Journal of Ecohumanism
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

# Harnessing Systems Thinking For Fundamental Change at an Institution of Higher Education in South Africa

KC Moloi[1], AK Isabirye[2]

**Abstract**

*In the face of increasingly complex challenges, contemporary institutions of higher education necessitate holistic and adaptive strategies for transformative change. This theoretical article explores the application of systems thinking as a foundational framework for enhancing effective organisational transformation within South African higher education institutions. Using literature review as the qualitative research genre, we systematically gathered information from reputable databases such as JSTOR, Scopus, PubMed, and Google Scholar to explore the principles of systems thinking and Senge's Five Disciplines. The objective guiding our data search was to identify how systems thinking can address organizational dynamics and contribute to comprehensive change in practices, attitudes, and values. Our findings reveal that viewing organisations as dynamic, interconnected systems not only enhances leaders' adaptability and decision-making processes but also promotes sustainable growth and organisational development. Through a thorough examination of systems thinking concepts, we underscore their efficacy in diagnosing organisational challenges, fostering collaborative interdepartmental relationships, and nurturing a culture of continuous learning. Based on our analysis, we recommend that South African universities embrace systems thinking as a critical approach to initiate and sustain fundamental change. The study ultimately advocates for a paradigm shift towards systems thinking, positioning it as essential for navigating the complexities of modern higher education environments and realizing institutional goals.*

**Keywords:** *Systems thinking, Hall's Iceberg Model, Senge's Five Disciplines, change leadership, interconnectedness, causality.*

## Introduction

Leaders in higher education regularly find themselves at the intersection of change, torn between their institution's history and culture, the intrinsic value of education, market needs, and the desires of alumni, current, and prospective students (Petersen & Barlett, 2020). Fundamental change is a significant alteration or transformation in the core nature or foundation of something, representing a profound shift that affects the essence of a thing rather than just a superficial modification (Du Plooy & von Moellendorff, 2024; Errida & Lofti, 2021; Hurst & Du Plooy, 2021). This type of change can involve major shifts and reorientations in systems, goals, incentives, collaborative teamwork, technologies, social practices, knowledge systems, governance, management, and leadership approaches within a university (Bacchoo & Mishra, 2024), Juříková, Kocourek & Káčerková, 2024; Hurst & Du Plooy, 2021). Errida and Lofti (2021) suggest that, in an increasingly complex, unpredictable, and dynamic global environment, universities continually strive to change and adapt their operations to circumstances as they evolve. The complexity of turbulence is fueled by increasingly urgent and large-scale social and environmental crises, and the call for thinkers to reimagine the world in new ways has become insistent (Hurst & Du Plooy, 2021). Furthermore, Juříková, Kocourek and Káčerková. (2024) offer that universities and their communities are becoming more aware of the role of academic institutions in creating the future, and there is an increase in interest regarding University Social Responsibility (USR) as an area of study. For Hurst and Du Plooy (2021), higher education must develop a new epistemology for a milieu of supercomplexity. Such an epistemology must enable universities to negotiate the super-complexities of multiple, competing theoretical frames and practical (ethical) life (Hurst & Du Plooy, 2021).

The researchers argue that employing a systems thinking approach is ideal to manage the ensuing complex and turbulent environment within and outside the university. Systems thinking is a set of general principles spanning fields as diverse as physical and social sciences, engineering, and management (Senge, 2006). Amissah, Gannon & Monat (2020) view systems thinking as an approach to reasoning and treatment of

[1] Vaal University of Technology, Faculty of Management Sciences, South Africa. Email: khadijah.moloi@madinainstitute.ac.za. ORCID: 0000-0002-6343-6777
[2] Vaal University of Technology, Faculty of Management Sciences, South Africa. Email: isabiryeaki@gmail.com. ORCID: 0000-0003-3601-2241

Journal of Ecohumanism
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

real-world problems based on the fundamental notion of a system. Thelen, Fruchtman, Bilal, Gabaake, Iqbal, Keakabetse, Kwamie, Mokalake, Mupara, Seitio-Kgokgwe, Zafar, and Cobos Muñoz (2023); Senge (2006); Schumacher (n.d. 5) suggest that systems thinking is a cornerstone discipline that focuses on recognising interdependencies and the behavioral changes stemming from system structures. Senge (2006) defines systems thinking as a framework for understanding the interrelationships and patterns within a system, rather than focusing on individual components in isolation. He emphasizes the importance of seeing the whole and understanding how parts are interconnected and influence each other (Senge, 2006). Systems thinking enables observation of interconnected systems from multiple levels and perspectives, extending beyond simple cause-and-effect relationships. Schumacher (n.d.) indicates that systems thinking is the practice of examining and improving our mental models for dealing with complex problem-solving. Arnold and Wade (2015) suggest that through four fundamental concepts: interconnectedness, synthesis, feedback loops, and causality, systems thinking is widely regarded as critical for addressing the complexity the world will face in the coming decades. Given that change is a complex process, it still resides on the educational margins.

This paper examines how harnessing systems thinking can lead to fundamental change in institutions of higher education in South Africa. To achieve this objective, a comprehensive literature review was conducted. Initially, we identify two key frameworks of systems thinking that guide the study. We then clarify systems thinking to provide context for discussion. This is followed by an exploration of the application of systems thinking in higher education. Next, we discuss how fundamental change can be realized through systems thinking at the university. We then address resistance to change. Leadership for fundamental change is analysed, followed by challenges and pitfalls associated with adopting systems thinking in higher education. Finally, we present recommendations for further studies.

**Problem Statement**

It is well documented that universities must perform at high levels through strong teaching, impactful research, student success, and a positive learning environment (Dlamini, 2024; Sikhakhane, 2021). Universities are expected to foster critical thinking, develop innovative skills, and promote intellectual growth while ensuring students achieve high academic standards (Ahmad & Siddiqui, 2019). While this is the case, the university studied has, over the years, insisted, through its strategic direction, strategic objectives, vision, and mission, that academics produce meaningful research, effective teaching and learning, and engage in community outreach. However, in the past few years, several problems have impeded the achievement of strategic objectives and goals. These problems include:

(i) Resource constraints: there are budget cuts, and the lecturers cannot buy new laptops and projectors for teaching and learning.

(ii) Limited facilities or infrastructure: Lecturers complain about poor lecture halls. There are no lights, no air conditioners, and the student desks are broken.

(iii) High student numbers. Large class sizes strain lecturers in terms of teaching and evaluating written tasks.

(iv) Research pressures: There is pressure to raise research output, but most lecturers cannot write and publish.

(v) Administrative burden: Institutional bureaucracy hits hard. Some simple tasks take time to be solved because of reporting lines, central policies, and administrative tasks that take time away from work. Daily meetings are also a burden and time-wasting.

(vi) Conflict resolution: Mediating between staff, students, and lecturers is almost a daily challenge, particularly around transformation.

Journal of Ecohumanism
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

(vii) Frequent student unrest and disruption of classes due to dissatisfaction with the government's financial aid contribute to the problems experienced.

In the researchers' schema, these problems are systemic. This paper intends to address the following: How can systems thinking be implemented for fundamental change at the institution to address these problems? The problems stated are relevant for several reasons. Ahmad and Siddiqui (2019) suggest that contemporary society worldwide has high expectations of the contribution universities can make in helping people learn to live with change, lead change, manage change, and support improvement in all spheres of life in Higher Education. These attempts, correlated initiatives, and activities should not exclusively focus on research matters, but consideration should be given to learning and teaching. Additionally, Sikhakhane (2021) suggests that inadequate research support systems result in researchers facing significant administrative burdens. Some research governance and regulatory frameworks are cumbersome, making it difficult to pursue a research career in such an environment. If the recurring issues are not addressed, the university will continue to underperform compared to its peers. The consequences of underperformance will be felt by all staff members (academic, administrative, and general workers), students, parents, and the broader community. The problems stated are systemic and thus require a systems approach to address them. This paper examines how to harness systems thinking for fundamental change at a higher education institution in South Africa.

## Theoretical Framework: Key Systems Thinking Frameworks

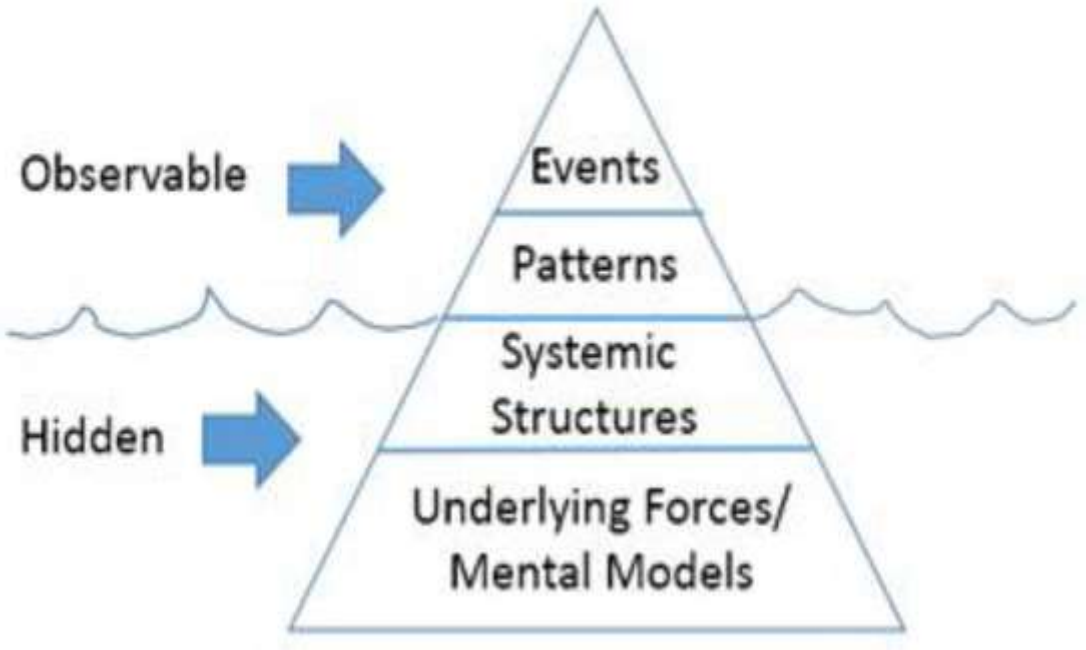
Numerous useful systems thinking frameworks, associated models, and tools that can create scaffolding for diagnosing issues, mapping complex systems, and analysing dynamics and patterns over time, are available. For this paper, two foundational frameworks, the Iceberg Model and Senge's Five Disciplines model, are adopted to unpack how systems thinking can influence fundamental change at an institution of higher education in South Africa. The researchers decided to use two models because, as articulated by Errida and Lofti (2020), the use of a single model is not sufficient to cover various change situations, and certain factors may be omitted or neglected, which could fail if the model is inappropriate to the change context. Consequently, integrating the Iceberg Model and Senge's Five Disciplines model, the researchers believe, may lead to an integrated understanding of how to ensure successful implementation of systems thinking to bring about fundamental change at the institution. We first discuss the Iceberg Model as a useful systems thinking tool for fundamental change, followed by a discussion of Senge's Five Disciplines model.

The iceberg model, specifically the cultural iceberg, was developed by anthropologist Edward T. Hall in 1976. He used the analogy of an iceberg to explain that culture is composed of visible and invisible elements. In the 1970s, American anthropologist Edward T. Hall developed the iceberg theory of culture, which states that the viewed, observed, and experienced parts of culture constitute 10% of the entire cultural context of a society. Therefore, 90% of the culture is invisible and made up of beliefs and perspectives in the minds of individual members of society (Hall, 1976). Similarly, an iceberg is defined much more by what is under the surface of the water than by what is readily apparent to the senses (Hall, 1976). The Iceberg model was later adapted and evolved by systems and management theorists. The Iceberg Model is useful for explaining how fundamental change can be achieved through systems thinking.

The Iceberg model serves as an important metaphor for what we see or observe versus the influential yet often hidden drivers of systemic issues (Mahringer, Schmiedle, Albicker & Mayer, 2025). Like an iceberg floating in water, only about 10% of its total mass is visible above the surface, while 90% of the iceberg's bulk and shape lies unseen underwater (Hall, 1976). In the systems thinking iceberg model, events represent visible, often sudden problems or incidences that capture attention (The Core Collaborative, 2024). However, a systems thinking approach tries to understand what lies beneath the symptoms by diving down the iceberg. **"**Patterns**"** refer to trends, sequences, and behaviours over time – that is how and why events keep recurring. By studying patterns, we can begin anticipating and getting ahead of issues rather than just reacting (Senge, 2006).

Journal of Ecohumanism
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

**Iceberg Model**




**Source:** Hall, E. T. (1976). *Beyond Culture*. Garden City, NY: Anchor Press.

The iceberg model helps to answer questions like: What am I not seeing here? What's under the iceberg that I don't understand? These questions help grasp the behaviours in the whole system – the university. According to Hall (1976), at the base of the iceberg are mental models operating as the taken-for-granted beliefs and assumptions that justify and reinforce particular structures and policies that may not be working well or serving stated goals. Palmunen, Lainema, and Pelto (2021) suggest that mental models are cognitive representations of reality linked to how we know, perceive, make decisions, and behave in various contexts. In the university context, mental models represent understanding of the business environment by the leadership, academics, and other employees and how the leadership influences their strategic choices to lead higher-quality heuristics and better performance. By re-examining deeply ingrained mindsets (mental models), we can identify needed shifts to enact substantive and sustainable change. Hall's (1976) view of mental models philosophy corroborates with Senge's (2006) explanation of mental models. For Senge (2006), mental models refer to the deeply ingrained assumptions, generalizations, or even pictures and images we hold about ourselves, others, and the world, which shape how we understand situations and make decisions. These mental models often operate unconsciously and can significantly influence our behaviours and perceptions, sometimes limiting our ability to see things differently or adjust to new situations. These mental models are hard to change. Any fundamental change within the university must address the mental models (Palmunen, Lainema & Pelto, 2021). Cultural change in higher education refers to shifts in the beliefs, values, practices, and overall environment (Kezar, Hallett & Hypolite, 2025). These changes can be intentional, driven by strategic initiatives, or arise naturally in response to societal shifts or internal challenges (Petersen & Barlett, 2020). The changes can involve anything from curriculum reform and teaching methodologies to institutional policies and student support services. Petersen & Barlett (2020) further argue that leaders in higher education can implement change that is incongruent with organisational culture while maintaining harmony among the institution's ideals and constituents.

Senge's (2006) five learning disciplines model, centered around systems thinking, is relevant as a theoretical framework for this paper. The five disciplines are systems thinking, personal mastery, mental models, shared vision, and team learning. For Senge (2006), each discipline builds skills needed for effectively analysing complexity and catalysing change. Personal mastery emphasizes continually clarifying and deepening personal vision, purpose, and understanding the current reality more clearly. It's about fostering a lifelong

Journal of Ecohumanism
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

commitment to learning and acquiring expertise. Mental models involve reflecting on internal assumptions and generalisations that influence how we comprehend the world. By unearthing mental models, we can identify areas that limit our understanding to integrate divergent perspectives. Senge's (2006) view about mental models corroborates Hall's (1976) Iceberg model, which depicts hidden behaviour as underlying forces that are not easily observable. These underlying forces are the hardest to change because they are deeply ingrained beliefs and assumptions. Senge (2006) thus asserts that mental models describe people's internal belief systems about how parts of the world work. They shape how we interpret problems and opportunities. By examining our mental models and those of others, we can identify flawed assumptions or areas of disagreement that may limit shared understanding of a complex university situation. These interrelated concepts underscore why systems behave in nonlinear and unpredictable ways. By studying patterns and interrelationships, systems thinking aims to anticipate potential impacts of changes over varying timelines.

Senge (2006) suggests that a shared vision cultivates a sense of group commitment by developing images of a desired future state that fosters energy and engagement rather than mere compliance. A shared vision aligned with guiding ideas and a shared purpose can provide focus and priority for systems-level change (Thelen, Fruchtman, Gabaake, Iqbal, Keabetse, Kwamie, Mokalake, Mupara, Seitio-Kgokgwe, Zafar & Cobos Muñoz, 2023). Team learning occurs when teams come together to thoughtfully address complex issues (Rehbock, Krafft, Sommer, Beumer, Beckers, Thate, Kaminski, & Ziemann, 2023). In line with systems thinking techniques, team learning cultivates skills in openly sharing perspectives, allowing insights unattainable individually (Senge, 2006). It harnesses collective wisdom for collaborative problem-solving and is essential for facilitating change within systems (Amissah, Gannon & Monat, 2020). Together, these mutually reinforcing disciplines promote systemic thinking to perceive increasingly complex forces of change while actively engaged in collective action to foster fundamental change. The collection can be engendered through Thelen, et al.'s (2023) six key characteristics of systems thinking: (i) recognising and understanding interconnections and system structure, (ii) identifying and understanding feedback, (iii) identifying leverage points, (iv) understanding dynamic behaviour, (v) using mental models to suggest possible solutions to a problem and (vi) creating simulation models to test policies.

The two models adopted for this paper help us understand what needs to change and how the change process should unfold within the institution. For fundamental change to occur, the researchers believe that learning leaders must develop knowledge capital to network and collaborate with other leaders and subordinates to position the institution for transformation (Whittaker and Montgomery, 2022). Establishing a collaborative learning culture encourages the development of a systems thinking culture (Kezar, Hallet, Corwin & Hypolite, 2025; Bacchoo & Mishra, 2024). The practical steps for cultivating a systems thinking culture involve, among other things, self-managing teams, problem-solving, and empowerment for transformation (Juříková, Kocourek & Káčerková, 2024; Whittaker & Montgomery, 2022). The theoretical framework synthesizes cultural visibility (via the Iceberg Model) with systemic learning and growth (through Senge's Five Disciplines), providing a holistic tool for diagnosing and nurturing organizational culture for fundamental change. Combining the two models and their adaptability can serve as an analytical tool and a strategic guide for promoting sustainable change within the university.

## Literature Review

Brankovic and Cantwell's (2022) research indicates that higher education studies give considerable attention to understanding change and managing larger, more complex higher education institutions and systems. Systems change involves webs of interdependence. The researchers raise the question: How do we address vexing problems and gain insight into what we might do differently? How can we examine behavioral patterns and attitudes from a different perspective, and what influences these? How can we observe how things unfold over time? Does systems thinking work in teams? How can we view the larger systems instead of experiencing fragmentation and silos in our daily and strategic operations at the university? Understanding systems thinking involves recognizing the interconnectedness and interdependency of phenomena (Hurst & Du Plooy, 2021) and that changes in one area can have ripple effects throughout the entire system (Somasundaram & Rasul, 2019).

Journal of Ecohumanism
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

## Systems thinking

According to Lean Six Sigma Training Certification (2024), a systems thinking framework examines relationships, perspectives, boundaries, and the whole, rather than solely considering events or isolated parts. Systems thinking emphasizes how a change in one area can impact other areas and how systems self-correct over time through feedback, rather than merely analysing isolated occurrences within a system (Sinusoid, 2022; Veletsianos, 2020). Systems thinking goes beyond linear thinking and encourages a holistic view of problems, considering all relevant factors and relationships, moving away from linear, cause-and-effect thinking to embrace complexity and feedback loops (Sinusoid, 2022). Systems thinking helps identify leverage points by understanding the dynamics of a system (Rehbock et al., 2023). It helps identify places where small changes can generate a significant impact (Davies, 2024). Davies (2024a) suggests that systems thinking is a useful approach for tackling wicked problems and enabling more holistic solutions. A system's constituent elements may behave differently when separated from the system's surroundings, or other elements are fundamental to systems theory. Davies (2024a); Żywiołek, Tucmeanu, Tucmeanu, Isac, and Yousaf 2022); Stanescu, Zbuchea, and Pinzaru (2021); Bosch (2020); Westover (2020); Amissah, Gannon & Monat (2019) suggest that six core concepts of systems thinking comprise:

- **Interconnectedness:** Recognising that all parts of a system are interrelated and that changes in one part can impact the entire system. Projects and people are connected. A systems thinking approach identifies those connections and considers all of them.

- **Feedback loops:** Understanding how actions and reactions within a system create cycles of influence, both positive (reinforcing) and negative (balancing).

- **Dynamic complexity:** It acknowledges that systems evolve, and that their behaviour can be influenced by various factors, delays, and nonlinear relationships.

- **System boundaries:** Identifying the system's scope being analysed, including its elements, interconnections, and interactions with the external environment.

- **Emergence:** Recognising that systems can exhibit behaviours that are more than the sum of their parts, which arise from the interactions between those parts. This is the phenomenon of a larger idea, function, property, or outcome that results from the interaction of smaller parts within the organisation. It often provides a better solution than could be gleaned from simply examining the individual parts in isolation. Similarly, the concept of emergence relates to the outcomes of synergies that can come about as the elements of a system interact with each other in nonlinear ways. In the workplace, this often takes the form of the push and pull that happens due to organisational politics and competing priorities.

- **Causality:** Understanding the causal relationships within a system, including direct and indirect effects, and how these relationships contribute to system behavior.

- **Systems mapping:** Using visual tools to represent the elements, interconnections, and feedback loops within a system. Westover (2020) offers that systems mapping is a tool that systems thinkers can use to identify and visually map out the many interrelated elements of a complex system, which will help them "develop interventions, shifts, or policy decisions that will dramatically change the system most effectively. By visually laying out the key inputs and outputs, all of the stakeholders, and the directions of the flows of information and influence, you can visually start to see and more deeply understand the nonlinear complexity of the given system, which can help you make appropriate adjustments to workplace policy, practice, and associated systems in your organisation.

Journal of Ecohumanism
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

According to the Lean Six Sigma Training Certificate (2024), Amissah, Gannon, and Monat (2020), the goal of systems thinking is to understand the entire system and the fundamental relationships between its components that give rise to systemic behaviors. Westover (2020) asserts that interconnectedness and synthesis relate to the dynamic relationships between various parts of a whole, yielding expected synergies within the organization. The Lean Six Sigma Training Certificate (2024) also indicates that systems thinking draws upon several foundational concepts for understanding complexity: dynamics and emergent properties, which relate to the behaviors that arise over time through the interactions of various agents and influences within a complex system. Small changes can sometimes lead to unanticipated emergent results. Rehbock, Krafft, Sommer, Beumer, Beckers, Thate, Kaminski, & Ziemann (2023) argue that systems thinking can be employed as a participatory data collection and analysis tool to comprehend complex implementation contexts and their dynamics, supporting the selection of tailored and effective implementation actions.

## The Application of Systems Thinking in Higher Education

Systems thinking draws on and contributes to systems theory and the system sciences. It has been used as a way of exploring and developing effective action in complex contexts, enabling systems change. Higher education institutions are complex, multi-layered, and adaptable systems. In a sociological context, higher education is often considered a superstructural institution, differentially privileging and rewarding students based on their possession of institutionally legitimized knowledge, values, and behaviours (Hurst & Du Plooy, 2021; Alcovero, 2020; Byrd, 2019). Marhaeni, Tuti and Novri (2019); Wijayanti and Budirahayu (2019) argue that higher education systems, in their history and design, can be seen as tools for maintaining existing power structures, promoting specific ideologies, and preparing individuals for roles within the existing social order. Furthermore, Hurst and Du Plooy (2021); Alcovero (2020) assert that higher education institutions are complex and adaptive systems, and they find problems in responding rapidly to the demands of the knowledge-based society of advanced capitalism. Considering this, Amissah, Gannon, and Monat (2020) assert that there are currently several distinct flavours of systems thinking, both in practice and scholarship, most notably in systems science, systems engineering, and systems dynamics, humanities, and social sciences in higher education. Each flavour has a distinct history and numerous methods and tools for various higher education application contexts.

Given that higher education institutions are dynamically evolving complex systems that exhibit nonlinear behaviours, making them challenging to predict, how can systems thinking help to foster fundamental change in these institutions? Thelen et al. (2023) suggest that the application of systems thinking has proven beneficial when it is applied to higher education systems. However, there is a gap between the theoretical use of systems thinking and its application to solve educational challenges. In the researchers' schema, the gap between the theoretical use of systems thinking and its actual application is due to. amongst others, the insufficient or non-use of systems thinking as a framework to assess, monitor, and engage staff in strategic and operational activities from this perspective. Often staff work in silos and isolated departments without considering the impact of their actions on the broader system. In line with this assertion, Kwamie, Ha and Ghaffar (2021) note that systems thinking has been perceived as predominantly conceptual, with fewer applications of systems thinking documented. Juříková, Kocourek and Káčerková (2024) purport that there is pressure for higher education to respond to the new infrastructures of global society because capitalism has generated new global infrastructures (the control of capital empowered by information technology), and these driving forces have generated changes in knowledge, higher education, research, and learning. Furthermore, Bacchoo and Mishra (2024) argue that higher education institutions require modernisation in this modern age defined by fast technological developments, shifting work requirements, and worldwide expansion. Hurst and Du Plooy (2021) argue that higher education institutions are called on to become powerful instruments of change through developing modes of knowledge creation and dissemination that rise to the challenge of increasing complexity in a rapidly changing and unpredictable world. The researchers argue that if the Iceberg Model and Senge's five disciplines are learned and applied, change, no matter how difficult it is, could be embraced through questioning individual assumptions, shared vision, and team learning.

Schumacher (n.d. 11) proposes that a systems approach in higher education is to:

Journal of Ecohumanism
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

i). Identify a system - After all, not all things are systems. Some systems are simple and predictable, while others are complex and dynamic. Most human social systems are the latter.

ii). Explain the behaviour or properties of the whole system - This focus on the whole is the process of synthesis. Analysis investigates things while synthesis looks out of things.

iii). Explain the behaviour or properties of the question to be explained in terms of the role(s) or function(s) of the whole.

Pinheiro and Young (n.d.) present an alternative conception of universities and the higher education systems in which they operate to comprehend how such institutions and systems adapt and maintain themselves over time. Conceptually, it builds on complex systems theory, most notably critical insights from the study of complexity, considering recent efforts to modernize university systems in the context of rising competition and pressures towards vertical and horizontal differentiation. For Pinheiro and Young (n.d.), two models of the university – strategic vs. resilient – and the implications their differences have for the development of systems and universities and future research work in the area are useful. Pinheiro and Young (n.d.) argue that one-sided theoretical and instrumental approaches still dominate two core functions of higher education institutions: research and teaching. Davies (2024a) suggests that systems thinking provides a powerful framework for understanding and addressing the interconnected factors that affect teaching and learning in higher education. This thinking can help educators and administrators develop strategies to support students and the institution effectively. Miller, Kordova, Grinshpoun and Shoval (2023) purport that systems thinkers determine what affects the system by applying their ability to identify and understand the interrelationships between the system's components and their impact on each other and the entire system.

Furthermore, Davies' (2024b) framework for change, illuminate six key characteristics of systems thinking: i). recognising and understanding interconnections and system structure, ii). identifying and understanding feedback, iii). identifying leverage points, iv). understanding dynamic behaviour, v). using mental models to suggest possible solutions to a systems problem, vi). balancing short-term and long-term perspectives. For Pinheiro and Young (n.d.), complex projects require both technical and managerial leaders who understand each other's needs and requirements and can work in an integrated way. The challenge to achieve what Pinheiro and Young (n.d.), is as pointed out by Weick (1976) educational organisations, like universities, have traditionally been characterised as loosely coupled entities with little interaction between their parts or sub-units, on vertical units, i.e. the relation between the central administration or 'steering core' and faculties, as well as relations between the faculties and their subsequent sub-components; departments, research centers/groups. Simply stated, what happens in the faculty of education does not affect the faculty of engineering, and vice versa. This structural decoupling at the system level was best captured by work on academic leadership around the concept of 'organized anarchy' (Weick, 1976). Pinheiro and Young (2017) further argue that when systems thinking is applied to foster change, three concepts of slack, requisite variety and decoupling are central to understanding the university as an evolving, self-regulated, and complex system. Each concept, as suggested by Pinheiro and Young (2017), addresses a particular type of diversity, which serves to maintain the resilience of the university as a system geared to facilitate fundamental change.

**Facilitating Fundamental Change through Systems Thinking at the University**

Westover (2020) suggests that systems thinking has gained significant interest recently as a comprehensive approach to implementing organisational change and development. Through systems thinking, several core concepts and practical tools can be utilised to understand the complexity of a university and how to change fundamentally. McNab et al. (2020) suggest that higher education systems have been described as complex, where human adaptation to localised, circumstances is often necessary to achieve success; however, with a focus on monitoring external environmental forces for and against change. For Errida and Lofti (2021) organisations, such as universities, are required to make significant investments in implementing various changes to adapt to the changing context. However, managing change is a complex process and a risky endeavour. Thelen et al. (2023) observe that fundamental change through systems thinking involves moving

Journal of Ecohumanism
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

from a reactive, problem-solving approach to a proactive, system-level approach that considers the interconnectedness of all parts of the system, focusing on addressing the root causes of problems. According to Hall (1976) and Senge (2006), the root causes of problems can be unearthed when mental models are questioned to critique the underlying assumptions that make change difficult. For Errida and Lofti (2021), most organisational change initiatives fail, with an estimated failure rate of 60–70%. This high failure rate raises ongoing concern and interest regarding the factors that can reduce failure and enhance the success of organisational change.

For Davies (2024), a systems thinker is someone who can look at a complex system and consider its interconnectedness and interdependencies, not just its isolated components. Effective systems thinkers tend to have an open mind and think holistically, rather than relying on a predictable formula or a linear approach (Errida & Lofti, 2021; Amissah et.al., 2019). The researchers argue that when Hall's (1976) Iceberg Model and Senge's (2006) Five Disciplines are used as a systems framework to engender change, they can be useful for initiating change, in the following manner, as purported by Lean Six Sigma Training Certificate (2024); Reynolds, (2024) and Westover (2021) as follows:

- **Address root causes:** Instead of treating symptoms, systems thinking encourages addressing the underlying causes of problems within the system.

- **Promote a mindset shift:** It fosters a mindset of interconnectedness and collaboration, enabling individuals to work together effectively across different areas (i.e., questioning our mental models, embracing shared vision, and team learning).

- **Engender organisational change:** the use of Hall's (1976) Iceberg Model and Senge's (2006) can help organisations navigate complexity and foster innovation by understanding the interdependencies between different faculties and departments during the change process. Through systems thinking, several core concepts and practical tools can be applied to better understand the complexity of the organisation.

- **Solve problems**: By understanding the underlying structures and patterns within a problem, systems thinking can lead to more effective and sustainable solutions.

- **Policy development**: It can inform policy decisions by considering the broader context and potential consequences of different actions within the university.

Koo, Mendes-Filho and Buhalis (2019) note that the idea of addressing root causes in systems thinking is based on the belief that attempting to solve problems by focusing solely on the symptoms or individual components will not lead to sustainable improvement. Instead, it encourages organisations to look deeper into the system's structure, interdependence, feedback loops, and mental models to identify the underlying causes. Westover (2021) and Lean Six Sigma Training Certificate (2024), Davies (2024), Amissah, Gannon & Monat (2019); Morgan, Stratford, Harpur & Rowbotham (2023) suggest that fundamental change through systems thinking involves understanding complex systems as interconnected wholes rather than isolated parts and then applying this understanding to drive meaningful change. This approach emphasizes identifying and addressing the root causes of problems within a system, rather than just focusing on surface-level issues. For Westover (2020), understanding complexity during the change process is about organisational development, considering the context, focus, and purpose of the change while developing the organisation. Westover's (2020) claim corroborates Senge's (2006) disciplines of personal mastery, shared vision and team learning. Personal mastery is a lifelong process of continually improving one's ability to create the results one truly desires. It involves developing a personal vision, clarifying priorities, and seeing reality objectively, while also embracing ongoing learning and growth. It's about approaching life as creative work and living from a creative viewpoint (Senge, 2006).

Journal of Ecohumanism
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

Sinusoid (2022) posits that a shared vision forms when people orient their personal objectives towards an overarching goal, i.e., fundamental change. Team learning is a process of aligning and developing the capacity of a team to create the results its members truly desire (Senge, 2006). These learning disciplines form a system of fundamental change that includes personal mastery and systems thinking. However, Glendell, Hare, Waylen, Adams, Boucher, Gagkas, Gimona, Martino, Matthews and Polhill (2025) suggest that applying systems thinking is often challenging, and we need to reflect on the pros and cons of different approaches for building systems understanding and informing envisaged changes. The researchers also believe that despite efforts to change, change does not happen suddenly or overnight. Change is a difficult, arduous, complex, messy and uneven process. Thus, applying systems thinking to foster change enables us to:

- Change our thinking to match the interconnected, dynamic complexity of our university and its environment.
- Communicate with others to create new ways of thinking and seeing and develop shared understanding.
- Change our behaviour to work with the complex forces in the system (instead of against them) to realise our vision.
- Identify and test a wider variety of possible actions and solution pathways.
- Become more aware of the potential for unintended consequences of our actions (Davies, 2024; Errida & Lofti, 2021; Amissah, Gannon & Monat, 2019; Kezar & Holcombe, 2019).

Errida and Lofti (2021) argue that many organisations struggle with organisational change projects and fail to achieve the expected outcomes due to traditional bureaucratic academic structures that inhibit decentralised decision processes and data-based strategy development, and cross-university cooperation. Davies (2024a); Bacchoo and Mishra (2024); Kezar and Holcombe (2019) assert that with systems thinking, problems are solved by investigating factors and outcomes of those factors, promoting innovation-based systemic transformations at the university, faculty and departmental levels. Davies (2024a) suggests that successful change necessitates a strategic approach that balances innovation with stakeholder engagement to ensure that transformations are meaningful, sustainable, and aligned with the university's mission. Successful change management involves modifying structures, practices, or cultures to enhance effectiveness, adapt to new challenges, or align with evolving institutional goals (Koo, Mendes-Filho and Buhalis, 2019). This process could include revising curricula, updating teaching methods, improving research strategies, streamlining administrative processes, or promoting a more inclusive departmental environment (Bosch, 2020).

Davies (2024a) observes that a systems thinker might approach a problem by asking:

- What could be under the surface that we don't see?
- What are the conditions (budgets, resources) that influence the problem?
- What issues, people or systems are working together to create what is seen above the water?
- What ripple effects might be created by our ideas/solutions?

For Amissah, Gannon and Monat (2019), a structured and collaborative process is crucial for effectively changing an academic faculty or department. Firstly, identify the need for change through data-driven assessments, such as faculty and student feedback, performance metrics, or comparisons with peer institutions (Bosch, 2020). Next, establish a clear vision with measurable objectives for curriculum modernisation, research expansion, or enhanced student support (Westover, 2020). Engaging stakeholders—faculty, staff, students, and administrators—is essential for building consensus and

Journal of Ecohumanism
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

addressing resistance (Thelen et al., 2023). Develop a phased implementation plan that prioritises achievable milestones, such as piloting new courses before full-scale curriculum changes or gradually introducing digital tools to enhance teaching (Westover, 2021). Allocate resources, including training and funding, to support the transition (Errida & Lofti, 2021). Continuously monitor and evaluate progress through surveys or performance indicators to adjust based on feedback (Sinusoid, 2022). Finally, institutionalise change through updated policies and celebrate successes to ensure long-term adoption (Koo et al., 2019). By combining strategic planning with inclusive leadership, academic departments can help navigate change effectively, fostering resilience and growth in a dynamic educational landscape (McNab et al., 2020). Bosch (2020) suggests that during the change process; synthesis enables understanding a problem by the aspects that come together to produce the system's outcome. Such an approach examines system components and interactions without losing sight of the whole, placing particular focus on emergent behaviours and outcomes (Bosch, 2020).

## Resistance to Change

Deacon and Laufer (2024) argue that resistance to change is inevitable in any organisation because different people hold different assumptions and dispositions about work processes, expected behaviours, and attitudes. Anderson (2023) argues that the way universities operate shows a powerful resistance to, reluctance to, and opposition to change, embedded in the culture and structures. This resistance is exacerbated by university hierarchical structures, where decision-making processes can be slow and bureaucratic, hindering necessary reforms (Damawan & Aziza, 2023). Bosch (2020) suggests that implementing meaningful change within an academic department often faces systemic, cultural, and logistical challenges. One primary obstacle is resistance to change, as faculty and staff may resist new initiatives due to comfort, scepticism, or concerns about increased workloads (Bosch, 2020). The other factors contributing to resistance include conflicting priorities among stakeholders, such as differing views between administrators focused on efficiency and faculty emphasising academic freedom, which can create friction and impede progress (Furxhi, 2021). Resource constraints, including limited funding, outdated infrastructure, and inadequate training, also hinder the implementation of innovative programs or technologies (Petersen & Whittaker, 2022). Furthermore, unclear communication about the rationale and benefits of change can lead to misunderstandings and low buy-in from key participants **(**Bosch, 2020). Sustainability is another challenge, as temporary enthusiasm may diminish without ongoing support, evaluation, and institutional reinforcement (Amissah et al., 2019). Addressing these barriers requires proactive leadership, transparent communication, and a commitment to fostering a culture that values adaptability and shared goals (Kezar & Holcombe, 2019). Thus, the success of change processes depends critically on all stakeholders — leaders, faculty, students, and administration — supporting the transition (Westover, 2020). Without their approval and backing, it is unlikely that change will be implemented sustainably and successfully. The need for a shift in mindset enables a push for meaningful change in the field and ensures its sustainability and relevance.

## Leadership for Fundamental Change

Waghid (2023) argues that change management requires change leadership, an ethical form of leadership, to support change management initiatives. For Kwamie, Ha and Ghaffar (2021), significant changes can be facilitated through systems thinking in organisational activities, adaptive forms of leadership, and orienting towards more systemic impacts. Organisational leaders with a systems-thinking mindset will see this as an opportunity for enhanced collaboration and innovation, with a core focus on relationships between parts of a system rather than the parts in isolation (Miller et al., 2023). These relationships generate interconnections and interdependencies, which are essential for understanding dynamic complexity to foster meaningful change. Westover (2020) offers that these interconnections and interdependencies depict causality, which refers to the flows of influence between the interconnected parts within a system. The interconnections and interdependencies can be harnessed through strategic and resilient leadership and effective strategies to promote cross-departmental collaboration. The concrete impacts on policy design, policy narratives, and implementation that can be generated when the leadership actively engages with systems thinking (Vlachopoulos, 2021). However, such efforts are successful and sustained due to significant resource intensity in terms of people, money, and time.

Journal of Ecohumanism
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

Recent research has introduced additional dimensions, such as psychological empowerment and employee creativity, suggesting a multidimensional approach to understanding change leadership's impact on innovative work behaviours (Stanescu, Zbuchea, and Pinzaru 2021; Żywiołek, Tucmeanu, Tucmeanu, Isac, and Yousaf 2022). The multidimensional approach to change will enable an improved perspective on the fundamental parts of the system, including relationships and feedback loops. A skilled systems-thinking leader will ensure that mechanisms for multiple feedback loops are established and effectively communicated to their employees to support the change efforts. Vlachopoulos (2021) argues that, in many instances, employees are affected by poor change leadership in the university. Considering this, Waghid (2023) argues that poor change leadership could be attributed to a lack of urgency, resulting in a state of complacency in higher education. Moreover, Goodman (2018) suggests that there are external elements that don't change, change very slowly, or whose changes are irrelevant to the problem at hand within the university. The researchers believe that a strategic and resilient leader is critical for communicating the change process.

The table below sums up the key differences between a strategic actor and a resilient actor model of the university.

**Figure 1: Models of university: Strategic actor vs. Resilient actor**

| Item | **Strategic actor** | **Resilient actor** |
|---|---|---|
| Strategic interface (internal & external dynamics) | Reduce/manage complexity (plan, steer, improve) | Cherish complexity (emergence, self-organization, co-evolution) |
| Core value | Efficiency | Adaptability/Robustness |
| Use of resources | Maximize resources | Allow slack |
| Approach to internal diversity | Rationalize (streamline and standardize) | Support requisite variety |
| Locus of control and unit interdependencies | Tight coupling (hierarchy) | Loose coupling (networks) |
| Preferred modus operandi | Exploitation (specialization) | Exploration (diversification) |
| Positional objective | Winning (being the best overall) | Thriving (adaption to niche and excelling there) |

**Source:** Pinheiro, R. & Young, M**.** (2017).

Table 1 depicts a distinction between a strategic actor (leader) and a resilient actor. The researchers believe that the combination of these skills is necessary to advance the vision for change. Able leaders apply a combination of the two distinct dispositions of leadership depicted in Table 1. Such leaders can demonstrate. dynamic abilities to assess, function creatively, draw on data from the environment to support decision making, drive process improvements, and develop strategies to build momentum towards progress through reflection, trust-building, and broad interactions/engagements across the system to sustain change. Petersen and Whittaker (2022) observe that agile leaders lead innovation in a dynamic environment to meet the needs of students, staff, and other stakeholders within the system. Context-based leadership models that respond with agility and with dynamism have great relevance and aptitude for driving sustainability-centered initiatives (Petersen & Whittaker, 2022). For Koo et al. (2019) and Hoon, Idris and Alwi (2020), leadership for change will adopt a holistic approach that involves understanding and analysing the organisation as a complex system of interconnected elements, rather than focusing solely on individual parts, to facilitate change.

To facilitate meaningful change, it is essential to create feedback loops in the organisation. Feedback loops refer to situations where an initial change leads to impacts upon the system that eventually come back to cause additional change to the original element (McNab et al., 2020). There are two types – reinforcing feedback that amplifies change and balancing feedback that counteracts change. The effects of feedback loops typically happen over varied time delays (Voulvoulis et al., 2022). Overcoming resistance to change through feedback loops between various parts of the organisation, identifying patterns, behaviours and attitudes is essential for fostering a culture of continuous improvement, innovation, and learning from past

Journal of Ecohumanism
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

experiences to engender fundamental change. Such a process helps the organisation to make informed decisions, adapt to changing environments, and continuously evolve to meet the needs and expectations of stakeholders (Westover, 2020). Balancing and reinforcing feedback loops within an organisation serve as guidance for adjusting the interconnectedness of the system's elements and the outcomes of the change process.

## Challenges and Pitfalls of Adopting Systems Thinking in Higher Education

The integration of systems thinking into higher education institutions offers transformative potential, yet it is not without considerable challenges and pitfalls. As an approach that encourages holistic understanding and interconnectedness, systems thinking can often meet resistance within the traditionally compartmentalized structures of education. This section identifies common barriers to adopting systems thinking, highlights its limitations, and suggests pathways to mitigate these challenges, particularly in the South African context.

### Common barriers to adoption

i). Cultural Resistance: Higher education institutions often possess entrenched cultures that prioritize specialized knowledge over interdisciplinary collaboration. Faculty and administration may be hesitant to adopt a systems thinking approach due to the perceived threat to their own disciplinary expertise. This cultural inertia can stifle innovation and prevent collaborative efforts that are essential for a systems-level analysis (Voulvoulis et al., 2022).

ii). Lack of Awareness and Training: Many stakeholders in higher education may not be sufficiently aware of what systems thinking entails or how to apply it. This gap in understanding creates barriers to implementation, as stakeholders may feel ill-equipped to engage in a systems-oriented dialogue (Aparicio, Rodríguez, & Zabala-Iturriagagoitia, 2021).

iii). Resource Constraints: Developing systems thinking capability requires significant investment in terms of time, financial resources, and training. In the context of South African higher education, where funding is often limited, institutions struggle to dedicate the resources to train educators, administrators, and students in systems thinking methods (Christou et al., 2024).

iv). Complexity and Ambiguity: Systems thinking often involves dealing with messiness and unpredictability, which can be uncomfortable for those accustomed to linear, reductionist models. This complexity may deter stakeholders from fully embracing systems approaches, leading them to favor more familiar methods that provide clearer, more immediate results (Midgley & Rajagopalan, 2021).

## Limitations of the Systems Thinking Approach

While systems thinking provides valuable frameworks for understanding complex issues, it is crucial to recognize its limitations. George Box's famous adage, "All models are wrong, some are useful," aptly encapsulates the essence of this concern. Models serve as abstractions designed to illuminate aspects of reality; however, they are inherently limited by the perspectives and assumptions from which they are derived (Böhm et al., 2022).

i). Over-simplicity: The Iceberg Model, often utilized in systems thinking, serves as an entry point to explore underlying structures and patterns. However, its strength in simplifying complex scenarios can also become a pitfall. By reducing multifaceted issues to mere visible and invisible components, the model may obscure deeper systemic dynamics that require comprehensive analysis. Thus, it is advisable to use the Iceberg Model not as an endpoint but rather as a catalyst for deeper exploration and discussion (Mahringer et al., 2025).

ii). Subjectivity in Interpretation: What lies beneath the surface of an iceberg can vary significantly based on individual perspective and experience. Stakeholders with lived experiences—particularly those from

Journal of Ecohumanism
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

marginalized backgrounds—can offer insights that challenge dominant narratives and assumptions. Failing to include diverse voices in the analysis limits the understanding of underlying systemic issues and risks perpetuating existing biases (Clark et al., 2022).

## Recommendations

Based on the findings of this study and the identified challenges associated with implementing systems thinking in higher education, the following recommendations are proposed to facilitate the effective adoption of systems thinking at institutions of higher education in South Africa. These recommendations incorporate the proposed solutions aimed at overcoming the barriers to systems thinking implementation:

### i) Foster Interdisciplinary Collaboration

To combat the siloed nature of traditional academic structures, institutions should actively promote interdisciplinary collaboration. This can be achieved by establishing formal cross-departmental committees and initiatives focused on systems thinking. Such committees can facilitate collaborative projects that draw on diverse expertise and perspectives, enhancing the holistic understanding of complex issues. Universities should encourage team-based approaches to problem-solving that leverage insights from multiple disciplines, laying the groundwork for a vibrant culture that values integrated thinking (Aparicio et al., 2021). Interdisciplinary seminars, joint research initiatives, and multi-faceted community engagement projects can serve as platforms for this collaboration.

### ii) Implement Targeted Training Programmes

Training is paramount for equipping faculty, staff, and students with the skills necessary to engage in systems thinking effectively. Institutions should prioritize targeted training programs that include workshops, seminars, and formal courses on systems thinking. These programs should not only cover theoretical aspects but also emphasize practical application, enabling participants to develop confidence and competence in utilizing systems thinking tools and methodologies (Christou et al., 2024). Furthermore, institutions should consider fostering partnerships with organizations that specialize in systems thinking to enhance the training experience and provide external expertise.

### iii) Engage Stakeholders with Lived Experience

Active engagement of individuals who have firsthand experience with the challenges being addressed is essential for enriching systems thinking analysis. Institutions should create avenues for these stakeholders—such as students, community members, and professionals—to contribute their insights and perspectives. This could involve participatory workshops, focus groups, or consultation processes that allow for the incorporation of diverse voices into the analysis of systemic issues (Voulvoulis et al., 2022). By valuing the wisdom of those directly affected by systemic challenges, institutions can ensure that their solutions reflect the realities on the ground, leading to more effective and equitable outcomes.

### iv) Adopt Iterative Processes

Ultimately, the goal of systems thinking is not to create a definitive solution but to foster a continuous learning and adaptation process. Institutions should embrace an iterative approach to systems thinking, wherein models and frameworks are subject to ongoing refinement based on stakeholder feedback and real-world applications (Midgley & Rajagopalan, 2021). This can be operationalized through regular review cycles, allowing for adjustments and enhancements as new information and insights emerge. Institutions should promote a culture of experimentation, where pilot projects can be tested and evaluated, providing valuable lessons for broader implementation.

Journal of Ecohumanism
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

## Conclusion

The integration of systems thinking within South African higher education presents a profound opportunity to foster fundamental change in academic institutions. This theoretical exploration highlights the need for a comprehensive and systemic approach that involves intricate collaboration, targeted training, staff engagement, and adaptability. These components are crucial for creating an environment that supports and actively nurtures systems thinking. Adopting systems thinking allows institutions to view challenges and opportunities holistically, as interconnected rather than isolated incidents. This holistic perspective encourages a deeper understanding of how various elements within the educational ecosystem interact and influence one another. Core principles such as interconnectedness, feedback loops, and dynamic complexity become instrumental in guiding institutions toward more sustainable and equitable outcomes. Moreover, systems thinking serves as a versatile tool for critically examining existing institutional bureaucratic structures, policies, and practices. By employing systems thinking methodologies, institutions can identify leverage points for effective policy interventions, optimise resource allocation, and enhance the overall impact of their initiatives. Additionally, the active participation of stakeholders, especially those with lived experiences, ensures that the collective vision for institutional change is grounded and addresses the needs of the broader university community. Thus, embracing systems thinking enhances institutional effectiveness and aligns strategic objectives, change efforts, sustainability, and equity. As higher education institutions embark on this transformative journey, they pave the way for a more integrated and responsive educational framework that equips staff and students to tackle the complex challenges of the future. The call to action is clear: institutions must harness the full potential of systems thinking to catalyse meaningful change and contribute to a more just and sustainable society

## References

Abalo, T., & Jeff Williams, M. B. A. (2025). Tax "Cliff" in 2025 Could Mean Major Change for Philanthropy and Nonprofits. 11 TRENDS IN PHILANTHROPY FOR 2025, 16.

Ahmad, Z. & Siddiqui, M.H. 2019. Achieving Excellence in Higher Education. Review of Education, 7(1):63-80.

Anderson, J. (2023). Higher Education's resistance to change. Harvard: Graduate School of Education. Available at: https://www.gse.harvard.edu/ideas/edcast/23/11/higher-educations-resistance-change. Accessed: 30 May 2025.

Amissah, M., Gannon, T., & Monat, J. (2020). What is Systems Thinking? Expert Perspectives from the WPI Systems Thinking Colloquium of 2 October 2019.Systems, 8(1), 6; https://doi.org/10.3390/systems8010006.

Arnold, R.D. & Wade, J.P. (2015). A Definition of Systems Thinking: A Systems Approach. Procedia Computer Science, 44,669-678.

Bacchoo, A. & Mishra, P.K. (2024). The academic change model innovating Higher Education. International Journal of Advanced Research in Education and Technology, 11(02), 735-745.

Böhm, S., Carrington, M., Cornelius, N., de Bruin, B., Greenwood, M., Hassan, L., & Shaw, D. (2022). Ethics at the centre of global and local challenges: Thoughts on the future of business ethics. Journal of Business Ethics, 180(3), 835-861.

Brankovic, J. & Cantwell, B. (2022). Making sense of change in higher education research: exploring the intersection of science and policy. High Educ, 84,1207–1226.

Bosch, R. (2020). Ways of thinking: Encouraging a shift in mindset. Available at: https://africa.iclei.org/wp-content/uploads/2020/08/2020_Publication_Ways-of-thinking-Encouraging-a-shift-in-mindset.pdf. Accessed: 7 May 2025.

Byrd, D. (2019). Uncovering Hegemony in Higher Education: A Critical Appraisal of the Use of "Institutional Habitus" in Empirical Scholarship. Review of Educational Research, Vol. 89, No. 2 (April 2019): 171-210.

Castellani B, Gerrits L (2021). 2021 map of the complexity sciences. Art & Science Factory. Available at: https://sacswebsite.blogspot.com/2021/09/q-for-2021-version-of-map-of-complexity.html. Accessed: 15 May 2025.

Christou, O., Manou, D. B., Armenia, S., Franco, E., Blouchoutzi, A., & Papathanasiou, J. (2024). Fostering a whole-institution approach to sustainability through systems thinking: an analysis of the state-of-the-art in sustainability integration in higher education institutions. Sustainability, 16(6), 2508.

Journal of Ecohumanism
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

Clark, S., MacLachlan, M., Marshall, K., Morahan, N., Carroll, C., Hand, K., & O'Sullivan, K. (2022). Including digital connection in the United Nations sustainable development goals: A systems thinking approach for achieving the SDGs. Sustainability, 14(3), 1883.

Davies, L. (2024a). Understanding systems thinking concepts and workplace applications. Available at: https://www.phoenix.edu/blog/what-is-systems-thinking.html. Accessed: 15 April 2025.

Davies, L. (2024b). What is systems thinking? Available at: https://www.phoenix.edu/articles/business/what-is-systems-thinking.html. Accessed: 28 May 2025.

Deacon, B. & Laufer, M. (2024). Resistance to change: Challenges and opportunities in digital higher education. Available at: https://www.hiig.de/en/resistance-to-change/. Accessed: 30 May 2025.

Deng, C., Gulseren, D., Isola, C., Grocutt, K., & Turner, N. (2023). Transformational leadership effectiveness: An evidence-based primer. Human Resource Development International, 26(5), 627-641.

Dlamini, K. 2024. South Africa desperately needs a culture of excellence. Available at: https://www.up.ac.za/news/post_3233895-south-africa-desperately-needs-a-culture-of-excellence. Accessed: 15 May 2025.

Du Plooy., B. & von Moellendorff, M. (2024). "Our theatre is society": Perceptions and practices of university-based African Centres of Excellence regarding community engagement and the third mission of higher education. South African Journal of Higher Education, 38(2), 99-119.

Errida A, Lotfi B. 2020. Measuring change readiness for implementing a project management methodology: an action research study. Acad Strat Manag J, 2(19),1–17.

Furxhi, G. (2021). Employee's Resistance and Organizational Change Factors. European Journal of Business Management and Research, 6(2):30-32.

Glendell, M., Hare, M., Waylen, K.A., Adams, K., Boucher, J.L., Gagkas, Z., Gimona, A., Martino, S., Matthews, K.B. & Gareth Polhill, J.G. (2025). Systems thinking and modelling to support transformative change: key lessons from inter-disciplinary analysis of socio-ecological systems in applied land systems research. Discov Sustain, 6, 231.https://doi.org/10.1007/s43621-025-00987-3.

Goodman, M. (2018). Systems thinking: what, why, when, where, and how? Available at: https://thesystemsthinker.com/systems-thinking-what-why-when-where-and-how/. Accessed: 15 April 2025.

Hall, E.T. 1976. Beyond culture. Germany, Hamburg: Anchor Books.

Hoon, C. W., Idris, F. & Alwi, S. (2020). Systems thinking practice in non-profit organizations: A qualitative examination. Journal of Nonprofit & Public Sector Marketing, 32(2), 222-242.

Juříková, M.; Kocourek, J. & Káčerková, E. (2024). Changes in Preferences and Attitudes Towards University Selection in the Post-COVID Era. TEM Journal, 132(15), 1007-1017.

Kezar, A.; Hallet, R.E., Corwin, Z.B. & Hypolite, L. (2025). Moving toward institutional culture change in Higher Education: An exploration into cross-functional professional learning communities. Open Access, 50, 687-714.

Koo, C.; Mendes-Filho, L.; & Buhalis, D. (2019). Smart tourism and competitive advantage for stakeholders. Tourism Review, 74(1),1-5.

Kubo, N. & Lyles, M. A. (2021). Leveraging the organizational systems lens: A review and future research directions. Journal of Management, 47(1),185-218.

Kwamie, A., Ha, S., & Ghaffar, A. (2021). Applied systems thinking: unlocking theory, evidence and practice for health policy and systems research. Health Policy and Planning, 36(10),1715–1717.

Lean Six Sigma Training Certification. (2024). Applications of Systems Thinking – Systems Thinking Framework. Available at: https://www.6sigma.us/systems-thinking/systems-thinking-framework/. Accessed: 7 May 2025.

Mahringer, C. A.; Schmiedle, L.; Albicker, L.; & Mayer, S. (2025). The Iceberg Model of Change: A taxonomy differentiating approaches to change. 11, (2), e41952.

Marhaeni, W.B. Tuti, B. & Novri, S. 2019. Free education as superstructure: Phenomenological study of free private education. Masyarakat Kebudayaan dan Politik, 32, (3),217-226.

Mahringer, C. A., Schmiedle, L., Albicker, L., & Mayer, S. (2025). The Iceberg Model of Change: A taxonomy differentiating approaches to change. Heliyon, 11(2).

McNab, D., McKay, J., Shorrock, S., Luty, S., & Bowie, P. (2020). Development and application of 'systems thinking' principles for quality improvement. BMJ Open Qual
9(1): e000714. doi: 10.1136/bmjoq-2019-000714.

Midgley, G., & Rajagopalan, R. (2021). Critical systems thinking, systemic intervention, and beyond. In C. H. K. Tan, & M. J. J. E. van der Meer (Eds.), Handbook of systems sciences (pp. 1-51). Springer.

Miller, A. N.; Kordova, S.; Grinshpoun, T.; & Shoval, S. (2023). To be or not to be a systems thinker: Do professional Characteristics influence how students acquire systems-thinking skills? Front. Educ., 8. Available at: https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2023.1026488/full. Accessed: 28 May 2025

Morgan, M.J., Stratford, E., Harpur, S., & Rowbotham, S. (2023). A systems thinking approach for community health and wellbeing. Systematic Practice and Action Research, 37,161–183.

Palmunen, L.M. Lainema T. & Pelto, E. (2021). Towards a manager's mental model: Conceptual change through business simulation. The International Journal of Management Education, 19(2). Available at: https://www.sciencedirect.com/science/article/pii/S1472811721000094. Accessed: 22 May 2025.

Journal of Ecohumanism
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

Petersen, S.A. & Barlett, S.M. (2020). When Culture and Change Collide In Higher Education: A Case Study at One University. Administrative Issues Journal, 10(2), 45-59.

Pinheiro, R. & Young, M. (2017) The university as an adaptive resilient organization: A complex systems perspective. Available at: https://www.ippapublicpolicy.org/file/paper/592e7eb201c59.pdf. Accessed: 8 May 2025.

New Philanthropy Capital. (2025). The Iceberg Model. Available at: https://www.thinknpc.org/resource-hub/systems-practice-toolkit/the-iceberg-model/#:~:text=(The%20original%20Iceberg%20Model%20was,by%20systems%20and%20management%20theo. Accessed: 15 May 2025.

Rahman, A., Dzunur'aini, R. & Nur'aini, I. (2022). Knowledge management as an effort to develop learning organizations in Islamic educational institutions. Nidhomul Haq: Jurnal Manajemen Pendidikan Islam, 7(1),92-102.

Rehbock, C., Krafft, T., Sommer, A., Beumer, C., Beckers, S.K., Kaminski, S.K., & Ziemann, A. (2023). Systems thinking methods: a worked example of supporting emergency medical services decision-makers to prioritize and contextually analyse potential interventions and their implementation. Health Res Policy Sys 21, 42 (2023). https://doi.org/10.1186/s12961-023-00982-y.

Reynolds, M. (2024). Systems Thinking Principles for Making Change. Systems, 12, 437. https://doi.org/10.3390/systems12100437.

Schumacher, E.F. (n.d.). Introduction to systems thinking principles and analytical tools. Available at: https://www.unescap.org/sites/default/files/Introduction%20to%20systems%20thinking%20tools_Eng.pdf. Accessed: 2 May 2025.

Senge, P. M. 2006. The Fifth Discipline. The Art and Practice of the Learning Organization. London: Random House.

Shin, S. & Zhou, J. (2020). Intellectual stimulation isn't always inspiring: The moderating role of employee openness to experience. Journal of Applied Psychology, 105(7), 746–760.

Siangchokyoo, N., Klinger, R. L., & Campion, E. D. (2020). Follower transformation as the linchpin of transformational leadership theory: A systematic review and future research agenda. The Leadership Quarterly, 31(1), 101341.

Sinusoid, D. (2022). Peter Senge: A Shared Vision (Discipline 3). Available at: https://www.shortform.com/blog/shared-vision-peter-senge/. Accessed: 30 May 2025.

Sikhakhane, J. (2021). Africa needs to speed up research excellence: here's how. Available at: https://theconversation.com/africa-needs-to-speed-up-research-excellence-heres-how-169552. Accessed: 15 May 2025.

Sinusoid, D. (2022). The Fifth Discipline: Systems Thinking Explained. Available at: https://www.shortform.com/blog/the-fifth-discipline-systems-thinking/. Accessed: 20 May 2025.

Somasundaram, J & Rasul, M. (2019). Modelling universities as complex systems: The difficulty of transforming attrition intelligence into unified action. Conference: 19th annual SEAAIR conference: Transforming intelligence into action in IR, At: Taipei, Taiwan.

Stanescu, S. D.; Zbuchea, A. & Pinzaru, F. (2021). Transformational leadership and innovative work behaviour: the mediating role of psychological empowerment. Available at: https://www.researchgate.net/publication/345676023_Transformational_leadership_and_innovative_work_behaviour_the_mediating_role_of_psychological_empowerment. Accessed: 28 May 2025.

The Core Collaborative. (2024). Beyond the Surface: Exploring the Iceberg of Culture. Available at: https://thecorecollaborative.com/beyond-the-surface-exploring-the-iceberg-of-culture/. Accessed: 22 May 2025.

Thelen, J., Fruchtman, C, F., Bilal, M., Gabaake, K., Shahid Iqbal, Keakabetse, T.; Aku Kwamie, Mokalake, E., Mupara, L., Seitio-Kgokgwe, O., Zafar, S., Cobos Muñoz, D,C.. (2023). Development of the Systems Thinking for Health Actions framework: a literature review and a case study. BMJ Glob Health, 17;8(3): e010191. doi: 10.1136/bmjgh-2022-010191.

Vlachopoulos, D. (2021). Organizational Change Management in Higher Education through the Lens of Executive Coaches. Education Sciences, 11(5), 5-15.

Voulvoulis, N., Giakoumis, T., Hunt, C., Kioupi, V., Petrou, N., Souliotis, I., & Vaghela, C. J. G. E. C. (2022). Systems thinking as a paradigm shift for sustainability transformation. Global Environmental Change, 75, 102544

Waghid, F. (2023). Crises, changed leadership, change management and educational technology. South African Journal of Education, 37(4), 1-19.

Weick, K.E. (1976). Educational Organizations as Loosely Coupled Systems. In: Administrative Science Quarterly, 21, pp.1–19.

Westover, J. H. (2020). The role of systems thinking In organisational change and development. Leadership. Available at: https://www.forbes.com/councils/forbescoachescouncil/2020/06/15/the-role-of-systems-thinking-in-organizational-change-and-development/. Accessed: 15 April 2025.

Westover, J.H. (2021). The role of systems thinking in organizational change and development. Available at: https://www.linkedin.com/pulse/role-systems-thinking-organizational-change-jonathan-h-/. Accessed: 7 May 2025.

**Journal of Ecohumanism**
2025
Volume: 4, No: 4, pp. 1006 – 1023
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v4i4.6828

Whittaker, J.A. & Montgomery, B. L. (2022). Advancing a cultural change agenda in higher education: issues and values related to re-imagining academic leadership. Discover Sustainability, 3(10),1-9.

Żywiołek, J.; Tucmeanu, E.R.; Tucmeanu, A.L.; Isac, N. & Yousaf, Z. (2022). Nexus of Transformational Leadership, Employee Adaptiveness, Knowledge Sharing, and Employee Creativity.Sustainability, 14(18), 11607. 10.3390/su141811607.