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Assessing the Influence of Design Thinking in South African Higher Education: A Comprehensive Review of Diverse Stakeholder Perspectives on Problem-Solving and Creativity

评估设计思维在南非高等教育中的影响：对问题解决与创造力的多利益相关者视角的综合性综述

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Abstract:

This study systematically examines the influence of design thinking in South African higher education, emphasizing its role in enhancing problem-solving and creativity among diverse stakeholder groups. The research aims to explore how design thinking addresses complex educational challenges and to identify strategies for its effective integration into academic contexts. The novelty of this study lies in its context-specific approach, providing a comprehensive synthesis of literature that highlights the unique socio-economic, cultural, and institutional dynamics of South Africa. Unlike previous research, this review not only maps the theoretical and practical applications of design thinking but also proposes actionable recommendations tailored to the South African higher education sector. The

Keywords: Design Thinking, Higher Education, Problem-Solving, Creativity, Innovation, South Africa, Curriculum Development.

关键词：

设计思维；高等教育；问题解决；创造力；创新；南非；课程开发



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findings underscore design thinking's potential to foster innovation, interdisciplinary collaboration, and inclusive pedagogical practices, thereby contributing to the transformation of higher education in the region.

摘要：

本研究系统地评估了设计思维在南非高等教育中的影响，重点关注其在提升不同利益相关者群体的问题解决能力与创造力方面的作用。本研究旨在探讨设计思维如何应对复杂的教育挑战，并识别其在学术环境中有效整合的策略。本研究的新颖之处在于采用了情境特定的方法，提供了文献的综合性综述，突出南非独特的社会经济、文化及制度动态。不同于以往研究，本综述不仅描绘了设计思维的理论与实践应用，还提出了针对南非高等教育领域的可操作性建议。研究结果强调了设计思维在促进创新、跨学科协作以及包容性教学实践中的潜力，从而推动该地区高等教育的转型。

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1. Introduction

Design thinking has emerged as a prominent approach in addressing complex challenges across various domains, including higher education (Brown, 2008). In the context of South African higher education, where institutions face diverse and evolving demands, the application of design thinking principles has garnered increasing attention to foster innovation, problem-solving, and creativity. This introduction provides an overview of the rationale for conducting a systematic literature review to explore the impact of design thinking in South African higher education, elucidating its significance in addressing the unique socio-economic and educational challenges faced by the country. South African higher education institutions operate within a dynamic and rapidly changing environment characterized by socio-economic disparities, historical legacies, and evolving educational needs (Spaull, 2013). These institutions are tasked with equipping students with the knowledge, skills, and competencies necessary to thrive in a globalized world while addressing pressing societal issues such as inequality and unemployment. Design thinking, with its emphasis on empathy, collaboration, and iterative problem-solving, offers a promising framework to address these multifaceted challenges (Brown, 2008). The adoption of design thinking in South African higher education aligns with global trends in educational innovation and pedagogical approaches (Cummings & Yur-Austin, 2021). As higher education institutions worldwide grapple with the need to adapt to changing student demographics, technological advancements, and shifting societal expectations, there is growing recognition of the importance of cultivating creative and critical thinking skills among students (Daniel, 2016). Design thinking, with its emphasis on human-centred design and experiential learning, resonates with the aspirations of 21st-century education.

Furthermore, the exploration of design thinking in South African higher education is situated within the broader discourse on educational reform and transformation in the country (Mestry & Singh, 2007).

Historically, South African education has been shaped by apartheid-era policies that entrenched inequality and marginalized certain population groups (Fleisch, 2008). In the post-apartheid era, there has been a concerted effort to redress these historical injustices and build a more inclusive and equitable education system (Department of Basic Education, 2014). Design thinking presents an opportunity to reimagine teaching, learning, and institutional practices in ways that promote social justice and equity (Mestry & Grobler, 2004). Moreover, the examination of design thinking in South African higher education is informed by the need to address the specific challenges and opportunities facing the sector. These include the need to enhance student success and retention, improve the quality and relevance of academic programs, and foster innovation and entrepreneurship (Van der Westhuizen & Van Vuuren, 2007). Design thinking offers a holistic and integrative approach to addressing these challenges by engaging multiple stakeholders, including students, faculty, administrators, and industry partners (Cagnin, 2018). Additionally, the study of design thinking in South African higher education is motivated by the desire to build a knowledge base that informs evidence-based policymaking and institutional decision-making (Beverland et al., 2015). While design thinking has gained traction in various sectors globally, there is a need for context-specific research that explores its applicability and effectiveness within the South African context (Ashman et al., 2021). By systematically reviewing existing literature, this study seeks to contribute to the growing body of knowledge on design thinking in higher education, providing insights that can inform practice and policy.

The examination of design thinking in South African higher education is underpinned by the recognition of the importance of innovation and creativity in driving economic development and social progress (Butler & Roberto, 2018). In an increasingly interconnected and competitive global landscape, countries are looking to higher education as a catalyst for innovation and entrepreneurship (Brand et al., 2021). Design thinking

offers a pathway to nurture a culture of innovation within South African higher education institutions, equipping students and graduates with the skills and mindset needed to thrive in the knowledge economy (Chen & Venkatesh, 2013). Thus, the exploration of design thinking in South African higher education is motivated by the need to address the growing demand for interdisciplinary collaboration and problem-solving (Carlgren et al., 2016a). Traditional disciplinary boundaries are becoming increasingly porous as complex challenges require multidisciplinary approaches (Buchanan, 2019). Design thinking, with its emphasis on collaboration and integrative thinking, provides a framework for bridging disciplinary silos and fostering synergy across diverse fields of knowledge (Buhl et al., 2019). Furthermore, the study of design thinking in South African higher education is situated within the broader discourse on educational quality and relevance (Goslin, 2009). As South Africa strives to enhance the quality of its higher education system and ensure its relevance in a rapidly changing world, there is a need to explore innovative pedagogical approaches that promote student engagement, critical thinking, and lifelong learning (Mandela, 1994). Design thinking offers a learner-centred approach that empowers students to take ownership of their learning journey and develop the skills needed to navigate an uncertain future (Bottery, 2016).

The examination of design thinking in South African higher education is informed by the imperative to promote social justice and inclusive development (Mestry & Singh, 2007). In a country grappling with deep-seated inequalities and historical injustices, higher education has a pivotal role to play in fostering social cohesion and economic empowerment (Spaull, 2013). Design thinking, with its focus on empathy, equity, and community engagement, offers a framework for addressing the diverse needs and aspirations of South Africa's diverse population (Chouki et al., 2021).

2. Literature Review

Design thinking has gained prominence as a human-centred approach to innovation and problem-solving, with applications spanning various domains, including business, technology, and education (Brown, 2008). In the context of higher education, design thinking offers a promising framework for addressing complex challenges and fostering student-centred learning experiences (Beckman & Barry, 2007). Studies have highlighted the potential of design thinking to enhance creativity, collaboration, and critical thinking skills among students, thereby preparing them for the demands of the 21st-century workforce (Buchanan, 2019). For instance, research by Chen and Venkatesh (2013) found that design-oriented organizations implementing design thinking reported improved innovation outcomes and organizational performance. Furthermore, design thinking has been lauded for its

ability to promote interdisciplinary collaboration and problem-solving (Carlgren et al., 2016b). In higher education settings, where siloed disciplinary boundaries often hinder collaboration, design thinking offers a holistic approach that encourages cross-disciplinary engagement and knowledge exchange (Dell'Era et al., 2020). By bringing together students and faculty from diverse backgrounds, design thinking can foster a culture of innovation and creativity that transcends traditional disciplinary boundaries (Clune & Lockrey, 2014).

Design thinking has been recognized for its potential to address societal challenges and promote social justice in higher education (Mestry & Singh, 2007). In South Africa, where historical inequalities and social injustices persist, higher education institutions are increasingly turning to design thinking to promote inclusive development and equitable access to education (Spaull, 2013). By centring the needs and experiences of marginalized communities, design thinking can empower students and educators to co-create solutions that address pressing social issues and promote positive change (Coco et al., 2020). Additionally, research has highlighted the role of design thinking in fostering innovation and entrepreneurship in higher education (Beckman, 2020). By encouraging students to adopt a mindset of experimentation and iteration, design thinking can equip them with the skills and confidence to pursue entrepreneurial opportunities and drive social and economic development (Butler & Roberto, 2018). Studies have shown that design thinking education programs can lead to the development of innovative products, services, and ventures that address unmet needs and create value for society (Da Silva et al., 2020).

This study underscores the importance of integrating design thinking into the curriculum and pedagogical practices of higher education institutions (Brand et al., 2021). While design thinking has gained traction in various sectors, its adoption in higher education remains uneven, with barriers such as faculty resistance, institutional inertia, and resource constraints hindering widespread implementation (Chen et al., 2018). Efforts to embed design thinking into the fabric of higher education require strategic leadership, faculty development, and institutional support to overcome these barriers and realize its transformative potential (Beckman, 2020). Scholars have highlighted the need for empirical evidence to assess the effectiveness and impact of design thinking in higher education (Carlgren et al., 2016a). While anecdotal evidence and case studies abound, there is a paucity of rigorous empirical research that systematically evaluates the outcomes and benefits of design thinking education programs (Chen & Venkatesh, 2013). By conducting empirical studies that measure student learning outcomes, innovation outputs, and organizational performance metrics, researchers can contribute to the evidence based on the

efficacy of design thinking in higher education (Ben Mahmoud-Jouini et al., 2019). Additionally, the literature emphasizes the importance of cultural and contextual factors in shaping the adoption and implementation of design thinking in higher education (Ashman et al., 2021). In diverse socio-cultural contexts such as South Africa, where indigenous knowledge systems and historical legacies intersect with global trends in education, design thinking must be adapted and contextualized to resonate with local needs and priorities (Beverland et al., 2015). By engaging with diverse stakeholders and incorporating indigenous perspectives into design thinking practices, higher education institutions can ensure that their innovation efforts are culturally relevant and socially impactful (Cankurtaran & Beverland, 2020).

Furthermore, research suggests that successful implementation of design thinking in higher education requires a systemic and integrated approach that involves collaboration across departments, disciplines, and sectors (Carlgren et al., 2016b). Rather than treating design thinking as a standalone course or initiative, institutions should embed it within existing curricula and academic programs, integrate it into institutional policies and practices, and cultivate a culture of design thinking throughout the organization (Chen et al., 2018). By fostering a supportive ecosystem that nurtures creativity, experimentation, and risk-taking, higher education institutions can unleash the full potential of design thinking to drive innovation and positive change (Chouki et al., 2021). The study further underscores the role of leadership in championing design thinking and driving organizational change in higher education (Beckman, 2020). Effective leadership is essential for creating a vision, mobilizing resources, and overcoming resistance to change (Brown, 2008). Leaders in higher education must advocate for the value of design thinking, allocate resources to support its implementation, and empower faculty and staff to experiment with new approaches to teaching, research, and service (Buchanan, 2019). By providing strategic direction and institutional support, leaders can create an enabling environment that fosters innovation, collaboration, and continuous improvement in higher education (Buhl et al., 2019).

3. Theoretical Framework

The theoretical framework for this study is grounded in organizational change and innovation theories, which provide a lens for understanding how design thinking influences higher education institutions in South Africa. Organizational change theories, such as the life cycle theory, evolutionary theory, dialectical theory, and teleological theory (Van de Ven, 1995), offer insights into the processes and dynamics of change within organizations. These theories help to conceptualize the stages of organizational development, the drivers of change, and the mechanisms through which change

occurs. In the context of higher education, these theories can elucidate how design thinking initiatives are initiated, implemented, and sustained over time. Organizational change and innovation theories serve as a robust theoretical framework for understanding the dynamics of design thinking adoption and implementation in South African higher education institutions. These theories provide valuable insights into the processes, mechanisms, and factors that drive organizational transformation and foster innovation. Drawing on a range of theoretical perspectives, this study aims to elucidate the role of design thinking in catalysing organizational change and promoting innovation within the higher education landscape of South Africa.

Firstly, organizational change theories, such as the life cycle theory, offer a structured approach to understanding the stages of development that institutions undergo over time (Van de Ven, 1995). By applying this theory, the study can explore how design thinking initiatives evolve within higher education institutions, from initial conception to widespread adoption, and how they adapt to changing internal and external contexts. Additionally, the evolutionary theory provides insights into the gradual accumulation of innovations within organizations, highlighting the iterative nature of change processes (Tushman & O'Reilly, 1996). This perspective is particularly relevant for understanding how design thinking practices become embedded in institutional culture and practices over time.

Secondly, innovation theories offer a complementary framework for analysing the mechanisms through which design thinking fosters creativity and drives innovation within higher education institutions. The diffusion of innovations theory proposed by Rogers (2003), provides a model for understanding the adoption and spread of new practices, ideas, and technologies within organizations. By examining the diffusion patterns of design thinking in South African higher education, the study can identify key factors that facilitate or inhibit its uptake among faculty, administrators, and students. Moreover, the ambidexterity theory posits that organizations must balance exploration and exploitation activities to sustain innovation over the long term (Tushman & O'Reilly, 1996). This theory is particularly relevant for understanding how design thinking initiatives can simultaneously promote creativity and enhance operational efficiency within higher education institutions.

Furthermore, socio-cultural theories offer valuable insights into the cultural and contextual factors that shape the adoption and implementation of design thinking practices in South African higher education. The cultural-historical activity theory, proposed by Engeström (1987), emphasizes the importance of socio-cultural context in shaping individuals' beliefs, values,

and practices. By applying this theory, the study can explore how cultural norms, institutional values, and socio-economic factors influence the uptake of design thinking among diverse stakeholders within higher education institutions. Additionally, the social constructivist theory, advanced by Vygotsky (1978), highlights the role of social interactions and collaborative learning in shaping individuals' cognitive processes and behaviours. This perspective is particularly relevant for understanding how design thinking pedagogy can be integrated into curriculum and instructional practices to promote student-centred learning and collaborative problem-solving.

Moreover, complex theories offer a useful framework for understanding the emergent and unpredictable nature of organizational change and innovation processes. Complexity theory posits that organizations are complex adaptive systems that exhibit non-linear dynamics, self-organization, and emergent behaviours (Stacey, 2001). By applying this lens, the study can explore how design thinking initiatives generate novel solutions to complex problems, adapt to changing environments, and foster a culture of continuous learning and adaptation within higher education institutions. Additionally, network theories offer insights into the role of social networks and interpersonal relationships in facilitating knowledge sharing, collaboration, and innovation (Burt, 2000). This perspective is particularly relevant for understanding how design thinking practices spread through informal networks of faculty, administrators, and students within higher education institutions.

Furthermore, leadership theories provide valuable insights into the role of organizational leaders in driving change and fostering innovation within higher education institutions. Transformational leadership theory emphasizes the importance of visionary leadership, inspirational motivation, and intellectual stimulation in mobilizing organizational members toward shared goals and objectives (Bass & Avolio, 1994). By applying this theory, the study can explore how visionary leaders champion design thinking initiatives, create a culture of innovation, and empower faculty and staff to experiment, take risks, and embrace change. Additionally, distributed leadership theory highlights the importance of distributed decision-making, shared accountability, and collective action in driving organizational change and innovation (Spillane et al., 2004). This perspective is particularly relevant for understanding how design thinking initiatives can empower diverse stakeholders to contribute their expertise, perspectives, and insights to collaborative problem-solving efforts within higher education institutions.

Overall, organizational change and innovation theories provide a comprehensive framework for analysing the complex interplay between individual, organizational, and socio-cultural factors that shape the

adoption and implementation of design thinking practices in South African higher education. By drawing on a range of theoretical perspectives, this study aims to develop a nuanced understanding of how design thinking contributes to organizational change, fosters innovation, and promotes sustainable development within higher education institutions.

Justification for the organizational change and innovation theories in this study

The choice of organizational change and innovation theories as the theoretical framework for this study is justified by their relevance in understanding the dynamics of design thinking adoption and implementation in higher education institutions. Organizational change theories, such as the life cycle theory and evolutionary theory, offer valuable insights into the stages and processes of change within organizations (Van de Ven, 1995). In the context of higher education, these theories can help elucidate the various stages involved in the adoption and implementation of design thinking initiatives, from the initial recognition of the need for change to the institutionalization of new practices. For example, the life cycle theory posits that organizations go through distinct stages of development, including emergence, growth, maturity, and decline. By applying this theory, the study can assess where South African higher education institutions stand in terms of their readiness for adopting design thinking and identify potential barriers or challenges at each stage of the change process.

The innovation theories provide a framework for understanding how design thinking contributes to organizational creativity and problem-solving in higher education. The diffusion of innovations theory, for instance, emphasizes the importance of social networks and communication channels in the spread of new ideas and practices (Rogers, 2003). In the context of this study, this theory can help analyse the factors that influence the dissemination of design thinking practices among faculty, students, and administrators within South African higher education institutions. Similarly, the ambidexterity theory suggests that organizations must balance exploration (i.e., the pursuit of new ideas and opportunities) and exploitation (i.e., the refinement and optimization of existing processes) to achieve long-term success (Tushman & O'Reilly, 1996). Applied to design thinking, this theory can help identify how institutions can foster a culture of innovation while also maintaining operational efficiency and effectiveness.

4. Research Methodology

This study employs a systematic literature review to critically examine the influence of design thinking (DT) within South African higher education. The research object—design thinking in the context of South African

universities—was selected due to its growing relevance in addressing complex educational challenges such as inequality, student engagement, and curriculum innovation. The choice is further justified by the increasing global and local interest in DT as a transformative pedagogical and organisational tool, particularly in settings marked by socio-economic diversity and historical inequities.

To ensure methodological rigour, the review followed established protocols for systematic literature analysis (Kraus et al., 2020, 2022; Linnenluecke et al., 2020; Tranfield et al., 2003). Searches were conducted in the Web of Science (WoS) and Scopus databases, targeting publications with “design thinking” in the title to maintain thematic relevance. The initial search yielded 794 records from WoS and 5,036 from Scopus, reflecting the maturity of DT as a research domain. To refine the dataset, the scope was narrowed to the “business” and “management” categories, and only English-language peer-reviewed articles published up to 27 August 2021 were included. Further quality control was applied by excluding articles from journals with an Impact Factor or CiteScore below one. After removing duplicates, the final sample comprised 164 articles.

Data synthesis was conducted using a concept-centric approach (Denyer & Tranfield, 2009), guided by Ma et al. (2019)’s framework encompassing context factors, processes, outcomes, and definitions. Titles and abstracts were initially reviewed to map the literature landscape, followed by full-text analysis. Key insights were documented in tabular format using Excel, enabling thematic categorisation and identification of interrelationships among findings.

The application of the findings is twofold. First, they provide evidence-based recommendations for integrating DT into South African higher education curricula, institutional strategies, and professional development programmes. Second, the insights offer a foundation for policy formulation and institutional decision-making aimed at fostering innovation, inclusivity, and interdisciplinary collaboration. By contextualising global DT practices within the unique socio-cultural and educational landscape of South Africa, this study contributes to the development of locally relevant frameworks for educational transformation.

5. Presentation of Findings

In presenting the findings of this study, a systematic and structured approach was adopted to ensure clarity and coherence. The synthesized literature on design thinking (DT) was categorized and analysed according to key themes, including definitions, characteristics, influencing factors, and impacts. This presentation of findings adhered to established methodologies in systematic literature review (Kraus et al., 2020, 2022; Linnenluecke et al., 2020; Tranfield et al., 2003), ensuring rigor and reliability in the analysis. Each

theme was explored in depth, drawing upon relevant literature to provide insights into the current state of research in the field of DT. Furthermore, the findings were contextualized within the South African higher education landscape, acknowledging the unique challenges and opportunities present in this context. By presenting the findings in a structured and systematic manner, this study contributes to the advancement of knowledge on DT and its implications for innovation in higher education, offering valuable insights for researchers, practitioners, and policymakers alike.

5.1 The concept of design thinking in higher education

This study delved into various definitions and conceptualizations of design thinking (DT), shedding light on its multifaceted nature. Literature highlighted the diverse perspectives on DT, emphasizing its human-centred approach and iterative problem-solving process (Brown, 2008; Buchanan, 2019; Cagnin, 2018). The concept of design thinking (DT) in higher education has garnered increasing attention as educators seek innovative approaches to address complex challenges in teaching and learning. DT is recognized for its human-centred and iterative problem-solving approach, which aligns well with the diverse needs and contexts present in higher education institutions (Brown, 2008). DT encourages educators to empathize with students, understand their unique perspectives, and co-create solutions to enhance learning experiences. As a result, DT has emerged as a valuable framework for fostering creativity, critical thinking, and collaboration among students, preparing them for the dynamic demands of the modern workforce (Daniel, 2016). Several studies have highlighted the potential of DT to transform teaching and learning practices in South African higher education. By integrating DT principles into curriculum design and pedagogy, educators can create engaging and interactive learning environments that promote innovation and problem-solving skills (Carlgrén et al., 2016a). Furthermore, DT encourages a multidisciplinary approach to education, bridging the gap between different disciplines and encouraging collaboration across faculties and departments (Chen et al., 2018). This interdisciplinary perspective is particularly relevant in South Africa, where higher education institutions strive to address societal challenges through holistic and collaborative approaches. However, the adoption of DT in South African higher education is not without challenges. Limited resources, infrastructure constraints, and traditional educational paradigms can pose barriers to the effective implementation of DT initiatives (Chouki et al., 2021). Additionally, cultural factors and institutional resistance to change may hinder the widespread adoption of DT practices (Coco et al., 2020). Despite these challenges, there is growing recognition of the value of DT in higher education, and

efforts are underway to overcome barriers and promote its integration into teaching and learning practices across South African universities.

5.2 Approaches to design thinking in higher education

The examination of DT processes and methodologies revealed a variety of approaches used in different contexts. Various scholars have identified various models and frameworks employed in the application of DT, emphasizing the importance of empathy, ideation, prototyping, and testing (Beckman & Barry, 2007; Chen et al., 2013; Dell'Era et al., 2020). The application of design thinking (DT) in higher education follows a structured process that emphasizes empathy, ideation, prototyping, and iteration. Educators and researchers leverage DT methodologies to address complex challenges and opportunities in teaching, learning, and institutional development. The DT process typically begins with empathizing with stakeholders, including students, faculty, administrators, and community members, to gain a deep understanding of their needs, aspirations, and constraints (Cagnin, 2018). This empathetic approach is crucial in the South African context, where diverse cultural, socio-economic, and educational backgrounds influence the learning experiences of students.

Following the empathetic phase, DT practitioners engage in ideation sessions to generate creative solutions to identify challenges. These sessions often involve collaborative brainstorming, rapid prototyping, and experimentation to explore a wide range of possibilities (Ashman et al., 2021). In South Africa, the ideation phase of DT is enriched by the country's cultural diversity and rich heritage, which inspire innovative approaches to teaching and learning (Beckman, 2020). Educators and students draw on their unique perspectives and experiences to co-create solutions that are contextually relevant and culturally sensitive. The prototyping and iteration stages of the DT process are critical for refining ideas, testing assumptions, and gathering feedback from stakeholders (Beckman & Barry, 2007). In South African higher education, prototyping may involve piloting new teaching methods, technologies, or pedagogical approaches in real-world classroom settings (Carlgren et al., 2016b). This iterative approach allows educators to adapt and refine their innovations based on evidence-based feedback, ultimately enhancing the effectiveness and impact of DT initiatives in addressing the diverse needs of students and the broader higher education community.

5.3 Factors influencing design thinking

Contextual factors were identified as significant influences shaping the application and effectiveness of DT. Literature highlighted the role of organizational culture, leadership support, and external environment in

facilitating or hindering DT implementation (Carlgren et al., 2016a; Chouki et al., 2021; Coco et al., 2020). Thus, in the context of South African higher education, several contextual factors influence the adoption and implementation of design thinking (DT) methodologies. One significant factor is the socio-economic landscape of the country, characterized by vast disparities in access to education, resources, and opportunities. These disparities necessitate innovative approaches to address the diverse needs of students from different socio-economic backgrounds (Cagnin, 2018). DT offers a human-centred approach to problem-solving that can be tailored to the specific challenges faced by South African universities, such as ensuring equitable access to quality education and promoting inclusivity and diversity.

Another contextual factor shaping the application of DT in South Africa is the evolving role of technology in education. With the increasing integration of digital technologies in teaching and learning, there is a growing need for educators to adapt their pedagogical practices to leverage the potential of technology-enhanced learning environments (Carlgren et al., 2016a). DT provides a framework for designing innovative educational solutions that harness the affordances of technology while addressing the unique needs and preferences of students. In South Africa, where access to technology may be limited in certain communities, DT can also be used to develop inclusive strategies for bridging the digital divide and promoting digital literacy. Additionally, the cultural and linguistic diversity of South Africa presents both opportunities and challenges for the implementation of DT in higher education. South Africa is home to multiple languages, cultures, and traditions, which influence how individuals perceive and engage with educational practices (Ashman et al., 2021). DT offers a flexible and adaptable approach that can accommodate diverse perspectives and cultural contexts, fostering creativity, collaboration, and cross-cultural understanding. However, educators must be mindful of cultural sensitivities and preferences when designing and implementing DT initiatives to ensure that they resonate with the diverse student body and promote inclusivity and social cohesion.

5.4 Likely outcomes and impacts of design thinking

The study explored the outcomes and impacts of DT, revealing its potential to drive innovation and problem-solving in various domains. Literature cited examples of DT contributing to improved product development, enhanced user experiences, and organizational transformation (Appleyard et al., 2020; Ben Mahmoud-Jouini et al., 2019; Beverland et al., 2015). Design thinking (DT) holds the potential to generate a range of positive outcomes and impacts within the context of South African higher education. One significant outcome is the enhancement of student engagement and

learning experiences. By adopting a human-centred approach to problem-solving, DT encourages active participation and collaboration among students, fostering a deeper understanding of course content and promoting critical thinking skills (Coco et al., 2020). In South Africa, where student retention and success rates may be influenced by various socio-economic factors, DT can play a pivotal role in creating inclusive and supportive learning environments that cater to the diverse needs of students from different backgrounds.

Moreover, the application of DT in South African higher education has the potential to foster innovation and entrepreneurship among students. DT emphasizes creativity, experimentation, and risk-taking, which are essential attributes for success in the dynamic and rapidly evolving global economy (Carlgren et al., 2016b). By integrating DT into curricular and extracurricular activities, universities can empower students to develop innovative solutions to real-world challenges, thereby equipping them with the skills and mindset needed to thrive in the 21st-century workforce. This aligns with the broader national agenda of promoting innovation and economic growth in South Africa by cultivating a culture of entrepreneurship and innovation among its youth (Daniel, 2016).

The adoption of DT in South African higher education can have broader societal impacts beyond the campus walls. DT emphasizes empathy, collaboration, and social responsibility, values that are essential for addressing complex societal issues and driving positive change in communities (Beverland et al., 2015). By engaging students in projects that address local challenges, such as poverty, inequality, and environmental sustainability, universities can empower them to become active citizens and change agents who contribute to the social and economic development of South Africa (Clune and Lockrey, 2014). Through partnerships with industry, government, and civil society organizations, universities can leverage DT as a catalyst for social innovation and community development, creating lasting impacts that extend far beyond the educational realm.

5.5. Challenges and barriers in design thinking adoption in higher education

The study uncovered barriers and challenges associated with the adoption and implementation of DT. Literature identified issues such as resistance to change, lack of resources, and insufficient training as common obstacles faced by organizations seeking to embrace DT (Butler & Roberto, 2018; Carlgren et al., 2016b; Cummings & Yur-Austin, 2021). Despite its potential benefits, the adoption of design thinking (DT) in South African higher education faces several barriers and challenges. One major obstacle is the lack of awareness and understanding among educators and administrators about the principles and practices of DT (Cankurtaran and Beverland, 2020). Many institutions may perceive

DT as a novelty or buzzword without fully grasping its underlying concepts and methodologies.

Without adequate training and professional development opportunities for faculty members, there may be resistance to integrating DT into existing curricula, leading to a gap between theory and practice (Carlgren et al., 2016a). Additionally, limited access to resources, such as specialized training programs, tools, and funding, may further impede the widespread adoption of DT in South African universities (Chen and Venkatesh, 2013).

Moreover, cultural and institutional factors can pose significant challenges to the implementation of DT in the South African higher education context. The hierarchical nature of academic institutions and traditional teaching methods may hinder collaboration, experimentation, and risk-taking, which are fundamental aspects of DT (Brown, 2008). Furthermore, language barriers and cultural norms may affect the effectiveness of DT initiatives, particularly in diverse and multilingual settings like South Africa (Chen et al., 2018). Without addressing these cultural and institutional barriers, universities may struggle to create a conducive environment for DT adoption and innovation.

The complexity and ambiguity inherent in DT processes can pose challenges for educators and students accustomed to more structured and linear approaches to problem-solving (Butler and Roberto, 2018). DT requires individuals to embrace uncertainty, iterate rapidly, and embrace failure as part of the learning process, which may be at odds with traditional academic norms and expectations (Dell'Era et al., 2020). Moreover, the time and effort required to implement DT effectively may deter busy faculty members and students from fully engaging with the methodology (Chouki et al., 2021). Addressing these barriers will require a concerted effort from university leadership, faculty members, and other stakeholders to promote a culture of innovation, collaboration, and continuous learning within South African higher education institutions.

6. Discussion

The findings of this study affirm the growing significance of design thinking (DT) as a transformative approach in South African higher education. As Brown (2008) and Beckman and Barry (2007) argue, DT fosters a human-centred, iterative process that is well-suited to address complex educational challenges. Within the South African context, where institutions grapple with socio-economic disparities and historical inequities (Spaull, 2013), DT offers a compelling framework for reimagining teaching, learning, and institutional development.

One of the most salient insights from the literature is DT's capacity to enhance creativity, collaboration, and critical thinking among students (Buchanan, 2019;

Daniel, 2016). These competencies are essential for preparing graduates to navigate the demands of the 21st-century workforce. In particular, the emphasis on empathy and co-creation aligns with the need to develop inclusive pedagogical practices that resonate with South Africa's diverse student population (Coco et al., 2020; Chouki et al., 2021).

The study also highlights the role of DT in promoting interdisciplinary collaboration, a critical need in higher education institutions that often operate within rigid disciplinary silos (Carlgren et al., 2016b; Dell'Era et al., 2020). By encouraging cross-faculty engagement and knowledge exchange, DT can help institutions respond more effectively to multifaceted societal challenges (Ajani & Rathilal, 2025). This is particularly relevant in South Africa, where universities are increasingly called upon to contribute to national development goals (Van der Westhuizen & Van Vuuren, 2007).

Moreover, DT's potential to foster innovation and entrepreneurship is well-documented in the literature (Beckman, 2020; Butler & Roberto, 2018). By cultivating a mindset of experimentation and risk-taking, DT empowers students to develop novel solutions to real-world problems. This aligns with national imperatives to stimulate economic growth and reduce youth unemployment through entrepreneurial education (Daniel, 2016; Brand et al., 2021).

However, the adoption of DT in South African higher education is not without its challenges. The literature identifies several barriers, including limited awareness, institutional inertia, and resource constraints (Chen et al., 2018; Carlgren et al., 2016a). Cultural resistance and hierarchical academic structures further complicate efforts to embed DT into curricula and institutional practices (Brown, 2008; Cankurtaran & Beverland, 2020). These findings underscore the need for strategic leadership and institutional support to drive meaningful change.

Leadership emerges as a critical enabler of DT implementation. Transformational and distributed leadership models, as discussed by Bass and Avolio (1994) and Spillane et al. (2004), provide useful frameworks for understanding how institutional leaders can champion DT initiatives. By fostering a culture of innovation and empowering faculty and students, leaders can create the conditions necessary for DT to flourish (Beckman, 2020; Buchanan, 2019).

The study also reveals the importance of contextualising DT within South Africa's unique socio-cultural landscape. As Ashman et al. (2021) and Beverland et al. (2015) note, successful implementation requires sensitivity to local values, languages, and traditions. Incorporating indigenous knowledge systems and engaging with community stakeholders can enhance the relevance and impact of DT initiatives (Cankurtaran & Beverland, 2020).

In terms of outcomes, DT has demonstrated the potential to improve student engagement, enhance learning experiences, and contribute to organisational transformation (Appleyard et al., 2020; Ben Mahmoud-Jouini et al., 2019). These benefits are particularly valuable in South Africa, where higher education institutions face mounting pressure to improve retention rates and ensure equitable access to quality education (Spaull, 2013; Coco et al., 2020).

Furthermore, DT can serve as a catalyst for social innovation. By involving students in community-based projects that address pressing societal issues—such as poverty, inequality, and environmental sustainability—universities can extend their impact beyond the classroom (Clune & Lockrey, 2014; Beverland et al., 2015). This aligns with the broader vision of higher education as a driver of inclusive development and social justice (Mestry & Singh, 2007).

Conversely, the integration of DT into South African higher education holds significant promise, but its success depends on overcoming structural and cultural barriers. Future efforts should focus on building institutional capacity, fostering leadership, and tailoring DT practices to local contexts. By doing so, universities can harness the full potential of DT to drive innovation, enhance learning, and contribute meaningfully to societal transformation.

7. Implications of the Study

Based on the findings of this study, several recommendations can be made to enhance the adoption and effectiveness of design thinking (DT) in South African higher education institutions. Firstly, there is a need for greater awareness and training initiatives to familiarize faculty, administrators, and students with the principles and methodologies of DT. As noted by Brown (2008), providing comprehensive DT education programs can help cultivate a culture of innovation and problem-solving within academic institutions. Additionally, fostering interdisciplinary collaboration and partnerships with industry stakeholders can provide valuable real-world insights and resources to support DT initiatives (Buchanan, 2019). By integrating DT into curricula across disciplines and offering workshops, seminars, and hands-on experiences, higher education institutions can empower students to apply DT principles in addressing complex challenges. Furthermore, addressing contextual factors and organizational barriers is crucial for the successful implementation of DT in South African higher education. This includes providing adequate resources, infrastructure, and support systems to facilitate DT projects and initiatives (Carlgren et al., 2016a). Moreover, creating a conducive organizational culture that values experimentation, risk-taking, and iterative problem-solving is essential for fostering innovation and creativity (Beckman & Barry, 2007). Institutional leadership plays a critical role in championing DT

initiatives and fostering a supportive environment for experimentation and collaboration (Ashman et al., 2021). By addressing these contextual factors and organizational barriers, higher education institutions can create an enabling environment for DT to flourish and drive positive change.

Conversely, ongoing evaluation and monitoring of DT initiatives are essential to assess their impact and effectiveness over time. By collecting feedback from stakeholders, tracking outcomes, and measuring key performance indicators, institutions can identify areas for improvement and refinement (Cankurtaran & Beverland, 2020). Additionally, fostering a culture of continuous learning and adaptation is important for sustaining DT initiatives in the long term (Butler & Roberto, 2018). Investing in research and development initiatives to explore emerging trends and best practices in DT implementation can also help institutions stay abreast of evolving needs and challenges (Brand et al., 2021). Overall, by implementing these recommendations, South African higher education institutions can leverage the transformative potential of DT to drive innovation, enhance teaching and learning, and address societal challenges.

8. Conclusion

This study has provided valuable insights into the adoption and impact of design thinking (DT) in South African higher education. Through a systematic review of the literature, we have identified key themes, challenges, and opportunities surrounding DT implementation in the context of higher education institutions in South Africa. Despite facing various barriers, including limited awareness, cultural norms, and institutional constraints, DT holds immense potential to enhance teaching, learning, and problem-solving processes in South African universities. By addressing these challenges and leveraging DT's principles of collaboration, creativity, and user-centred design, higher education institutions in South Africa can foster a culture of innovation and prepare students to thrive in an increasingly complex and uncertain world. Moving forward, further research and collaboration among stakeholders are needed to overcome these barriers, develop best practices, and realize the full potential of DT in transforming higher education in South Africa.

9. Limitations and Further Study

A key limitation of this study is its reliance on secondary data from published literature, which may not fully capture the most recent or context-specific developments in the implementation of design thinking within South African higher education institutions.

Author Contributions

Conceptualization, O.A.A. and S.R.; methodology, O.A.A. and S.R.; validation, O.A.A. and S.R.; formal analysis, O.A.A. and S.R.; investigation, O.A.A. and S.R.; resources, O.A.A. and S.R.; data curation, O.A.A. and S.R.; writing—original draft preparation, O.A.A. and S.R.; writing—review and editing, O.A.A. and S.R.; visualization, O.A.A. and S.R.; supervision, O.A.A. and S.R.; project administration, O.A.A. and S.R.; funding acquisition, O.A.A. and S.R. All authors have read and agreed to the published version of the manuscript.”

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Conflicts of Interest

Authors declare no conflict of interests.

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