1 – 7

Table 4: Descriptive Statistics per instrument scale used, n = 96

Scales and Subscales	Mean	SD.	N of Items	Cronbach's Alpha
1. Satisfaction with Life Scale	4.31	1.44	**5**	.91
2. Acculturative Stress Scale for International Students	2.44	0.76	**36**	.96
Homesickness	2.87	1.01	4	.77
Culture Shock	2.42	0.82	3	.51

Scales and Subscales	Mean	SD.	N of Items	Cronbach's Alpha
Perceived Discrimination	2.51	0.91	8	.90
Perceived Hate	2.01	0.81	5	.85
General Acculturative Stress	2.62	0.86	10	.85
Fear	2.08	0.94	4	.83
Guilt	2.21	1.14	2	.71
3. Coping Self-Efficacy Scale	6.72	1.99	**26**	.98
Use problem-focused coping	7.06	2	12	.96
Stop unpleasant emotions and thoughts	6.41	2.12	9	.94
Get support from friends and family	6.43	2.3	5	.89
4. USL-10 – Loneliness Scale	2.32	0.74	**10**	.91
5. Multidimensional Scale of Perceived Social Support	5.33	1.28	**12**	.93
Significant Others	5.78	1.45	4	.92
Family	4.98	1.74	4	.94
Friends	5.23	1.51	4	.92

Inferential Statistics

The inferential statistics aimed to test the hypotheses formulated in the study. In relation to hypotheses one and two, positing that those who have lived in Ireland for a longer duration will experience lower levels of acculturative stress and higher levels of life satisfaction, two one way between groups analysis of variance (ANOVA) were conducted to examine these cross-sectional elements. In relation to acculturative stress significant differences were found based on the duration of stay in Ireland ($F(2, 95) = 5.04$, $p = .008$). Post hoc analyses further clarified these differences showing results that Brazilian migrants who had lived in Ireland for less than two years reported significantly higher levels of acculturative stress compared to those who had lived there for more than five years (mean difference = .62, $p = .006$). Similarly, life satisfaction also reports differences based on the number of years living in Ireland ($F(2, 95) = 8.13$, $p = .001$). Those who had lived in Ireland for more than five years reported significantly higher levels of life satisfaction compared to those who had lived there for less than two years (mean difference = 1.14, $p = .005$) or between three and five years (mean difference = 1.11, $p = .002$).

In relation to hypotheses three and four, positing that migrating alone or accompanied affect the levels of loneliness and coping self-efficacy in Brazilian migrants, independent sample t-tests were conducted (See Table 5) to examine these cross-sectional elements. In relation to those who migrated alone or accompanied, the results revealed no significant differences in loneliness between the two groups ($t(94) = -.03$, p = .980), as presented on Table 6. Likewise, coping self-efficacy presented no significant differences between the two groups ($t(94) = -.51$, p = .612). This suggests that migrating alone or accompanied may not be the primary determinant of loneliness or coping self-efficacy among Brazilian migrants in Ireland.

Table 5: Comparison between Alone Migrated and Accompanied Migrated Brazilians' with Loneliness and Coping Self-Efficacy

	Migration	N	Mean	Std. Deviation	t	df	Sig.
Loneliness	Alone	52	2.32	.78	-.03	94	.98
	Accompanied	44	2.32	.70			
Coping Self-Efficacy	Alone	52	6.62	2.02	-.51	94	.61
	Accompanied	44	6.82	1.97			

*Significance level at p < .05

In relation to hypothesis five, proposing that coping self-efficacy, social support and time in Ireland would positively correlate with life satisfaction, Pearson's correlation coefficients were conducted (See Table 6). The results confirmed this revealing significant positive correlations between coping self-efficacy and perceived social support ($r = .44$, $p < .01$), coping self-efficacy and life satisfaction ($r = .61$, $p < .01$), perceived social support and life satisfaction ($r = .37$, $p < .01$), and time in Ireland and life satisfaction ($r = .34$, $p < .01$). These findings highlight the importance of coping skills, social support, and duration of stay in promoting life satisfaction among Brazilian migrants.

Table 6: Correlation among Coping self-efficacy, Social Support, Time in Ireland, and Satisfaction with Life

Pearson's Correlation	1	2	3	4
Coping Self-efficacy (1)	-			
Perceived Social Support (2)	**.44****	-		
Time in Ireland (3)	.19	.08	-	
Satisfaction with Life (4)	**.61****	**.37****	**.34****	-

*p < .05, **p < .01

In relation to hypothesis six, which proposed that loneliness would significantly negatively predict coping self-efficacy, a linear regression analysis was conducted to examine this predictive relationship, and was also supported. Results confirmed that loneliness was a significant predictor of coping self-efficacy ($F(1, 95) = 22.87$, $p < .001$), accounting for approximately 18.7% of the variance. This finding suggests that loneliness can hinder the development and utilization of coping skills ($\beta = -.44$, $p < .001$, CI [95%] = -1.68, -.69), potentially leading to difficulties in adjusting to a new cultural environment.

Finally, in relation to hypothesis seven, which posited that social support, coping self-efficacy, acculturative stress, and loneliness would directly affect the life satisfaction of Brazilians, was likewise supported. A multiple regression analysis revealed life satisfaction was significantly predicted by the combination of the four predictor variables which accounted for 42.3% of the variance in life satisfaction ($F(4, 91) = 19.39$, $p < .001$, $R^2 = .42$). When considering the predictors in the model, coping self-efficacy and acculturative stress were the significant predictors, with coping self-efficacy positively predicting life satisfaction (β = .43, p <.001, CI [95%] = .18, .45) whereas acculturative stress negatively predicted life satisfaction (β = .-.21, p =.029, CI [95%] = -.75, -.04). Loneliness (β = -.14, p =.172, CI [95%] = -.68, .12) shows a negative association with life satisfaction, suggesting a potential direct effect, however, this effect was not statistically significant in the model, so the hypothesis is not fully supported in this regard. Perceived social support (β = .04, p =.648, CI [95%] = -.17, .27) likewise did not demonstrate a significant direct effect on life satisfaction. These findings underscore the complex interplay of factors that contribute to life satisfaction among Brazilian migrants in Ireland, emphasizing the importance of coping skills, acculturative stress, in shaping their life satisfaction.

Table 7: Effects of Social Support, Coping Self-Efficacy, Acculturative Stress, and Loneliness on Life Satisfaction

			95.0% Confidence Interval for B	
	Beta	Sig.	Lower Bound	Upper Bound
Acculturative Stress Scale for International Students	-.21	.029	-.75	-.04
Coping Self-Efficacy Scale	.43	<.001	.18	.45
Loneliness Scale	-.14	.172	-.68	.12
Multidimensional Scale of Perceived Social Support	.04	.648	-.17	.27

Discussion

The present study sought to investigate the predictive and influential roles of coping self-efficacy skills, social support, and loneliness on acculturative stress and life satisfaction among Brazilians residing in Ireland. The research hypotheses were formulated based on a comprehensive review of relevant literature.

The hypotheses one and two, postulating that the duration of residence in Ireland would correlate with acculturative stress (H1) and life satisfaction (H2), were strongly supported by this study's findings. Brazilian migrants residing in Ireland for less than two years reported significantly higher acculturative stress and lower life satisfaction compared to those who had lived in the country for over five years. This indicates that the initial period of cultural adaptation is particularly challenging, but with increased time in Ireland, acculturative stress decreases and life satisfaction improves. These results align with previous research (Wilton and Constantine, 2003; Campbell, 2004; Amer, 2005; Sawir et al., 2008), indicating that living a longer time in a new country facilitate greater adjustment, integration, and self-confidence, ultimately contributing to lower acculturative stress and higher life satisfaction. This positive association is likely due to increased cultural familiarity, stronger social networks, and improved language skills over time (Campbell, 2004; Sawir et al., 2008; Bhochhibhoya, Dong and Branscum, 2018). Furthermore, the fact that 73% of participants expressed their intention to remain in Ireland indefinitely reinforces the notion that longer durations of stay contribute to overall well-being. The findings emphasize the importance of time and continued residence in fostering successful adaptation and well-being among Brazilian migrants in Ireland.

In hypotheses three and four, which posited that migrating alone would be associated with increased loneliness (H3) and decreased coping self-efficacy (H4), were not supported as no significant differences were found in loneliness or coping self-efficacy between individuals who migrated alone and those who migrated with a companion. This finding challenges the common assumption that migrating alone automatically leads to greater loneliness and reduced coping skills. Instead, it suggests that individual differences, resilience, and the ability to form social connections in the new environment may be more influential in determining loneliness and coping self-efficacy than simply migrating alone. Existing research (Wiseman, 1997; Stack, 1998; Wright, 2005; İskender, 2018) has suggested a link between migrating alone and increased loneliness, but this study's findings do not support that correlation. Moreover, studies by De Jong Gierveld and Van Tilburg (2006), Liu and Rook (2013), and Kate, Bilecen and Steverink (2020) have demonstrated that loneliness is not solely determined by the quantity of social connections, but rather by the quality and meaningfulness of those relationships. The results align with previous research cited, suggesting that factors such as individual personality traits, the availability of social support networks, and effective coping mechanisms may be more critical in mitigating loneliness and fostering self-efficacy among migrants, regardless of whether they migrate alone or with others.

In hypothesis five, postulating that coping self-efficacy, social support, and time in Ireland would correlate positively with life satisfaction, was strongly supported. Results showed significant positive correlations between coping self-efficacy, perceived social support, time spent in Ireland, and overall life satisfaction among Brazilian migrants. This suggests that individuals who believe in their ability to cope with challenges, feel supported by others, and have lived in Ireland for a longer duration tend to report higher life satisfaction. This finding aligns with previous research by Campbell (2004) and Sawir et al. (2008) and highlights the importance of these factors in successful adaptation and well-being of migrants.

In hypothesis six, positing that loneliness would negatively affect individuals' coping self-efficacy, was also supported. Loneliness was found to be a significant predictor of coping self-efficacy, explaining 19.6% of the variance. This indicates that feeling lonely can significantly undermine an individual's perception of their ability to cope with challenges and stressors, leading to decreased coping self-efficacy. This aligns with findings from Sawir et al. (2008) and underscores the importance of addressing loneliness in the migrant population. The results of hypotheses five and six highlight the interconnectedness of social support, coping self-efficacy, and loneliness in the wellbeing of Brazilian migrants in Ireland. It suggests that fostering social connections, enhancing coping skills, and mitigating loneliness are crucial for promoting life satisfaction and successful adaptation to a new cultural environment.

In hypothesis seven, which posited that life satisfaction would be positively predicted by social support and coping self-efficacy, while negatively predicted by acculturative stress and loneliness, was partially supported by this study's findings. Coping self-efficacy significantly and positively predicted life satisfaction, while acculturative stress had a significant negative impact. However, social support and loneliness did not emerge as significant predictors in this study. These findings highlight the complex interplay of factors influencing life satisfaction among Brazilian migrants in Ireland, emphasising the critical role of coping mechanisms in navigating the challenges of migration and promoting well-being. The prominence of coping self-efficacy aligns with existing research on migrant and general populations, (Yeh and Inose, 2003; Constantine, Okazaki and Utsey, 2004; Brown and Holloway, 2008), underscoring the importance of fostering effective coping skills to reduce the negative effects of acculturative stress and loneliness. They emphasise the need for interventions that address not only the practical challenges of migration but also the psychological and social dimensions to enhance the overall well-being of individuals adapting to a new cultural context.

Overall, this comprehensive analysis provides valuable insights into the adaptation process of Brazilian migrants in Ireland. It highlights the importance of time of adjustment, coping skills, social support, and addressing loneliness and acculturative stress in promoting well-being and successful integration into a new cultural environment. These findings can inform the development of targeted psychosocial interventions and support services for migrants, ultimately improving their quality of life in their adopted home.

Limitations and Future Directions

While this study provides valuable insights into the factors that influence acculturative stress and life satisfaction among Brazilian migrants in Ireland, it is not without limitations. One notable limitation is the sample's representativeness of the broader migrant population. Due to the constraints of this undergraduate research project, the target group had to be narrowed down to Brazilian migrants who were easily accessible through the researcher's network. The exclusion of other nationalities and migrant groups limits the generalizability of the findings to the broader migrant population in Ireland. Future research should aim to include a more diverse sample of migrants across different locations in the country to explore potential variations in acculturative stress and life satisfaction across different nationalities and backgrounds.

Another limitation pertains to the sample size, which, while adequate for this study, may not fully capture the experiences of the entire population of Brazilians in Ireland. The estimated number of Brazilians residing in Ireland is considerably larger (CSO, 2022) than the sample size that an undergraduate psychology researcher can realistically recruit. Future research with larger sample sizes would enhance the statistical power of the analyses and provide a more comprehensive understanding of the factors that influence the well-being of Brazilian migrants.

While non-probability sampling is a common approach in research with hard-to-reach populations, it is important to acknowledge its limitations. Besides the sample not being fully representative of the entire population of Brazilian migrants in Ireland, participants who are more active on social media or have larger social networks may be overrepresented, while those who are less connected or have privacy concerns may be underrepresented. Furthermore, since participants were recruited through the researcher's network, the study likely over-represents Brazilians living in Dublin. This might bias the findings and limit the results because experiences can differ across Ireland due to factors like community support, job opportunities, and social integration, all of which affect stress and life satisfaction. Future studies should include Brazilians from various locations in Ireland.

The overrepresentation of long-term migrants in the sample is another limitation that warrants consideration. The majority of participants had lived in Ireland for more than three or five years, which may not accurately reflect the experiences of those who have recently arrived in the country. As the study's findings indicate, longer durations of stay are associated with higher levels of life satisfaction, social support, and coping self-efficacy, as well as lower levels of acculturative stress. Therefore, the experiences of recent migrants, who may be facing more acute challenges related to acculturation, loneliness and adjustment, may not be fully captured in this study. Future research should strive to include a more balanced representation of short and long-term migrants to gain a more nuanced understanding of the temporal dynamics of acculturative stress and life satisfaction.

The unexpected finding that migrating alone did not significantly affect loneliness or coping self-efficacy should be taken in consideration for further investigation. By isolating confounding variables, such as the presence of partners or the availability of social support networks for economic migrants, to better understand the relationship between migration patterns, loneliness, and coping self-efficacy; and to gain a more nuanced understanding of the complex interplay between migration patterns, social support, and individual resilience in determining mental health outcomes for economic migrants.

Access to the target population also presented challenges in this study. The lack of prior research on migrant mental health in Ireland made necessary the use of multiple measures to investigate the various factors that could potentially impact migrant’s well-being. This resulted in a lengthy survey, which may have deterred some potential participants and affected the quality of responses. Additionally, the language barrier poses a significant obstacle in reaching the target population and recruiting participants. While the survey was conducted in English, the researcher acknowledges that some participants may have understated their experiences and perceptions due to language limitations. Future research could address this limitation by offering the survey in the participants' native language, ensuring greater accessibility and accuracy of responses.

Furthermore, the study did not collect data on participants' educational attainment, which has been identified as a potential predictor of mental health in previous research (Dey and Lucas, 2006; Marcelli et al., 2009). Incorporating educational attainment as a variable in future studies could provide additional insights into the factors that influence the well-being of Brazilian migrants in Ireland.

Implications for Policy and Practice

Despite these limitations, the study's findings have important implications for policy and practice in the context of migrants' mental health in Ireland. The significant association between the duration of residence and acculturative stress highlights the need for targeted interventions and support services for recent migrants. These interventions could focus on providing information and resources on cultural adjustment, language acquisition, and social integration to facilitate a smoother transition into Irish society. Additionally, the positive correlation between social support and life satisfaction underscores the importance of fostering social connections and community engagement among Brazilian migrants, and potentially other ethnic groups. Policymakers and service providers could develop initiatives that promote intercultural dialogue, facilitate access to social networks, and create opportunities for meaningful interactions between migrants and the host community.

The study's findings also have implications for professional networks and mental health practitioners working with Brazilian migrants in Ireland. The significant impact of loneliness on coping self-efficacy suggests that addressing loneliness should be a priority in mental health interventions. Employers and education providers could facilitate access to information and psychoeducational activities about mental health for migrants to help increase awareness and accessibility to relevant support services, as well as demystifying stigma around mental health. Practitioners could offer individual and group counselling, support groups, and social skills training to help migrants overcome feelings of isolation and develop effective coping strategies. Furthermore, the multifaceted nature of life satisfaction among Brazilian migrants, as evidenced by the significant predictors of social support, coping self-efficacy, acculturative stress, and loneliness, calls for a holistic approach to mental health care. Practitioners should consider these various factors when assessing and treating mental health issues among Brazilian migrants, tailoring interventions to address their unique needs and challenges.

In conclusion, this study contributes to the growing body of knowledge on migrant mental health in Ireland by examining the predictive and influential roles of coping self-efficacy skills, social support, and loneliness on acculturative stress and life satisfaction among Brazilian migrants. The findings highlight the importance of the duration of residence, social support, coping skills, and loneliness in shaping the well-being of Brazilian migrants in Ireland. While the study has limitations, its findings have important implications for policy and practice in the context of migrants' mental health in Ireland. By addressing the unique challenges faced by Brazilian migrants and providing tailored support services, policymakers and practitioners can contribute to improving the mental health and overall well-being of this growing population in Ireland.

In terms of future research directions, it would be valuable to explore the specific coping strategies employed by Brazilian migrants in Ireland and their effectiveness in mitigating acculturative stress in comparison to other ethnic groups of migrants. Additionally, investigating the role of cultural factors, such as values, beliefs, and traditions, in shaping the acculturation process and mental health outcomes could provide further insights. Moreover, extending studies on these factors among Brazilian migrants living in other countries could also provide valuable comparisons of how the same ethnic group would present their coping strategies in different cultural settings, as well as, the interplay of social support and loneliness in acculturative stress and life satisfaction. Longitudinal studies could also be conducted to examine the long-term effects of acculturation on the mental health and well-being of migrants.

Furthermore, future research could delve deeper into the relationship between social support and coping self-efficacy. While this study found a significant correlation between these two variables, the directionality of the relationship remains unclear. It is possible that social support enhances coping self-efficacy, or that individuals with higher coping self-efficacy are more likely to seek and utilize social support. Understanding the causal relationship between these variables could inform the development of more effective interventions to promote mental health among migrants.

Finally, future research could explore the potential impact of discrimination and prejudice on the mental health of migrants in Ireland. While this study did not specifically examine these factors, previous research has shown that experiences of discrimination can have detrimental effects on mental health (Paradies et al., 2015). Investigating the prevalence and impact of discrimination on migrants in Ireland could inform the development of anti-discrimination policies and interventions to create a more inclusive and supportive environment for migrants in Ireland.

Conclusion

Despite its limitations, this study offers valuable insights into the factors influencing the lived experiences of Brazilian migrants, particularly those residing in Ireland, a country with a steadily increasing migrant population. By focusing on a non-European ethnic group, this research contributes to a more diverse understanding of migrant experiences, addressing a gap highlighted by Arnett (2008), Matsumoto and Juang (2012) and Henrich, Heine and Norenzayan (2020).

The findings of this study shed light to potential avenues for future research and interventions aimed at improving the conditions and support available to migrants in Ireland. By understanding the diverse stressors migrants face and the coping mechanisms they employ, researchers, practitioners, and policymakers can develop targeted strategies to enhance their quality of life and facilitate their integration into Irish society.

Implications for Research

This study's findings underscore the need for further research into the mental health of migrants in Ireland. Future studies could explore the experiences of other migrant groups, examining the unique challenges and resiliencies they exhibit.

Longitudinal research could track the mental health trajectories of migrants over time, shedding light on the long-term effects of acculturation and the factors that contribute to positive adaptation.

Additionally, research could delve deeper into the specific coping strategies that are most effective for migrants in different contexts. By identifying evidence-based interventions, practitioners can develop culturally sensitive programs to enhance migrants' coping self-efficacy and resilience.

Implications for Practice

The results of this study have several implications for practitioners working with migrant populations. First, it highlights the importance of providing culturally competent mental health services that are accessible and responsive to the unique needs of migrants. This may involve offering services in migrants' native languages, employing culturally sensitive therapists, and addressing the stigma associated with seeking mental health help.

Second, the findings suggest that interventions aimed at enhancing social support and integration could be beneficial for migrants' mental health. This could involve creating community programs that facilitate social connections, providing language and cultural training, and promoting inclusive workplaces and educational institutions.

Third, practitioners could develop interventions that specifically target the factors identified in this study as predictors of life satisfaction, such as coping self-efficacy, perceived social support, and acculturative stress. These interventions could include individual counselling, group therapy, and community-based programs that focus on building coping skills, enhancing social networks, and reducing acculturative stress.

Implications for Policy

Policymakers can play a crucial role in supporting the mental health of migrants. The findings of this study suggest that policies that promote social inclusion, provide access to affordable healthcare, and address discrimination could significantly improve the well-being of migrants.

Furthermore, policymakers could consider implementing programs that facilitate the integration of migrants into the workforce and educational system. This could involve providing language training, recognizing foreign qualifications, and creating pathways to citizenship.

Call to Action

The mental health of migrants is a complex issue that requires a multi-faceted approach. Researchers, practitioners, education and employment providers, and policymakers must work together to develop and implement evidence-based interventions that address the unique challenges faced by migrants. By investing in the mental health of migrants, a country does not only improve their quality of life but also enrich the social fabric of communities and strengthen economies.

In conclusion, this study serves as a call to action for all stakeholders involved in the well-being of migrants. By prioritizing research, practice, and policy initiatives that support the mental health of migrants, it can create a more inclusive and equitable society for all.

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Rewilding Plans for a Small Farm in Sligo

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Abstract

This article outlines the path to rewilding a farm in Co. Sligo driven by the intersection of art, science, and sustainable agriculture. Inspired by rewilding projects and the ecological research of artists and scientists, we seek to transform a former suckler farm into a thriving, biodiverse ecosystem. With no prior farming experience, we are drawing on expert guidance and government supported initiatives such as the National Parks and Wildlife Service Farm Plan Scheme. Our efforts aim to create species-rich meadows, wooded areas and orchards to enhance biodiversity, and develop a model for sustainable land management. This project blends artistic expression with agricultural science to promote ecological restoration and create a place where wildlife can flourish.

Figure 1: View of Knocknarae from the farm in South Co. Sligo (photo by the author)

Keywords: Biodiversity, Ecology, Conservation, Environmental Protection, Sustainability, Wildlife Reintroduction.

Introduction

"..how can we achieve a paradigm shift away from the past and present situation, in which only either nature or people do well, towards a future in which both are able to survive, and indeed, thrive, together?"

- Eoghan Daltun (2022)

As an artist focused on ecological issues, my work explores the narratives and aesthetics of nature to highlight our connection with the environment. My interest in nature, especially pollinators, along with my research into eco-social artistic practices, has drawn me toward rewilding. Projects by Clodagh Emoe (2018), Lisa Fingleton (2023), and the research of Dr Cathy Fitzgerald (2021) have had a significant impact on my thinking. While my partner Diarmaid, an engineer with master's degrees in biochemical engineering, natural resource economics, and in environmental engineering, brings a wealth of technical knowledge and a pragmatic approach to ecological restoration and project management. In an era where the intersection of art and science is increasingly recognised as a vital avenue for addressing ecological challenges, we found ourselves with a shared vision - the rewilding of agricultural landscapes. Rewilding, a relatively new concept in ecological restoration, offers fresh potential for restoring ecosystems and biodiversity on abandoned or degraded land. We aim to explore how rewilding can change traditional farming into a vibrant ecosystem that supports biodiversity, improves soil health, and builds resilience to climate change. This article aims to summarise our discussions and vision, combining artistic expression with technical research to imagine a better relationship between agriculture and nature. Artistic ecoliteracy and place based/ site specific creative practices have informed our thinking (Fitzgerald, 2008) Through our collaborative efforts, we hope to explore the potential of rewilding as a pathway to ecological restoration. Neither of us have any experience in farming or rewilding, so we plan to connect with experts and support networks where we can find them. Like many others, we are balancing jobs in other areas alongside our farming efforts. We hope this article provides useful information for those considering a similar rewilding endeavor.

Climate change and climate anxiety have been a driving force for both of us, particularly in our late teens and early twenties when the concepts were introduced to us by progressive teachers and lecturers, and by environmental writers and documentarians. We both spent our childhood summers in the countryside (Donegal and Clare), and we were both acutely aware of how increasingly intensive farming had changed the landscape we were intimately familiar with. In our shared memories of trips outside Dublin, we noticed that windscreens would be covered with insects by the end of our journey. Our cars may have become more aerodynamic, somewhat reducing the number of impacts, but there is no doubt that the number and density of insects throughout the country has reduced dramatically since our youth. Biodiversity loss was happening in real time right in front of our very eyes. Due to these personal observations and anxieties we resolved to try and do something, anything, to help create mini nature reserves where we could. Ten years ago, we rewilded our urban garden. We dug a pond, we planted pollinator-friendly plants extending the flowering season, and we let a number of areas go wild with only 1 – 2 cuts per year.

Figures 2a and 2b: The Rewilded Garden in Rathfarnham (photos by the author)

These efforts have paid off and we have seen noticeable increases in wildlife in our garden. We have observed numerous insects, bees, hoverflies, butterflies and moths, damselfly and dragonfly species and vertebrates such as frogs. Rare species such as the comma, holly blue butterflies and hummingbird hawk moth were also noticed.

And that inspired us to push on. For the past few years, we have been searching for a larger area to rewild. We researched various rewilding projects, including those by Eoghan Daltun (2022) in the Beara Peninsula, and Isabella Tree (2019) in Knepp, Dorset. We also looked into the work carried out by a number of organisations including the National Parks and Wildlife Service and Farming for Nature (O’Rourke et al., 2020). In spring of this year, 2024, we purchased a 33-acre farm in South Sligo.

Figure 3: The Farm in Sligo (photo by the author)

The Farm

The land was effectively abandoned and had been untended for over two years. It had previously operated as a suckler farm. It includes a three-bay slatted cow shed, a hay barn, and an old semi-derelict calving house. Additionally, there is a traditional cottage originally built in the late 1800s. It has stunning panoramic views over the rolling countryside with views to the Ox Mountains, Carrowkeel and Knocknarea cairns in Sligo, and Kilronan and Corry Mountains in Leitrim.

The land on the farm can be considered to have two main sections: a lower level of wet grassland, and a more elevated meadow, both of which appear species rich.

The Department of Agriculture, Food and the Marine’s Afforestation Scheme

The Afforestation Scheme is a government initiative aimed at increasing forest cover by encouraging landowners to plant trees on their land, Department of Agriculture, Food and the Marine (2023 - 2027). This scheme provides financial incentives, including grants for establishing new forests and annual premium payments to support the maintenance of these plantations over time. The scheme is designed to enhance environmental sustainability, support biodiversity, and contribute to the rural economy by promoting sustainable forestry practices. By offering long-term financial support, the afforestation scheme plays a crucial role in Ireland's efforts to meet its climate action targets. There are a number of different forest types each with different levels of grant payments and annual premiums. For example, Forest Type 6 – Pure Broadleaves offers an establishment grant payment of €6,744 / ha and an annual premium of €1,037 / ha. A broadleaf forest closely tied in with what we were trying to do. Knowing that Ireland has the lowest area of native woodland cover in Europe at 1.25% (Cross, 2012, p.7), we wanted to play a small part in rectifying this and provide an ecologically rich area for wildlife to thrive.

In conjunction with a forestry co-op, we made an application to this scheme. The formal afforestation application (similar to planning permission), land preparation, sapling sourcing and planting, deer exclusion fencing, and maintenance would all be carried out by the forestry co-op. The establishment grant would cover these costs, while the annual premium would come to us. However, our application was rejected due to the land’s proximity to a marked, albeit abandoned, curlew nest site. Curlews are a ground nesting bird. We were to learn that 3,300-5,500 pairs are estimated to have bred in the Republic of Ireland in the late 1980’s, but by 2017 it is estimated that no more than 150 pairs remain (O’Donoghue et al., 2019, as cited in Harrison et al., 2023), representing a decline of 96% in the breeding population.This factor was significant as our primary goal was to improve the ecological outlook for local wildlife.

Figure 4: Curlew (photo by Kathryn Finney) Birdwatch Ireland

The National Parks and Wildlife Service Plan Scheme

We subsequently made contact with the National Parks and Wildlife Service who manage the curlew nesting sites. After a site visit, they enrolled us in their Farm Plan scheme, the National Parks & Wildlife Service (NPWS) Farm Plan Scheme (Department of Culture, Heritage and the Gaeltacht, 2020). This scheme also offers establishment grants and annual premiums. It should be noted however that the annual premiums on offer are significantly less than the afforestation scheme and require significantly more work, both in terms of land management and in terms of the application process. The maximum available premium with the Farm Plan Scheme is €450/ha, and this is reduced by a certain penalty percentage (from 0 – 100%) depending on the quality of the ecosystem created. While the premium associated with the forestry scheme is €1,037/ha with no penalties applied. The guidance and support documentation are not nearly as developed as the Afforestation Scheme.

The NPWS have assigned an Agri-Environmental Consultant to assist us, and their support has been invaluable.

Initial Meeting with the Agri-Environmental Consultant

An assessment was conducted by the Agri-Environmental Consultant on the current ecological condition of the farm. This evaluation considered several factors, including flora species diversity, the presence of invasive species, soil type, and soil fertility levels. Together we developed a farm plan suitable to the location.

The land on the farm can be considered to have two main sections: a lower level of wet grassland, and a more elevated meadow. The wet grasslands are species-rich, with a variety of plants including common spotted orchids and marsh marigolds, but they exhibit poor structural quality and there are large areas of thatch, i.e., matted dead grass. In contrast, the elevated meadows show high nutrient levels and are also affected by heavy rush and creeping buttercup colonisation. There are some established hedgerows containing a variety of species such as willow, crabapple, hawthorn, sycamore and ash. Our goal is to restore the land and hedgerows to its pre-intense-cultivation state.

We presented a concept plan to bring the farm back into "light" productive use, focusing on sustainable and ecologically supportive agricultural practices that respect the farm's environmental context. In consultation with and on the recommendation of the agri-environmental consultant, we proposed that half of the farm be restored, supported and managed as species-rich grassland for breeding waders, while the other half will be species-rich meadow, and hedgerows will be restored in this portion.

We have also proposed to include a small fruit orchard, woodland grove, and kitchen and ornamental gardens.

Without support for this plan, the farm will most likely be rented out for standard intensive farming practices with little consideration for its potential ecological and biodiversity benefits. For the purpose of this article, we will focus on the plan to restore the species-rich grassland and meadow as these may be more interesting to others interested in doing the same.

Species- Rich Grassland for Breeding Waders

Species-rich grasslands play a critical role in supporting breeding waders, which are a group of ground-nesting birds including species such as the curlew, lapwing, and snipe. These grasslands are characterised by a high diversity of plant species, which in turn supports a rich invertebrate fauna, providing essential food resources for wader chicks and adults. The diversity of species-rich grasslands, with a mix of sward heights and plant types, creates suitable nesting and foraging habitats for these birds.

The ideal conditions for breeding waders in species-rich grasslands include a mosaic of short and tall vegetation. Short swarths provide feeding areas where waders can access soil-dwelling invertebrates, while taller vegetation offers cover and nesting sites. Maintaining these conditions requires specific management practices such as grazing, mowing and removal of cut material, which will prevent the dominance of overly competitive plant species while promoting biodiversity.

We will restore the area by cutting and removing the existing two-years' growth of grass swarth. We found one contractor who is willing to cut, rake and bale without twine or plastic, and relocate these loose bales towards the boundaries of the fields they were cut from. This was considered the best restoration option. In time these loose bales will rot down and the resulting compost will be used in the kitchen and ornamental gardens, and in the orchards.

Grass will be mowed from the centre of each field, working outwards. This will allow wildlife to safely make their way to another area. All hedge rows will be trimmed and reduced in height to ≤ 1.8 metres. A number of trees within this zone and within the hedgerows of this zone will be required to be cut down as they can act as perches for the predators of wading birds, their eggs and chicks.

A "scrape", i.e., a shallow pond, will be cut into the largest field. This will be 25 metres long x 8 metres (max) wide x 0.8 metres deep (max). This will provide several benefits that support breeding waders. These shallow depressions in the ground, typically filled with water seasonally, create a variety of microhabitats that are crucial for the survival and reproduction of wading birds.

Figure 5: Ragged Robin in one of the lower fields (photo by the author)

Species Rich Meadow

Species-rich meadows are highly diverse grassland ecosystems characterised by a wide variety of plant species. These meadows are crucial for biodiversity, supporting a wide range of native flora and fauna. The high plant diversity ensures a stable and resilient ecosystem capable of withstanding environmental changes and stresses. These meadows support a wide array of pollinators, including bees, butterflies, and hoverflies, which are vital for the pollination of many crops and wild plants. Additionally, the varied plant structure and composition provide habitats for a multitude of invertebrates, birds, and small mammals, contributing to complex food webs and ecological interactions.

The conservation of species-rich meadows requires careful management practices that mimic traditional agricultural methods. Periodic cutting or grazing prevents the encroachment of woody plants and maintains the open structure of the meadow. We intend to acquire a small herd of five dexter or highland cattle to facilitate grazing on the land. Originating from indigenous Irish and Scottish cattle breeds, these animals are characterized by their small stature and hardy constitution, rendering them the most ecologically sensitive grazers. Restoration of degraded meadows involves managing the land to promote natural regeneration processes. Monitoring and adaptive management are essential to ensure the long-term health and biodiversity of species-rich meadows. Avoiding the use of chemical fertilizers and pesticides preserves the natural plant and insect communities.

The Next Steps

We are currently awaiting funding approval while the ecologist works on the plan for our farm. Each NPWS Farm Plan is unique and requires detailed, site-specific actions. The ecologist seems to be overwhelmed with the number of plans he is responsible for. Inevitably, this has led to delays which have been exacerbated by bureaucracy. The application for the NPWS Farm Plan scheme requires extensive documentation and it appears that the scheme is significantly under-resourced.

As autumn approaches, we are eager to undertake an initial cut of the grass to mitigate thatch accumulation. According to the ecologist there is a large and viable seed bank within the soil already waiting to emerge, so no additional wildflower seeding is required. All that is needed is light and space for the existing seeds to grow. We are excited to witness the emergence of additional wildflower species, particularly following our recent discovery of Devil's Bit Scabious at the margins of one of the back fields. This native wildflower is the singular food source of the caterpillars of the rare and protected Marsh Fritillary butterfly(Butterfly Conservation UK, 2020).

Coming from urban backgrounds, our agriculture and rewilding journey is proving to be a significant challenge but also a fascinating and rewarding learning experience. We have been enrolled in An Teagasc's Green Cert Agriculture and Farming course, and we hope that this will further enhance our understanding and capabilities in this sector.

Conclusion

Our rewilding project and sustainable land management reflects a broader, emerging shift in how people are rethinking the relationship between agriculture and nature. Despite the challenges we face (i.e., limited experience, bureaucratic hurdles, and the complexities of navigating government schemes), we remain committed to this process. By collaborating with environmental consultants and participating in programmes like the NPWS Farm Plan, we are working to turn this vision into reality. We hope this project will contribute to the growing body of rewilding efforts, inspiring others to explore how small-scale interventions can help rebuild ecosystems and create a more sustainable future.

Further Reading

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Can Marketing Save The Planet? 101 Practical Ways to use Sustainable Marketing as a Force for Good

Michelle Carvill and Gemma Butler

(Bloomsbury, 2024)

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Can Marketing Save The Planet? by Michelle Carvill and Gemma Butler underscores an essential message: marketing must acknowledge and address its environmental impact. This book serves as a comprehensive resource for marketing and communication professionals seeking to transform their practices. It is relevant not only for marketers but also for public relations practitioners. In today's swiftly changing, consumer-focused landscape—where more than 10 million people work in marketing—social and environmental concerns are gaining significant attention among executive priorities.

Carvill and Butler, distinguished leaders in sustainability marketing, tackle the tension between consumer-driven markets and the pressing need to address the climate crisis. They assert that integrating sustainability into marketing strategies not only fulfils ethical and responsible practices but also enhances customer loyalty and bolsters brand reputation. By minimising waste and conserving resources, businesses can achieve greater efficiency and productivity, which in turn can drive higher profits. Their prior work, *Sustainable marketing – how to drive profits with purpose*, received high praise, further establishing their authority in the field.

A distinctive aspect of this book is its ability to elucidate complex sustainability concepts, rendering them accessible to professionals. The book is systematically organised, featuring a 101-topic directory that offers practical, actionable guidance across five principal sections: situational analysis, objectives and goals, strategy, tactics, and measurement and KPIs—designated as fundamental components of sustainability within the text. This methodical approach provides a broad overview, establishing the book as a versatile resource for those seeking precise and targeted advice. Each of the 101 topics is designed to function independently, detailing what it entails, its significance, and how to initiate implementation. Furthermore, each chapter prompts readers to consider three specific actions based on the knowledge acquired, thereby facilitating practical application of the concepts presented.

This book is an invaluable resource, replete with authoritative content and actionable guidance. The authors adeptly direct readers to reputable sources such as the UN Sustainable Development Goals and the IPCC, ensuring that their recommendations are firmly based on credible information. This meticulous curation is particularly crucial in an era where misinformation is widespread.

The book is extensively comprehensive, with a central focus on enabling marketers to advance sustainability and effect change both internally and externally. It incorporates the latest insights, case studies, and trends, covering a wide range of topics from circular economy to carbon footprint, greenwashing to degrowth, all presented in a clear and accessible manner.

In conclusion, the book delivers a singular and compelling message: marketers must be both well-informed and proactive in leading the transformation of consumer behaviour and fostering innovation with a sustainability focus. This strategic approach is pivotal for achieving future success and for promoting a healthier, safer, and more productive environment.

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