



SYSTEMS THINKING AND ORGANIZATIONAL PERFORMANCE OF PENSION FUND ADMINISTRATORS IN NIGERIA: MODERATING ROLE OF EMPLOYEE INVOLVEMENT CULTURE

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Abstract

Despite increasing emphasis on systems thinking as a strategic capability, limited empirical evidence exists on how employee involvement culture shapes its influence on organizational performance, particularly among Pension Fund Administrators in Nigeria. This study examined the moderating effect of employee involvement culture on the relationship between systems thinking including continuous learning, dynamic thinking, mental models, pattern recognition, process orientation and systems logic, and organizational performance of Pension Fund Administrators in Nigeria. The study employed cross-sectional survey design where a simple random sampling method was adopted to select two hundred and eighty two (282) employee of selected licensed PFAs in Nigeria, from whom data were collected through structured questionnaire. Data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) with Smart PLS 4.0. The findings reveal that continuous learning and dynamic thinking significantly and positively influence organizational performance. In contrast, mental models, process orientation, pattern recognition, and systems logic show no significant direct relationships with organizational performance, suggesting that these dimensions may not have significant direct effect within the study context. The moderation analysis shows that employee involvement culture positively moderates the relationship between systems logic and organizational performance but negatively moderates the relationship between process orientation and organizational performance. Overall, the findings indicate that learning and adaptive thinking capabilities are important predictors of organizational performance. The study recommended, among others, that Pension Fund Administrators should enhance continuous learning practices and foster employee involvement culture as strategic approaches for improving organizational performance.

Keywords: Systems thinking, employee involvement culture, organizational performance, Pension Fund Administrators; Nigeria

1.0 Introduction

In the contemporary business environment characterised by rapid technological change, increasing completion, and regulatory pressure, organizations are required to adopt holist management approaches to remain

competitive. One such approach is systems thinking, which views organizations as interrelated and interdependent components rather than isolated units (Senge, 2006). Organizational performance is one of the critical areas of concern for both scholars



and practitioners, given that it reflects the effective and efficient utilization of resources toward achieving organizational objectives (Richard, Devinney, Yip, & Johnson, 2009). Consequently, inefficient utilization of organizational resources may lead to poor performance (Dahiru, 2025). Thus, within the Nigerian pension sub-sector, organizational performance is critical because it influences contributors' confidence, financial security and retirees' welfare.

The contribution of pension assets to economic development, measured as a proportion of Gross Domestic Product (GDP), continues to show mixed results among Organization for Economic Co-operation and Development (OECD) countries (OECD, 2025). For instance, pension asset as a proportion of GDP remain relatively low in several African countries, with Nigeria's pension assets-to-GDP ratio of 7.8% lower than those of Namibia (103.6%), South Africa (83.2%), Botswana (50.0%), and Lesotho (38.8%) due to poor performance of PFAs (OECD, 2025). In Nigeria, despite generating N28 trillion through pension contribution, 27,701 pension contributors transferred their accounts for one PFA to another (Tolu-Kusimo, 2025), while 368,911 Retirement Savings Account holders have transferred N1.77 trillion from one PFA to another which may indicate challenges in pension system effectiveness and institutional performance (National Pension Commission, 2025).

Concerns regarding PFAs performance have contributed to calls by stakeholders such as the Head of the Civil Service of the Federation and Permanent Secretaries to request for presidential fiat to exit the scheme (Umar, 2023). Also, the personnel of the Nigerian Intelligence Agency (NIA)

and National Assembly (NASS) service have been excluded from Contributory Pension Fund (CPF) due to poor performance of the PFAs (Olafusi, 2023). Furthermore, pension contributors and retirees have agitated against poor performance of PFAs in Nigeria (Iwunze, 2023). Nevertheless, Achadinha (2020) argued that pension reforms, strategic management approaches such as systems thinking, organizational culture, and technological advancement may enhance performance of PFAs.

Systems thinking enables organizations to enhance performance (Alatailat, Elrehail & Emeagwali, 2019). Thus, organizations that adopt systems thinking understand the complexity of the organization and align organizational activities with overall goal (Senge, 2006). In the context of PFAs in Nigeria, systems thinking may enhance efficient service delivery and organizational performance. Nonetheless, implementation of systems thinking within organizations require organizational culture, which shapes employees behavior, attitude and engagement with the organization (Denison, 1990). Among the dimensions of organizational culture, employee involvement culture emphasizes participation, empowerment, team work and open communication to enable employees contribute actively in decision-making process, understand systemic relationship and support implementation of complex management approach which may enhance organizational performance (Denison & Mishra, 1995).

Employee involvement culture refers to the extent to which organizations create opportunities for employees to participate in decision making process, problem solving and continuous improvement in the organization (Lawler, 1996). According to



Ologbo and Sofian (2013) employee involvement culture influences organizational performance. Theoretically, employee involvement culture aligns with systems theory which views organizations as complex, adaptive, and open systems composed of interdependent subsystems that interact continuously with one another and with the external environment (Bertalanffy, 1968).

Despite the significance of systems thinking and employee involvement culture in organizations, empirical evidence on how employee involvement culture shapes the relationship between systems thinking and organizational performance remains limited, particularly in the Nigerian pension sector. Most existing studies focus on direct relationship between the constructs without considering the moderating role of employee involvement culture. Consequently, there is a need to investigate how employee involvement culture may moderate the relationship between systems thinking dimensions, namely; continuous learning, dynamic thinking, understanding mental models, pattern recognition, process orientation and systems logic, and organizational performance.

In the light of the foregoing, this study proposes a moderating framework that examines the moderating effect of employee involvement culture on the relationship between systems thinking and organizational performance among PFAs in Nigeria. The study seeks to contribute to the existing body of knowledge on management practices and performance within the pension subsector. Furthermore, the findings are expected to provide practical insight for managers and policy makers seeking to enhance standard of living of pension contributors and retirees through effective

and efficient performance of PFAs in Nigeria.

1.2 Statement of Problem

Existing empirical studies examining the relationship between systems thinking dimensions (continuous learning, dynamic thinking, understanding mental models, pattern recognition, process orientation and systems logic) and organizational performance have revealed inconsistent results. Some studies have reported positive relationship between systems thinking dimensions and organizational performance (Ojo, Salau, & Akinlabi, 2025; Araújo, Gonçalves, Branco, & Braga, 2017; Dias & De Toni, 2018; Akhtar, Awan, Naveed, & Ismail, 2018). Conversely, other studies reported weak, insignificant or negative relationship between systems thinking and organizational performance (Biswakarma, & Bohora, 2025; Zelenyte, 2025; Keskin & Palaz, 2024; Mbuthia, 2018; Zhao, Gao, Hao, & Ren, 2023; Akhtar, Awan, Naveed & Ismail, 2018; Gavetti & Levinthal, 2000; and Tang, Pee & Iijima, 2013). To explain these inconsistent findings, scholars have suggested examining moderating variables that may influence the strength or direction of relationships between organizational constructs (Baron & Kenny, 1986; Lowry & Gaskin, 2014). Given that employee involvement culture influences employee participation, knowledge sharing and organizational adaptability, it may serve as a contextual factor that shapes how systems thinking translates into performance outcomes. Therefore, this study introduced employee involvement culture as a moderator.

Existing studies on systems thinking and organizational performance have employed various qualitative and quantitative research approaches, including desk reviews, interviews, focus group discussions, content



analysis and mixed-method designs (Keskin & Palaz, 2024; Biswakarma & Bohora, 2025; Zelenyte, 2025; Mbuthia, 2018; Zhao et al., 2023; Ojo et al., 2025; Araújo et al., 2017; Dias & De Toni, 2018). However, some of these approaches may provide limited capacity for examining complex relationships involving multiple constructs and interaction effects (Fujii, 2018; Lowry & Gaskin, 2014). Therefore, this study employs Partial Least Squares Structural Equation Modelling (PLS-SEM) to examine the relationship between systems thinking and organizational performance, while assessing the moderating role of employee involvement culture.

Previous studies have examined the relationship between systems thinking and organizational performance across different national contexts, including Brazil, Pakistan, Malaysia, China, Kenya and Japan (Keskin & Palaz, 2024; Araújo et al., 2017; Dias & De Toni, 2018; Akhtar et al., 2018; Zhao et al., 2023). However, empirical evidence from Nigeria remains limited, particularly within Pension Fund Administrators. Consequently, caution is required when generalizing findings from other contexts to the Nigerian environment due to differences in institutional, regulatory and cultural conditions. Furthermore, Nigerian studies have largely focused on sectors such as banking, with limited attention given to the pension administration sub-sector (Ojo et al., 2025). Therefore, this study addresses this contextual gap by examining the relationship between systems thinking and organizational performance and assessing the moderating role of employee involvement culture among PFAs in Nigeria. Against this background, the study examines the relationship between systems thinking and organizational performance and investigates the moderating role of

employee involvement culture among PFAs in Nigeria. The hypotheses of the study are as follow:

- i. H_{01} : there is no significant relationship between continuous learning and organizational performance of PFAs in Nigeria.
- ii. H_{02} : there is no significant relationship between dynamic thinking and organizational performance of PFAs in Nigeria.
- iii. H_{03} : there is no significant relationship between mental models and organizational performance of PFAs in Nigeria.
- iv. H_{04} : there is no significant relationship between pattern recognition and organizational performance of PFAs in Nigeria.
- v. H_{05} : there is no significant relationship between process orientation and organizational performance of PFAs in Nigeria.
- vi. H_{06} : there is no significant relationship between systems logic and organizational performance of PFAs in Nigeria.
- vii. H_{07} : employee involvement culture does not significantly moderate the relationship between continuous learning and organizational performance of PFAs in Nigeria.
- viii. H_{08} : employee involvement culture does not significantly moderate the relationship between dynamic thinking and organizational performance of PFAs in Nigeria.
- ix. H_{09} : employee involvement culture does not significantly moderate the relationship between mental models and organizational performance of PFAs in Nigeria.
- x. H_{010} : employee involvement culture does not significantly moderate the relationship between pattern recognition and organizational performance of PFAs in Nigeria.



xi. H_{011} : employee involvement culture does not significantly moderate the relationship between process orientation and organizational performance of PFAs in Nigeria.

xii. H_{012} : employee involvement culture does significantly moderate the relationship between systems logic and organizational performance of PFAs in Nigeria.

2.0 Literature Review

This section reviews relevant literature on systems thinking, employee involvement culture, and organizational performance, with particular emphasis on their applicability to PFAs in Nigeria. The review establishes conceptual linkages among the variables and identifies gaps that justify the present study.

2.1 Conceptual Review

2.1.1 Organizational Performance

Organizational performance is one of the most significant variables researched by management scholars in recent times. It is a critical area of management which many scholars have given more attention in knowledge based global economy (Janadari, 2020). Organizational performance is the transformation of input into output to achieve organizational goal (Imran, Aziz, Hamid, Shabbir, Salman, & Jian, 2018). Chen, Sousa, and He, (2016) describe it as the relationship between effective cost and output, and between output and outcome. Ahmad, Farley and Soon, (2014) described organizational performance as value creation for both internal and external stakeholders. It is the efficient and effective utilization of resources, demonstration of responsiveness to customers' need and ensuring fairness among staff toward achieving organizational goal (Dahiru, 2025).

Moreover, Antony and Bhattachargy (2010) consider organizational performance as evaluation of organizational activities to

formulate and convey value to both internal and external stakeholders. Bruns (1992) identify organizational performance with cost reduction, value and job creation, lean production, competitiveness, growth and long-term survival of enterprise. Ghosh and Mukherjee (2006) explain that in evaluating organizational performance, the emphasis should be on examining the extant behavior of the organization in terms to its efficiency and effectiveness. In their view, the appropriate performance measurement tool should relate to strategic goals of the organization, be verifiable and focus on measurable outputs. In addition, Robbins and Timothy (2011) conceive performance as a measure of output, which is absolutely necessary to match performance measurement with the goals and objectives to be achieved, taking into consideration the levels of effectiveness and efficiency in the organization.

The review of Balance Score Card (BSC) developed by Kaplan and Norton (1996) shows both financial and non-financial components used to assess organizational performance. Kaplan and Norton (1998) evaluate organizational performance from four (4) concepts; financial, learning and growth, customer satisfaction, and internal business process which have been categorized into financial and non-financial, qualitative and quantitative, and objective and subjective approaches (Ayoup, Omar & Abdul Rahman, 2013; Popova & Sharpanskykh, 2010; & Ibrahim, 2015). Financial performance is measured using financial indicators such as return on investment (ROI), return on equities (ROE), return on asset (ROA), costs, sales, and growth, while non-financial performance measures include product quality, customer satisfaction, delivery on time, efficiency, effectiveness, responsiveness, equity,



productivity, market share, employee satisfaction, strategic goal attainment, workforce development and improvement (Richard, Devinney, Yip & Johnson, 2009). Although scholars differ in conceptualizing organizational performance, the common emphasis is on the extent to which organizations achieve strategic objectives through efficient resource utilization, stakeholder value creation, and operational effectiveness. Therefore, this study adopts organizational performance as a multidimensional construct encompassing efficiency, effectiveness, service quality, and goal attainment.

2.1.2 Systems Thinking

Systems thinking was developed in line with system theory (Bertalanffy, 1968) characterize with the interaction of its components. It is a critical element of strategic thinking predicated on the ability to take holistic view of an organization and its environment rather than individual component. This implies that organizations should view themselves as members of business ecosystem which cuts across different sectors (Dahiru, 2025). Liedtka (1998a) explained that system thinking is concerned with understanding of both internal and external context of the organization. The external context has been industry-based that has dominated strategy for many years which requires organizations to view themselves as members of business community cutting across different industries, and also, appreciate the interrelationship among the internal piece that, taken together, comprise the whole (Moore, 1993).

More so, Stacey (1996) understood systems thinking as the ability of managers to comprehend how organizations and managerial actions change over time, and the situations that lead to such changes.

Buckingham and Coffman (1999) explains that the systems thinking of a strategic thinker sees organizations from combination of different unrelated units/employees competing for organization resources to an overall system in which the relationship of every unit/employee or the entire organization is defined in an integrated manner. This indicates that units/employees will deviate from seeing the organization as combination of daily routine procedure to thinking of how different problems are related to each other, how they affect each other, and how solution to one problem affects the other (Bonn, 2001).

In the same vein, Liedtka (1998a) presented system thinking as mental model of complete end-to-end system of value creation and understanding of the interdependencies within the system. This suggests that system perspective requires employees to collect and accurately analyse information related to external business environmental in which the organization operates, and develop rational approaches to meet up with environmental changes (Dahiru, Bello & Ibrahim, 2024). Also, it requires the management to ensure even distribution of task among employees, restructures the organizational structure to meet up with external environmental challenges, and rewards creativity at work.

Moreover, previous studies have shown that systems thinking plays significant role in influencing organizational performance (Alatailat, Elrehail & Emeagwali, 2019). This shows that organizations that integrate system thinking into their operations, and are able to manage the inter-relationship between the external and internal business environment, may be able to improve their performance on the ground that adequate attention paid to the system and subsystem could yield positive outcome for the



organization. This study adopts systems thinking constructs developed by Palaima and Skarzauskiene (2010) which comprises continuous learning, dynamic thinking, understanding mental model, pattern recognition, process orientation, and systems logic. For PFAs, systems thinking is relevant because pension administration involves interconnected activities including investment decisions, regulatory compliance, customer service, risk management and contributor relations.

2.1.3 Continuous Learning

The concept of continuous learning has attracted the attention of scholars across disciplines such as organizational studies, management, and human resource development. For example, Hashemi-Pour and Chai (2025) defined continuous learning as a process through which individuals continually develop new competencies while reinforcing previously acquired knowledge in both formal and informal contexts. In a similar view, continuous learning is understood as a lifelong process of acquiring knowledge, experiences, and capabilities in order to adapt to changing circumstances and professional demands (Fatahillah, 2024). These perspectives emphasize the dynamic and lifelong nature of learning.

Scholars in organizational studies such as Senge (2006) describes continuous learning as the ongoing expansion of individuals' capacity to create desired results through reflection, inquiry, and the continual development of new knowledge and skills within a learning organization. Similarly, Argyris and Schön (1996) conceptualize continuous learning as a process in which individuals and organizations continually examine and modify their assumptions, behaviors, and strategies through feedback and reflection.

In workplace learning literature, continuous learning is the ability of organizations to create, acquire, interpret, and transfer knowledge while modifying behavior to reflect new insights (Garvin, 1993). Likewise, Edmondson (2012) describes continuous learning as the collective capability of teams to seek feedback, experiment, and reflect in order to improve performance over time.

Scholars in knowledge management such as Nonaka and Takeuchi (1995) also conceptualize continuous learning as a process of dynamic knowledge creation in organizations through the interaction of tacit and explicit knowledge. Again, Drucker (1999) emphasizes continuous learning as a necessary practice for knowledge workers to maintain relevance and effectiveness in rapidly changing environments. Despite differences in emphasis, this study conceptualize continuous learning as a continuous, dynamic, and evolving process that supports personal growth, organizational development, and societal progress.

2.1.4 Dynamic Thinking

Recent research in systems thinking describes dynamic thinking as the capacity to identify patterns of behavior in systems and interpret how these patterns evolve across time rather than focusing on individual events (Eidin, Bielik, Touitou, Bowers, McIntyre, Damelin, & Krajcik, 2023). Pamungkas, Waluya, Mariani, and Isnarto (2024) describe dynamic thinking as a cognitive process that enables learners to flexibly integrate strategies, monitor their reasoning processes, and adapt their approaches while solving complex problems. Their study identifies several core components of dynamic thinking, including conceptual understanding, monitoring of strategies, and adaptive reasoning.



Again, dynamic thinking is a complex cognitive process involving abstraction, information processing, and restructuring of knowledge in response to evolving problem contexts (Dwi Pamungkas, Waluya, Mariani & Isnarto, 2022). This perspective highlights the role of cognitive flexibility and knowledge transformation in dynamic reasoning. Such perspectives describe dynamic thinking as an adaptive mechanism that balances intuitive and analytical reasoning modes to optimize decision-making performance (Pan, Li, Lian, Snell, Zhou, Yala, Darrell, Keutzer & Suhr, 2025). In the field of artificial intelligence and cognitive modeling, dynamic thinking is defined as a reasoning strategy that dynamically adjusts the depth and mode of cognitive processing to address problems with varying complexity (Yao, Mi & Yu, 2024). This perspective highlights the adaptive and context-sensitive nature of thinking processes. Recent research in computational reasoning also conceptualizes dynamic thinking as a mechanism for adaptively distributing reasoning effort across different stages of problem solving, enabling efficient and flexible decision making (Guo, Chen, Meng, Gong, Yu, Wei & Chen, 2026).

From a socio-cognitive perspective, Chan (2026) conceptualizes dynamic thinking as a distributed cognitive process in which learners interact with external cognitive partners, such as artificial intelligence systems, to extend their reasoning capabilities across multiple learning situations. This definition highlights the role of collaborative and augmented cognition in contemporary learning environments. Within contemporary management and innovation research, dynamic thinking has been described as the ability to recognize interrelationships within complex systems

and use those insights to support innovation and organizational adaptation (Taylor, 2024). This definition emphasizes strategic thinking and organizational learning. For the purpose of this study, dynamic thinking is explained as multidimensional cognitive capability essential for navigating complex, uncertain, and rapidly changing environments. It enable individuals to interpret patterns of change, anticipate future developments, and adapt reasoning strategies.

2.1.5 Mental Models

Contemporary cognitive science literature conceptualizes mental models as structured internal descriptions of situations in the world that guide perception, memory, reasoning, and action (Summerfield, 2025). Mental models allow individuals to simulate possible scenarios and select appropriate responses in dynamic environments. According to Güneş (2022), a mental model represents a cognitive structure formed when individuals integrate prior knowledge with new information in order to interpret a situation or phenomenon. Mental models are described as cognitive frameworks that individuals use to understand how systems function and how different components of the world interact (Gosnell & Gordon, 2025). These frameworks shape decision-making processes and influence how individuals respond to environmental and social challenges.

Some scholars describe mental models as cognitive simulations that individuals use to predict how systems will behave under different conditions (Mohaddesi, Chicoine, Gong, Ergun, Griffin, Kaeli & Harteveld, 2023). Others define understanding mental models as the capacity to analyze and revise internal representations in response to new evidence or changing environments (Fayezioghani, 2023). Veith, Machisi,



Ubben, Hennig and Bitzenbauer (2025) conceptualize mental models as knowledge structures that learners construct in order to explain relationships between concepts and phenomena.

Recent design cognition research conceptualizes mental models as internal representations that guide individuals' understanding of systems, influencing how they think, behave, and collaborate in problem-solving contexts (Cash, Dekoninck & Ahmed-Kristensen, 2025). For the purpose of current study, understanding mental models involves recognizing and interpreting the internal cognitive frameworks through which individuals perceive reality, decision making, and interaction with complex systems.

2.1.6 Pattern Recognition

The concept of pattern recognition has become increasingly significant in contemporary scholarship across disciplines such as artificial intelligence, cognitive science, neuroscience, data analytics, and decision sciences. For example, Kazimova, Serikbayeva, Samashova, Zatyneyko and Sarsenbayeva (2025) explained that pattern recognition is the ability of computational systems to detect arrangements or recurring relationships within datasets in order to classify, interpret, or predict outcomes. Eysenck and Keane (2021) conceptualized pattern recognition as a mental process through which information received from the environment is matched with stored knowledge in memory in order to interpret and anticipate events.

Pattern recognition is conceived as a cognitive mechanism that links sensory input with previously stored knowledge structures to enable identification and prediction of environmental stimuli (Goldstein, 2022). This signifies that it is a computational process that enables systems

to automatically identify meaningful regularities in data through statistical learning techniques (Sharma, 2021).

Aggarwal (2021) explained that pattern recognition is the process of identification and classification of patterns in large datasets using algorithms that learn from examples. Contemporary research in artificial intelligence also conceived pattern recognition as the process through which intelligent systems analyze data structures in order to categorize inputs into meaningful classes (Goodfellow, Bengio, & Courville, 2021). It is a core capability of intelligent agents that enables them to interpret complex environments and make informed decisions (Nilsson, 2021). This perspective highlights the role of deep learning techniques in extracting complex hierarchical patterns from large datasets. For the purpose of this study, pattern recognition is considered as multidimensional concept encompassing cognitive, computational, and analytical processes through which meaningful patterns are identified within complex data or environment.

2.1.7 Process Orientation

The concept of process orientation has gained significant prominence in contemporary management, information systems, and organizational studies literature. For instance, recent research by Prabowo, Mursyada and Saifulloh (2025) defined process orientation as an organizational perspective that focuses on managing activities as integrated processes that collectively create value for customers and stakeholders. It is a managerial approach in which business processes are considered the primary unit of analysis and improvement within an organization (Ozkan, Koops, Türetken & Reijers, 2023). In this view, organizations focus on designing, monitoring, and optimizing



processes to enhance performance and operational efficiency.

Process orientation is an organizational capability that enables companies to coordinate activities across departments through clearly defined and continuously improved business processes (Harjanto & Mahendrawathi, 2023). Modern process management literature describes process orientation as a strategic management philosophy that emphasizes understanding how work is performed across organizational boundaries in order to improve efficiency, quality, and customer satisfaction (Ndalamba & Tomé, 2021). This study conceptualize process orientation as organizational philosophy and management approach that emphasizes viewing organizations as interconnected processes designed to deliver value to customers rather than as isolated functional departments.

2.1.8 Systems Logic

Systems logic is a systems thinking capability that enables individuals to understand internal and external forces shaping organizational change and system behavior (Pilato & Voss, 2024). It is a reasoning approach that focuses on relationships, feedback mechanisms, and interactions among system components rather than isolated variables (Stermann, 2020). This perspective highlights the importance of understanding how system elements interact within a larger network of interdependencies.

More so, systems logic is conceived as the cognitive ability to understand how components within a system interact to produce emergent behavior that cannot be explained solely by analyzing individual parts (Elsawah, Ho & Ryan, 2022). It is a cognitive capability that enables individuals to analyze cause-and-effect relationships within complex systems (Boers & Rypdal,

2021). This means it is the application of systemic reasoning to identify interdependencies among components within a dynamic environment (Meadows, 2021). This is the reasoning structure that allows individuals to interpret complex systems through relationships, interactions, and systemic causality (Cabrera & Cabrera, 2023). Consequently, this study conceived systems logic as the reasoning framework that enables individuals and organizations to interpret complex systems by analyzing the relationships, feedback mechanisms, and structural dynamics that influence system behavior over time.

2.1.9 Employee Involvement Culture (EIC)

Scholars believe that culture consists of values, beliefs and assumptions which are shared or communicated among members (Tierney & Schein, 1986). Denison and Mishra (1995) develop a model that helps to explain differences in performance of organizations (Sparrow, 2001). The model identified employee involvement culture as one of the essential elements in enhancing organizational performance.

Employee involvement culture gives employees opportunity to participate in determining the direction and operations of the organization. Glew, O'Leary-Kelly, Griffin and Van Fleet (1995) explained that it is an effort of management to provide opportunities for employees at middle and lower levels to participate and or contribute in one or more areas toward achieving organizational goal. Sofijanov and Zabijakin-Chatleska (2013) conceptualized employee involvement culture as participation of employees in decision making, problem solving and increased autonomy in work process.

Employee involvement culture is the empowerment and participation of



employees in decision making on activities suitable to their ranks in the organization (Kumari & Kumari, 2014). It is a joint decision making process between the management and subordinates (Dahiru, 2025). Engelen, Flatten, Thalmann and Brettel (2014) explained that employee involvement culture is determined by transparent communication, employee-focused leadership, and strong inter-personal relationship in organizations. Against the foregoing background, this study adopts the concept of employee involvement culture as deliberate management effort aimed at expanding responsibilities of employees or group of employees at different levels to discharge their responsibilities toward enhancing organizational performance (Dahiru, 2025).

2.2 Empirical Review

2.2.1 Continuous Learning and Organizational Performance

Recent study by Ojo, Salau, Akinlabi (2025) on continuous learning and employee performance in Nigerian banking sector used a sample of 331 respondents from selected money deposit banks. The results show that continuous learning significantly improves organizational performance. The findings of the study cannot be generalized on the grounds that the study focused on deposit money banks in Nigeria without considering pension subsector which would have made more contribution. Furthermore, although previous studies established the relationship between continuous learning and organizational performance, limited attention has been given to contextual factors that may strengthen or weaken this relationship, particularly employee involvement culture.

Again, Mbuthia (2018) examined the learning organization dimensions and organizational performance of commercial

banks in Kenya. The results showed that learning organization dimension positively influence organizational performance. Although findings of the study support positive relationships between dimensions of learning organization and organizational performance, but it actually provides mixed findings, which are highly valuable for current study. The findings of the study are judgemental given that it ignored other subsectors such as insurance. Nevertheless, the study recommended conduct of similar study in insurance industry.

However, the study by Keskin and Palaz (2024) investigates the relationship between organizational learning, organizational resilience capacity, and organizational performance within the banking sector. Conducted across twenty six (26) banks with five hundred and forty one (541) respondents, the study employed a cross-sectional survey design and analyzed data using Structural Equation Modelling (SEM) to ensure robustness in testing both direct and indirect relationships among constructs. Empirically, the study found no direct significant relationship between organizational learning and organizational performance. Instead, the relationship is fully mediated by organizational resilience. Thus, the findings cannot be generalized given that the study concentrated on banking sector without considering pension subsector.

2.2.2 Dynamic Thinking and Organizational Performance

Biswakarma and Bohora (2025) examined the relationship between dynamic capabilities and organizational performance, with organizational resilience serving as a mediating variable in the IT sector. The research is grounded in the dynamic capabilities framework, which emphasizes an organization's ability to sense, seize, and



reconfigure resources in response to environmental changes. The study adopts a cross-sectional survey method where data was collected from employees and managers within IT firms, and the analysis was conducted using Structural Equation Modelling (SEM) to test both direct and indirect relationships among the constructs. The results indicate that direct relationship between dynamic capabilities and organizational performance is weak or insignificant. This suggests that dynamic capabilities do not directly translate into improved performance unless they are effectively transformed into resilience capabilities. Thus, caution must be exercised in generalizing the findings on the ground that the study did not incorporate other equally important subsectors such as insurance. Although the study established relationship between dynamic thinking and organizational performance, little attention has been given to contextual factors that may strengthen or weaken this relationship, particularly employee involvement culture. This indicates a wide gap current study would address.

Again, Zelenyte (2025) adopts a systematic literature review methodology to examine how dynamic capabilities influence organizational performance within the context of digital business transformation. The research synthesizes existing empirical and conceptual studies rather than collecting primary data. The systematic review approach involves identifying, evaluating, and integrating prior scholarly works on dynamic capabilities, digital transformation, and organizational performance. The study reveal that dynamic capabilities generally exhibit a positive relationship with organizational performance. The review highlights that firms leveraging dynamic capabilities are better positioned to adapt to

technological changes, enhance operational efficiency, and sustain competitive advantage. However, the study also presents a mixed perspective rather than a purely linear positive relationship. It emphasizes that the impact of dynamic capabilities on performance is context-dependent, influenced by factors such as organizational culture. Although the study has established relationship between the dynamic thinking and organizational performance, but pays little attention to empirical data which would have been collected and analyzed using appropriate method. This reveled a wide gap which current study would fill.

Likewise, Akhtar, Awan, Naveed and Ismail (2018) examined the impact of systems thinking on organizational effectiveness within the banking sectors of Malaysia and Pakistan. In the study, dynamic thinking was considered as one of the key dimensions of systems thinking. The study adopted quantitative comparative research design using a cross-sectional survey approach. It employed structured questionnaires to obtain data from employees and managers working in commercial banks using. The data was analyzed using SEM and regression analysis. Statistically, the results show that dynamic thinking significantly influence organizational effectiveness in both country settings. Caution must be exercised in generalizing the findings of the study on the ground that it ignored other equally important sectors. Again, although previous study established the relationship between dynamic thinking and organizational effectiveness, limited attention has been given to contextual factors that may strengthen or weaken this relationship, particularly employee involvement culture. The study recommended conduct of similar study in other jurisdiction.



2.2.3 Mental Models and Organizational Performance

In a study conducted by Araújo, Gonçalves, Branco, and Braga (2017) examines the influence of mental models on organizational performance, drawing insights from neuroscience and psychosocial perspectives to explain behavioural dynamics within organizations. The authors adopt empirical analytical approach based primarily on a systematic review and conceptual synthesis of interdisciplinary literature from management studies, neuroscience, and psychology. The findings indicate that mental models significantly influence organizational performance through their effect on learning, decision-making, and behavioural alignment within organizations. The finding cannot be generalized on the ground that the variables were not independently verified empirically in a specific sector such as insurance. Furthermore, the study is silent about the moderating role employee involvement culture may play to strengthen or weaken the findings of the study.

More so, Dias and De Toni (2018) examined the influence of mental models on organizational performance within firms operating in the metal mechanic sector. The study employed a quantitative research design using a survey method. Data were collected through structured questionnaire from managers and employees in firms within the Brazilian metal mechanic industry. The researchers analyzed the data using correlation and regression analysis. The results demonstrate that mental models have a significant influence on organizational performance. The findings could be judgmental given that the study concentrate on Brazilian metal mechanic industry with limited emphasis on other industries such as pension subsector.

However, Zhao, Gao, Hao, and Ren (2023) examined how inconsistent mental models within organizations influence performance outcomes and how managerial interpretation and practice sets moderate this relationship. The study is grounded in cognitive and organizational learning theories, which emphasize that shared understanding among organizational members is essential for coordinated action and effective performance. The researchers employed a survey method where data was collected from top management teams and organizational members across firms in China. The data was analyzed using hierarchical regression analysis and moderation analysis. The findings indicate that inconsistent mental models among organizational members have a significant negative effect on organizational performance. When individuals within an organization interpret strategies, goals, and environmental conditions differently, coordination problems arise, leading to inefficiencies, delayed decision-making, and reduced organizational effectiveness. These inconsistencies weaken the organization's ability to implement strategies and adapt to environmental changes.

Likewise, Akhtar, Awan, Naveed and Ismail (2018) investigated impact of systems thinking on organizational effectiveness within the banking sectors of Malaysia and Pakistan. The study emphasizes on core dimensions of systems thinking which including understanding mental models, shared vision, team learning, and systems logic. The study employed a quantitative comparative research design using a cross-sectional survey approach. Data were collected from employees and managers working in commercial banks using structured questionnaires. The data was analyzed using SEM and regression



analysis. Empirically, the results indicate that understanding mental models does not have any effect on the organizational effectiveness in both country settings. The study seems to be silent about other variable such as employee involvement culture which would have strengthened or weakened the relationship between the constructs. Nevertheless, the study recommended conduct of further study in other sectors.

2.2.4 Pattern Recognition and Organizational Performance

Akhtar, Awan, Naveed and Ismail (2018) examined a comparative study of the application of systems thinking in achieving organizational effectiveness in the banking sector of Malaysia and Pakistan. The study focused particularly on systems-thinking components such as mental models, shared vision, team learning, and pattern recognition. The researchers adopted a quantitative comparative research design using a cross-sectional survey method. Data was collected from three hundred and sixty eight (368) employees working in commercial banks in both countries through a structured questionnaire. The study utilized structural equation modeling (SEM) and regression analysis to test the relationships between constructs. The study revealed that pattern recognition as a component of systems thinking has a positive and significant relationship with organizational effectiveness. Although the study has established the relationship between the constructs, but the result cannot be generalized on the ground that it focuses on banking industry only without considering other subsectors such as pension subsector.

Other empirical studies reported negative relationships between pattern recognition and organizational performance. For

example, Gavetti and Levinthal (2000) used computer simulations to examine the relationship between search processes that are forward-looking, based on actors' cognitive map of action-outcome linkages, and those that are backward-looking, or experience based. The result demonstrated that managers, sometimes perceive patterns where none existence, leading to illusory pattern recognition, which can produce flawed strategic decisions and poor organizational outcomes. Nevertheless, the study has validated the significance of pattern recognition to managers, but did not empirically demonstrate the relationship between the constructs. Therefore, caution must be exercised in generalizing the findings. Moreover, the study ignored other constructs such as dynamic thinking and continuous learning which would have made more contributions. This establishes a huge gap which current study will fill.

2.2.5 Process Orientation and Organizational Performance

The study conducted by Akhtar, Awan, Naveed and Ismail (2018) examined how the application of systems thinking contributes to organizational effectiveness in the banking sectors of Malaysia and Pakistan. The study focused on key systems-thinking dimensions viz; process orientation, mental models, shared vision, team learning, and systems logic. The study adopted a quantitative comparative research design using a cross-sectional survey method where data was retrieved through structured questionnaires from 386 employees and managers of commercial banks in both countries. The result of data analyzed using Structural Equation Modeling (SEM) showed that process orientation has a significant and positive relationship with organizational effectiveness in both Malaysian and Pakistani banks. Although



the findings confirm that process orientation contributes positively to organizational effectiveness, but caution must be exercised in generalizing the findings of the study given that it collected data from banking industry only, thereby excluding other equally important sectors such as pension subsector. Similarly, the study excluded the moderating effect of employee involvement culture on the relationship between the construct which would have made more contributions.

Skarzauskiene (2010) examined managing complex system through system thinking as catalyst for organization performance. Process orientation as one of the components of system thinking in the study. Multiple linear regression was used to test the hypothesis. The result revealed that a positive and significant relationship between process orientation and organizational performance with coefficient of $B = 0.37$ and $p = 0.00$. The research result may not be generalized to other sectors since the sample was limited only to national level. Moreover, the moderating effect of employee involvement culture on the relationship between the construct was not considered in the study, which leaves much to be desired. Thus, current study will address this gap.

Other empirical studies have also confirmed inconsistent relationship between process orientation and organizational performance. For example, a landmark research conducted by Tang, Pee, and Iijima (2013) on effect of business process orientation on organizational performance demonstrates that not all dimensions of business process orientation positively influence organizational outcomes. Their survey of Japanese organizations revealed that the process view dimension of BPO did not significantly affect innovation performance,

suggesting that process orientation alone may not improve organizational performance without supporting integration mechanisms. This study did not consider the moderating effect of employee involvement culture on the relationship between the constructs. Moreover, the study concentrated on organizations in Japan.

Another empirical study by Harjanto and Mahendrawathi (2023) examined business process orientation practices. The study found that several BPO practices do not directly influence organizational performance. The study reported that some process orientation practices such as supplier integration and organizational culture failed to demonstrate a direct effect on performance, indicating that the relationship is often mediated by other organizational capabilities. Nevertheless, the study did not consider the moderating effect of employee involvement culture which would have made more contributions. This exposes a huge gap which current study would fill.

2.2.6 Systems Logic and Organizational Performance

The study conducted by Akhtar, Awan, Naveed and Ismail (2018) examined the application of systems thinking in achieving organizational effectiveness in the banking sectors of Malaysia and Pakistan. In this study, system logic was considered as one of the several systems-thinking dimensions. Quantitative comparative research design using a cross-sectional survey method was adopted where data was collected through structured questionnaires administered to employees and managers in commercial banks in both countries. The result of data analyzed using Structural Equation Modeling (SEM) and regression analysis revealed that systems logic has insignificant relationship with organizational



effectiveness at a point where (β 0.061, $p > 0.05$) in both Malaysian and Pakistani banks. The findings are judgmental on the ground that other equally important industries such as the insurance were not considered. Again, the study ignored the moderating role employee employment culture would have played to influence the relationship between the constructs. This establishes a huge gap which this study will address.

In another landmark study, Skarzauskiene (2010) examined managing complex system through system thinking as catalyst for organization performance. The study considered systems logic as one of the major components of system thinking. The study employed multiple linear regression to test the hypothesis and the results show that systems logic significantly influence organizational performance ($B = 0.22$, $p = 0.00$). The research result lack generalizability, given that the sample was limited only to national level, therefore, it is not possible to implement the findings in another sector. Besides, the study did not consider the moderating effect of employee involvement culture on the relationship between the construct which current study would address.

2.2.7 Moderating Role of Employee Involvement Culture (EIC)

Organizational culture establishes operational ecosystem in which every employee tries to achieve the goal of the organization (Narayana, 2017). It is a system of values, beliefs, behaviours and idea instituted by organizations to guide employees on the operations of the organization. This indicates that understanding organizational culture is significant for the employees, stakeholders and organizations at large (Djangone & El-Gayar, 2021). This is because it is needed to facilitate organizational efficiency,

effectiveness, responsiveness and equity (Norman, Paramansyah & Abdan, 2022).

Denison (1996) argued that cultural dimensions work at individual and organizational level in organizations. This model suggested cultural dimensions of consistency, adaptability, involvement and mission. Studies have revealed that cultural dimensions influence organizational performance and have been conceptualized and modelled as moderator of organizational performance (Xu, Li, Yan, Cui, Liu & Zheng, 2024). Employee involvement culture moderates the relationship between knowledge process and infrastructure capabilities, and organizational performance (Dahiru, 2026a; & Dahiru, 2026b). Nonetheless, the researcher is not aware of any study that used employee involvement culture as a moderator on the relationship between systems thinking and organizational performance. This suggests the need to investigate extent to which organizational culture dimensions such as employee involvement culture may moderate the relationship between systems thinking and organizational performance.

Again, organizations must strive to facilitate involvement of their employees in system thinking within the organization. This is because employee involvement culture influences organizational performance (Ismail, Imran & Al Hosni, 2021, Faeq, 2022).

This study introduces employee involvement culture as a moderator on the relationship between systems thinking and organizational performance of PFAs in Nigeria on the ground that PFAs may facilitate involvement of their employees in systems thinking through continuous learning, dynamic thinking, understanding mental models, pattern recognition, process orientation and systems logic. Thus, current



study suggests that employee involvement culture may moderate the relationship between systems thinking (continuous learning, dynamic thinking, understanding mental models, pattern recognition, process orientation and systems logic) and organizational performance of PFAs in Nigeria.

2.3 Underpinning Theory: System Theory

System theory propounded by Bertalanffy (1968) conceptualizes organizations as complex, adaptive, and open systems composed of interdependent subsystems that interact continuously with one another and with the external environment. The theory emphasizes that organizational effectiveness is not merely a function of individual components, but rather the outcome of the quality of interactions, coordination, and feedback among these components (Katz & Kahn, 1978). While Systems Theory provides the theoretical foundation for understanding organizations as interconnected systems, systems thinking represents the practical managerial application of systems theory principles in diagnosing relationships, feedback mechanisms, and organizational dynamics. Systems thinking is a critical managerial capability that enables decision-makers to understand and manage complex interrelationships within an organization. It shifts attention from linear cause-effect reasoning to a more holistic appreciation of patterns, feedback loops, and systemic structures (Senge, 2006; Sterman, 2000). In the context of PFAs, it is assumed that continuous learning enables PFAs to receive feedback from internal and external environments and adjust processes accordingly; dynamic thinking reflects the ability of PFAs to understand changing relationships among system components; mental models enables employees to

identify how individual perceptions influence organizational decisions; pattern recognition enables intelligent systems to analyze data structures in order to categorize inputs into meaningful classes; process orientation views PFAs as interconnected processes designed to deliver value to customers rather than as isolated functional departments; while systems logic enables employees and organizations to interpret complex systems by analyzing the relationships, feedback mechanisms, and structural dynamics that influence system behavior over time.

Moreover, recent empirical studies suggest that systems thinking enhances organizational performance by promoting integration, coordination, and strategic alignment (Siriram & Plessis, 2024; Sumairah & Zainon, 2024). For instance, studies on continuous learning demonstrates that systems-oriented organizations are better able to optimize processes and achieve superior performance outcomes (Garcia & Martinez, 2024).

Systems theory posits that organizations that effectively adopt systems thinking are more likely to achieve superior organizational performance on the ground that they can better coordinate activities, anticipate unintended consequences, and adapt to environmental changes (Bertalanffy, 1968; Katz & Kahn, 1978). Nevertheless, systems theory also underscores that the effectiveness of any system depends not only on its structural configuration but also on the quality of interactions among its components. Although systems thinking provides the cognitive capability required for managing organizational complexity, its effectiveness depends on the extent to which employees are encouraged to participate, share knowledge, and contribute to decision-making. Therefore, employee involvement

culture may strengthen the relationship between systems thinking and organizational performance.

In the Nigerian pension industry, PFAs operate within a highly regulated system overseen by the National Pension Commission. This environment requires continuous coordination among investment management, compliance, customer service, and risk management functions. Systems thinking is therefore critical for ensuring that decisions in one area do not negatively affect other subsystems. Despite its relevance, empirical research on systems thinking within Nigerian PFAs remains limited, creating a gap that this study seeks to address.

In summary, this theoretical framework suggests that systems theory along with the constructs of systems thinking (continuous learning, dynamic thinking, understanding mental models, pattern recognition, process

orientation and systems logic), employee involvement culture, and organizational performance may provide a comprehensive explanation of how PFAs can achieve superior performance. Systems thinking dimensions may enhance organizational performance through moderating role of employee involvement culture. This study assumes that Systems Theory provides a basis for expecting that organizations with stronger systems thinking capabilities may achieve improved performance because they are better positioned to coordinate resources, manage complexity, and adapt to environmental changes. This proposed framework offers a strong theoretical basis for empirically examining the moderating effect of employee involvement culture on the relationship between systems thinking and organizational performance in the Nigerian pension industry.

Dependent Variables

Moderator Independent Variable

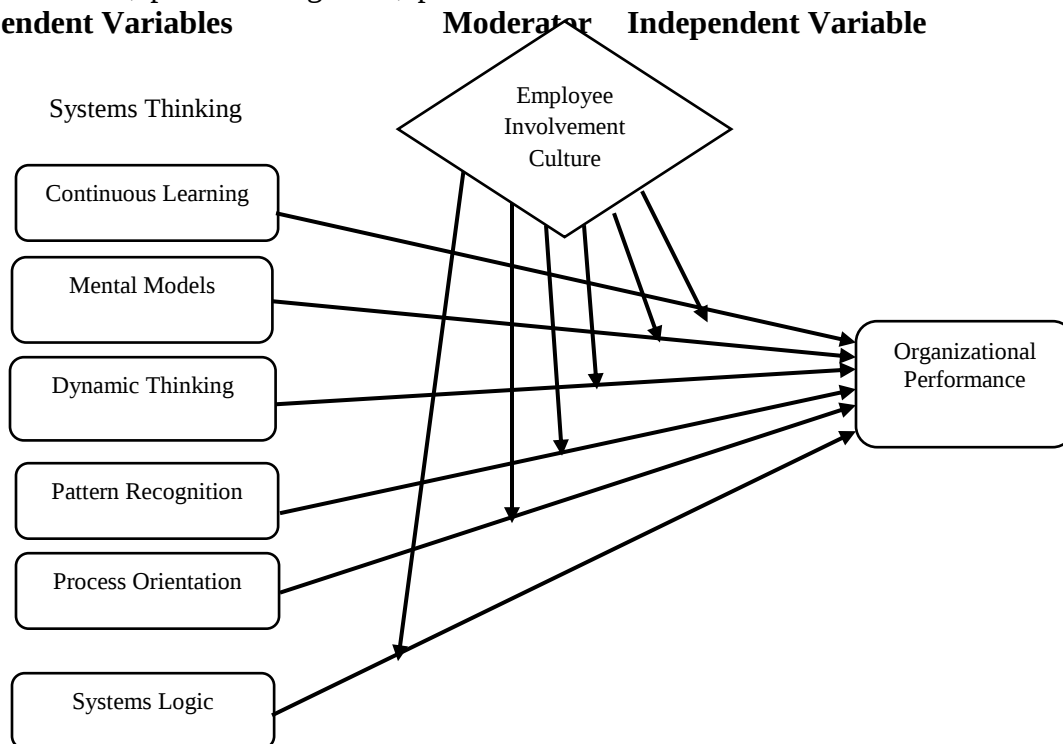


Figure 1: Conceptual Framework of the Study

Source: Developed by the Researcher



3.0 Methodology

This study employed cross sectional survey design. The cross-sectional survey design was considered appropriate because the study seeks to examine the prevailing perceptions and relationships among systems thinking, employee involvement culture, and organizational performance at a specific period. It focuses on the nineteen (19) Pension Fund Administrators (PFAs) licensed by National Pension Commission in Nigeria. The study considered ten (10) out of the nineteen (19) licensed PFAs which were selected using purposive sampling based on market share. The ten PFAs selected accounted for a substantial proportion of pension assets under management, making them suitable representatives of the Nigerian pension industry. A multistage sampling technique was adopted. First, PFAs were selected purposively based on market share. Second, employees within the selected PFAs were selected using simple random sampling. Krejcie and Morgan (1970) formula for determination of sample size was utilized to arrive at a sample of two hundred and eighty two (282) out of three hundred and sixty eight (368) population of the study.

This study used questionnaire to collect data from respondents. It utilized a five (5) point Likert Scale with questions ranging from “1” for Strongly Disagree to “5” for Strongly Agree to measure the variables. Systems thinking was operationalized as a multidimensional construct consisting of Six (6) reflective dimensions adapted from Palaima et al. (2010) where continuous learning has seven (7) items, dynamic thinking nine (9) items, mental models six (6) items, pattern recognition three (3) items, process orientation four (4) items, and systems logic four (4) items. Organizational performance is measured using eight (8)

items adapted from Song (2016) while employee involvement culture six (6) items adapted from Denison (1990).

The questionnaire was administered electronically through social media (WhatsApp) handles of the staff of ten (10) licensed PFAs considered for this study using Google Form. Electronic administration was adopted due to the geographical dispersion of PFA employees across Nigeria and to facilitate efficient data collection. The phone numbers of the PFA staff across all the states in Nigeria were retrieved from websites of the ten (10) PFAs. Participation was voluntary and respondents were informed that the data collected would be used strictly for academic purposes while maintaining confidentiality and anonymity. A total of two hundred and eighty two (282) questionnaires were administered to the respondents, out of which one hundred and ninety six (196) were returned representing (69.5%) of the questionnaire administered. The response rate exceeded the commonly accepted threshold for survey research, making the data suitable for further analysis. This study utilizes SmartPLS 4.0 software to perform Partial Least Squares Structural Equation Modeling (PLS-SEM), focusing on the two core components: the measurement model and the structural model, as recommended by Ringle, Sarstedt and Straub (2012). This study utilized PLS-SEM on the grounds that it estimates complex models involving multiple latent constructs and moderating relationships while accommodating relatively small samples (Ringle, et al. 2012). Furthermore, it supports the development and validation of theoretical models (Abubakar, Inusa, Aminu & Karwai, 2024; & Hair Matthews, Matthews & Sarstedt, 2017).



A pilot study was conducted to determine the reliability of the questionnaire using *Cronbach's Alpha* which measures internal consistency to establish the extent to which certain items within the scale measure the same construct (Saunders, Lewis & Thornhill, 2009). Saunders et al. (2009) recommended a *Cronbach's Alpha* threshold of 0.7. The pilot study assesses validity and reliability of data collected (Saunders et al., 2009). Construct validity was assessed through convergent validity and discriminant validity during the measurement model evaluation. This study used ninety (90) respondents as population of the pilot study given that Johanson and Brooks (2010) proposed minimum of thirty (30) sample size for a pilot study. The pilot respondents were excluded from the final study to avoid response contamination. The test of the reliability result for the pilot study indicate that all the items attain high reliability coefficient. The results range between 0.727 to 0.963 which are in conformity with the opinions of Sekaran and Bougie (2016) who recommended 0.60 as an average reliability and a coefficient of 0.70 and above as high reliability. This means

that the reliability results suggest acceptable internal consistency among the measurement items.

4.0 Results

4.1 Measurement Model Assessment

The traditional criterion for assessing internal consistency is the *Cronbach's alpha* coefficient that provides an estimate of the reliability based on the intercorrelations among indicators (Cronbach & Shavelson, 2004). Despite the popularity of alpha coefficient, it has been criticized for being sensitive to the number of items in a construct and underestimates the true internal consistency reliability, and hence Composite Reliability (CR) has been suggested as an alternative criterion especially in SEM (Hair et al., 2017). Consequently, this study employed CR to determine internal consistency of the items given that it has been suggested that a reflective latent construct is said to be reliable when it has at least 0.60 value of CR (Hair et al, 2017), which ranges between 0.76 to 0.89 for this study. The results supporting the reliability and validity of the constructs are illustrated in Figure 2 and Table 1.

Table 1: Convergent Validity – Composite reliability and Average Variance Extraction

	Composite reliability (rho)	Average variance extracted (AVE)
Continuous Learning	0.897	0.558
Dynamic Thinking	0.760	0.529
Employee Involvement Culture	0.840	0.522
Mental Models	0.765	0.522
Organizational Performance	0.953	0.716
Process Orientation	0.854	0.662
Pattern Recognition	0.859	0.673
Systems Logic	0.838	0.568

Source: Field Survey, 2026

The most common method of establishing the convergent validity of the reflective construct is the Average Variance Extracted

(AVE). They further argued that AVE is the grand average of the squared loadings of the indicators of a particular construct.

Generally, scholars recommend that an AVE value of 0.50 or above indicates the construct has a convergent validity (Chin, 1998; Hair et al., 2017). This is logical because an AVE with 0.50 signifies that the latent construct explains half of the variance of its items or factors (Hair et al., 2017). Thus, following the threshold level of 0.50

value for the AVE, all the constructs have convergent validity as each construct has an AVE level above 0.50. From the table 1 above, all the constructs are reliable given that all their respective composite reliability's values and AVE are above the threshold of 0.60 and 0.50 respectively.

Table 2: Discriminant validity – Fornell-Larcker criterion

	CL	DT	EIC	MM	OP	PO	PR	SL
CL	0.747							
DT	0.427	0.727						
EIC	0.303	0.41	0.722					
MM	-0.166	-0.031	0.106	0.722				
OP	0.699	0.67	0.368	-0.108	0.846			
PO	0.144	0.164	0.166	-0.084	0.203	0.813		
PR	0.654	0.173	0.196	-0.122	0.385	0.206	0.821	
SL	0.123	-0.071	-0.189	0.004	0.086	-0.177	-0.068	0.754

Source: Field Survey, 2026

As can be seen from Table 2, all the reflective latent constructs of current study have discriminant validity as the square roots of their respective AVEs which are above their correlation with other constructs of the study. Hence, each of the latent constructs of the present study is

distinctively different from one another as none of them is highly correlated with each other. More importantly, each of the said constructs is unique and captures phenomena not represented by other reflective latent constructs based on Fornell and Larcker's (1981) criterion analysis.

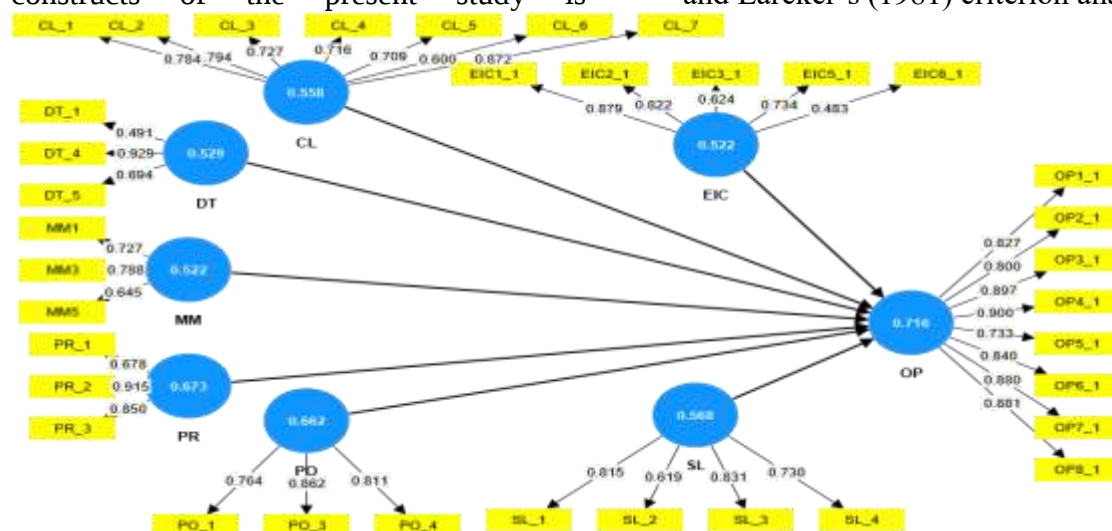


Figure 2: PLS-SEM algorithm

Source: Field Survey, 2026



Another method for assessing the discriminant validity of reflective constructs is by examining the cross-loadings of their respective indicators (Hair et al., 2017). Specifically, for a latent variable to have discriminant validity using cross-loadings method, all its indicators loadings should be greater than their corresponding loadings

(cross-loadings) on other constructs. Hair et al. (2017) are of the view that cross loading is generally considered a rather liberal criterion in terms of establishing discriminant validity. Thus, the assessment of the discriminant validity based on the cross-loadings criterion is presented in Table 3.

Table 3: Discriminant validity – Cross Loading

	CL	DT	EIC	MM	OP	PO	PR	SL
CL_1	0.784	0.457	0.426	-0.033	0.562	0.021	0.543	0.206
CL_2	0.794	0.279	0.139	-0.167	0.379	0.161	0.566	0.203
CL_3	0.727	0.105	0.203	-0.11	0.354	0.18	0.583	-0.015
CL_4	0.716	0.29	0.172	-0.206	0.298	0.169	0.413	-0.083
CL_5	0.709	0.235	0.141	-0.082	0.247	0.001	0.556	-0.044
CL_6	0.600	0.392	0.225	-0.055	0.8	0.149	0.299	0.081
CL_7	0.872	0.24	0.122	-0.283	0.459	0.045	0.558	0.135
DT_1	0.148	0.491	0.177	-0.165	0.154	-0.004	-0.016	-0.05
DT_4	0.442	0.929	0.429	0.065	0.733	0.196	0.241	-0.054
DT_5	0.201	0.694	0.161	-0.205	0.251	0.04	-0.055	-0.075
EIC_1	0.145	0.242	0.879	0.103	0.325	0.199	0.178	-0.092
EIC_2	0.153	0.416	0.822	0.057	0.322	0.319	0.115	-0.267
EIC_3	0.415	0.391	0.624	0.081	0.236	-0.191	0.149	0.004
EIC_5	0.3	0.194	0.734	0.16	0.238	0.02	0.216	-0.205
EIC_6	0.136	0.236	0.483	-0.043	0.171	0.182	0.033	-0.099
MM_1	-0.046	0.024	0.178	0.727	-0.078	0.077	0.02	-0.067
MM_3	-0.112	-0.042	0.044	0.788	-0.097	-0.156	-0.119	0.067
MM_5	-0.274	-0.062	-0.019	0.645	-0.046	-0.1	-0.212	-0.014
OP_1	0.668	0.482	0.308	-0.129	0.827	0.039	0.324	0.27
OP_2	0.6	0.392	0.225	-0.055	0.800	0.149	0.299	0.081
OP_3	0.643	0.58	0.25	-0.125	0.897	0.259	0.328	0.016
OP_4	0.576	0.459	0.282	-0.138	0.900	0.19	0.322	0.065
OP_5	0.442	0.929	0.429	0.065	0.733	0.196	0.241	-0.054
OP_6	0.646	0.582	0.441	-0.08	0.840	0.061	0.423	0.133
OP_7	0.6	0.552	0.212	-0.155	0.880	0.254	0.336	0.031
OP_8	0.549	0.436	0.294	-0.14	0.881	0.23	0.322	0.047
PO_1	0.152	0.181	0.148	0.064	0.184	0.764	0.202	-0.165
PO_3	0.125	0.085	0.149	-0.099	0.177	0.862	0.177	-0.073
PO_4	0.051	0.131	0.092	-0.227	0.118	0.811	0.099	-0.218
PR_1	0.348	-0.042	-0.039	-0.11	0.157	0.051	0.678	-0.172
PR_2	0.674	0.138	0.197	-0.108	0.423	0.189	0.915	-0.019
PR_3	0.495	0.267	0.236	-0.093	0.278	0.225	0.850	-0.051

SL_1	0.034	-0.138	-0.299	0.038	0.073	-0.04	-0.038	0.815
SL_2	0.082	0.044	0.026	-0.083	0.031	-0.25	-0.031	0.619
SL_3	0.165	-0.026	-0.081	-0.012	0.069	-0.207	-0.067	0.831
SL_4	0.053	-0.151	-0.243	-0.126	-0.009	-0.211	0.042	0.730

Source: Field Survey, 2026

4.2 Assessment of Structural Model and Hypothesis Testing

The structural model was evaluated using path coefficients (β), T-statistics, and P-values obtained through bootstrapping to test both direct and moderating

relationships. The results provide insights into the significance and strength of the hypothesized relationships influencing organizational performance (OP).

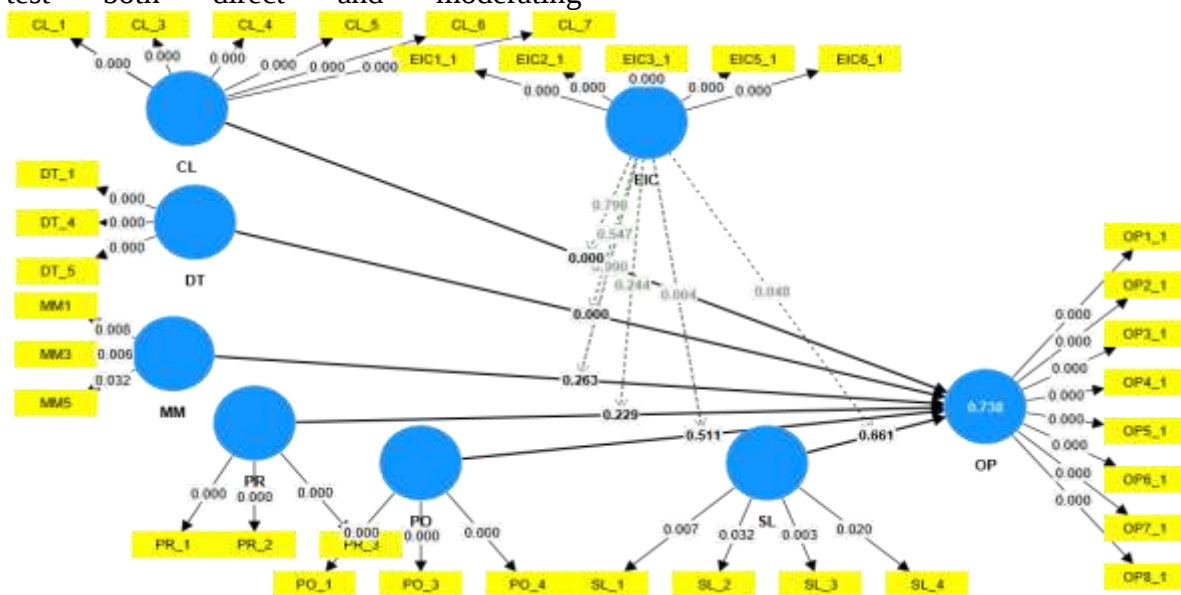


Figure 3: Bootstrapping

Source: Field Survey, 2026

Figure 3 above showed the diagrammatic presentation of the blindfolding result indicating the predictive relevance of the moderating variables. It clearly indicates

that there is a path model predictive relevance on Organizational performances (Hair et al., 2017).

Table 4: Hypothesis test for direct and moderating relationships

Hypothesis	Relationship	Beta values	Standard deviation (STDEV)	T statistics ((O/STDEV))	P values	Decision
H ₀₁	CL -> OP	0.63	0.07	8.56	0.00	Rejected
H ₀₂	DT -> OP	0.32	0.07	4.35	0.00	Rejected
H ₀₃	MM -> OP	-0.08	0.07	1.12	0.26	Accepted
H ₀₄	PO -> OP	0.03	0.05	0.65	0.51	Accepted
H ₀₅	PR -> OP	-0.09	0.07	1.20	0.22	Accepted
H ₀₆	SL -> OP	0.02	0.06	0.43	0.66	Accepted



H₀₇	EIC x SL -> OP	0.30	0.15	1.98	0.04	Rejected
H₀₈	EIC x PO -> OP	-0.18	0.06	2.88	0.00	Rejected
H₀₉	EIC x PR -> OP	0.10	0.08	1.16	0.24	Accepted
H₀₁₀	EIC x MM -> OP	-0.00	0.06	0.01	0.99	Accepted
H₀₁₁	EIC x DT -> OP	-0.05	0.08	0.60	0.54	Accepted
H₀₁₂	EIC x CL -> OP	0.02	0.10	0.25	0.79	Accepted

Source: Field Survey, 2026

4.3 Discussion of Findings

The findings of current study are discussed based on hypothesis developed in line with the research objectives, questions and statement of problems. These findings are discussed in the next section.

4.3.1 Direct Relationships

Hypothesis H₀₁ which states that there is no significant relationship between continuous learning and organizational performance of PFAs in Nigeria was rejected. The results indicate that CL has a strong and statistically significant positive effect on OP ($\beta = 0.63$, $T = 8.56$, $p < 0.001$). The high T-value and near-zero P-value provide robust evidence against the null hypothesis, leading to its rejection. This implies that CL is a major determinant of organizational performance and contributes substantially to organizational performance. This finding is consistent with the study by Ojo, Salau, Akinlabi (2025) which also reported that continuous learning significantly enhances organizational performance.

Again, Hypothesis H₀₂ which states that there is no significant relationship between dynamic thinking and organizational performance of PFAs in Nigeria is rejected. The results demonstrates that DT has a significant positive relationship with OP ($\beta = 0.32$, $T = 4.35$, $p < 0.001$). Although the magnitude is lower than that of CL, the relationship remains statistically significant, indicating that DT plays an important but comparatively moderate role in enhancing

performance, which is similar to the study by Biswakarma and Bohora (2025).

In contrast, Hypothesis H₀₃ which states that there is no significant relationship between mental models and organizational performance of PFAs in Nigeria is accepted. The relationship between MM and OP is negative and statistically insignificant ($\beta = -0.08$, $T = 1.12$, $p = 0.26$). Since the P-value exceeds 0.05, the null hypothesis is accepted. This suggests that MM does not significantly influence organizational performance in this model. This findings is similar to the study by Zhao, Gao, Hao, and Ren (2023) which reported insignificant relationship between mental models and organizational performance.

More so, Hypothesis H₀₄ which states that there is no significant relationship between process orientation and organizational performance of PFAs in Nigeria is accepted. This is because PO exhibits a very weak positive but insignificant relationship with OP ($\beta = 0.03$, $T = 0.65$, $p = 0.51$). The low T-value indicates minimal explanatory power, leading to acceptance of the null hypothesis. Thus, PO does not directly affect performance, which supports the study by Harjanto and Mahendrawathi (2023).

Hypothesis H₀₅ which states that there is no significant relationship between pattern recognition and organizational performance of PFAs in Nigeria is accepted on the grounds that PR shows a negative but insignificant relationship with OP ($\beta = -0.09$, $T = 1.20$, $p = 0.22$). The lack of



statistical significance suggests that PR does not meaningfully contribute to performance outcomes. The findings validates the study by Gavetti and Levinthal (2000) which reported negative relationship between pattern recognition and organizational performance.

Finally, Hypothesis H_{06} which states that there is no significant relationship between systems logic and organizational performance of PFAs in Nigeria is accepted. The results show that SL has a negligible and statistically insignificant negative effect on OP ($\beta = 0.02$, $T = 0.43$, $p = 0.66$). This indicates that SL alone does not directly influence organizational performance. This result confirms the study by Skarzauskiene (2010), which revealed that systems logic does not influence organizational performance.

4.3.2 Moderating Effects

Hypothesis H_{07} which states that there is no significant moderating effect of employee involvement culture on the relationship between systems logic and organizational performance of PFAs in Nigeria is rejected on the grounds that the interaction between EIC and SL is positive and statistically significant ($\beta = 0.30$, $T = 1.98$, $p = 0.04$). With the P-value below 0.05, the null hypothesis is rejected. This indicates that EIC strengthens the relationship between SL and OP, suggesting that SL becomes more effective in improving performance when EIC is high.

Hypothesis H_{08} which states that there is no significant moderating effect of employee involvement culture on the relationship between process orientation and organizational performance of PFAs in Nigeria is rejected. The moderating effect of EIC on the PO and OP relationship is negative and significant ($\beta = -0.18$, $T = 2.88$, $p < 0.01$). This result leads to rejection of

the null hypothesis. It implies that higher levels of EIC weaken the impact of PO on organizational performance.

Hypothesis H_{09} which provides that there is no significant moderating effect of employee involvement culture on the relationship between pattern recognition and organizational performance of PFAs in Nigeria is accepted on the grounds that the interaction effect between EIC and PR is positive but statistically insignificant ($\beta = 0.10$, $T = 1.16$, $p = 0.24$). The null hypothesis is accepted, indicating no moderating influence of EIC on this relationship.

Hypothesis H_{010} which provides that there is no significant moderating effect of employee involvement culture on the relationship between understanding mental models and organizational performance of PFAs in Nigeria. This is because the moderating effect of EIC on MM is essentially zero and statistically insignificant ($\beta \approx 0.00$, $T = 0.01$, $p = 0.99$). This confirms the absence of any interaction effect.

H_{011} which provides that there is no significant moderating effect of employee involvement culture on the relationship between dynamic thinking and organizational performance of PFAs in Nigeria is accepted on the grounds that EIC does not significantly moderate the DT and OP relationship ($\beta = -0.05$, $T = 0.60$, $p = 0.54$). The null hypothesis is accepted, indicating no conditional effect.

Finally, H_{012} which states that there is no significant moderating effect of employee involvement culture on the relationship between continuous learning and organizational performance of PFAs in Nigeria is accepted. This is because EIC does not moderate the CL and OP relationship ($\beta = 0.02$, $T = 0.25$, $p = 0.79$).



The relationship between CL and OP remains stable regardless of EIC levels.

The findings reveal that only CL and DT have direct and statistically significant effects on organizational performance, highlighting them as the primary drivers within the model. CL, in particular, emerges as the most influential predictor, suggesting that it plays a critical role in shaping performance outcomes. On the other hand, MM, PO, PR, and SL do not exhibit significant direct effects. This may indicate that their influence on performance is either indirect, context-dependent, or insufficiently captured by the current measurement model. The moderating analysis provides further insight into these dynamics. EIC plays a selective moderating role, significantly influencing only two relationships. Its positive moderation of the SL–OP relationship suggests that EIC enhances the effectiveness of SL in improving performance. In contrast, its negative moderation of the PO–OP relationship indicates that EIC may constrain or interfere with the effectiveness of PO. The absence of moderation in other relationships suggests that EIC does not universally condition all organizational factors, but rather operates in a targeted and context-specific manner.

5.1 Conclusion and Recommendations

This study investigated the direct influence of continuous learning (CL), dynamic thinking (DT), mental models (MM), pattern recognition (PR), process orientation (PO), and systems logic (SL) on organizational performance (OP), while also examining the moderating role of employee involvement culture (EIC). The findings provide evidence on how systems thinking dimensions and employee involvement culture shape organizational performance among Pension Fund Administrators (PFAs) operating in Nigeria's regulated pension environment.

The study concludes that organizational performance is primarily influenced by continuous learning and dynamic thinking, while mental models, pattern recognition, process orientation and systems logic did not demonstrate significant direct effects on organizational performance within the sampled PFAs. Employee involvement culture was found to significantly moderate the relationships between systems logic and organizational performance, and between process orientation and organizational performance, highlighting the significance of organizational context in shaping performance outcomes. Based on the findings, several recommendations are proposed for organizational practice and policy.

First, PFAs should institutionalize continuous learning through regular regulatory updates, investment knowledge development, technology training and knowledge-sharing mechanisms among employees. This includes creating structures and processes that support knowledge sharing, ongoing training, and organizational learning. Given the strong impact of CL on OP, fostering a learning culture should be a strategic priority for organizations seeking to improve performance.

Second, PFAs should strengthen employees' adaptive capabilities by promoting scenario planning, environmental scanning, innovation, and flexible decision-making processes. This can be achieved through training programmes that emphasize critical thinking, innovation, and adaptive problem-solving. Encouraging employees to think beyond conventional approaches will enhance the organization's ability to respond to complex and changing environments.

Third, PFAs should strengthen employee involvement culture by encouraging participation and knowledge sharing while



ensuring that involvement mechanisms do not create excessive delays in process execution. A participatory culture fosters collaboration and improves the integration of organizational processes.

Fourth, since excessive employee involvement weakened the process orientation–performance relationship, PFAs should ensure that employee participation is supported by clear roles, decision boundaries, and efficient workflow structures. While standardized processes are important for efficiency and consistency, excessive rigidity may limit flexibility, particularly in environments with high employee involvement culture. Organizations should therefore design processes that allow for adaptability and employee input.

Fifth, although mental models, pattern recognition, and systems logic did not demonstrate significant direct effects, PFAs should continue to integrate these capabilities because they support long-term learning, adaptation, and decision quality when combined with continuous learning and dynamic thinking. Their value lies in how they complement and reinforce learning and adaptive thinking processes.

5.2 Suggestions for Future Study

Future research should build on the findings of this study in several important ways. First, given that employee involvement culture moderated only selected relationships, future studies may investigate other contextual variables that explain why some systems thinking dimensions translate into improved performance while others do not.

Second, since the current study adopted a cross-sectional design, future research may employ longitudinal approaches to determine whether improvements in systems thinking capabilities produce sustained

changes in organizational performance over time. Third, comparative studies across different industries, sectors, and national contexts are recommended to assess the generalizability of the findings. Such research would help identify context-specific factors that influence the effectiveness of organizational capabilities.

Fourth, qualitative and mixed-method approaches should be employed to gain deeper insights into how organizations develop and apply these concepts in practice. Case studies and interviews could provide a richer understanding of the mechanisms underlying the observed relationships. Finally, future research may compare PFAs with other financial institutions such as insurance companies, banks, and investment firms to determine whether the observed relationships are sector-specific or applicable across financial service organizations.

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Appendix A

Measures of Organizational Performance (8 items)

Time in handling the tasks of our organization is reduced.
Cost of carrying out tasks in our organization is reduced.
Accuracy of business process of our organization is improved.
Administrative efficiency of our organization is improved.
Planned goal of our organization is attained.
The quality of business process of our organization is improved.
Business productivity of our organization is improved.
Our organization continually realizes and promptly reacts to the demands of client.

Measures of Systems Thinking Construct

Continuous learning (7 items)

Discuss mistakes.
Identify skills needed for tasks.
Adapt to shifting priorities.
Resources to support learning.
Discuss ideas with others.
View problems as opportunity to learn.
Learn from others mistakes.

Dynamic thinking (9 items)

Important to understand details related to tasks.
Focus on own portion of task.
Assume other people take care of their portion.
Identify benefits arising from integration.
Important to know other people do in organization.
Look at interconnections between own work and others work.
Important to acquire knowledge in addition to self own's expertise.
Evaluate problems by analyzing different factors.
Explain complex events through systems diagram.

Understanding Mental Models (6 items)

Different point of view as a source of information.
Change beliefs based on new experiences.
Frequently socialize.
Provide helpful feedback.

Conscious of accomplishment.
Conscious of putting creativity to use.

Pattern Recognition (3 items)

Use metaphors to describe patterns.



Identify trends in structures.

Interpret situation using analogy relating it to different type of situation.

Process Orientation (4 items)

Understand implemented business processes.

Integrate processes into a whole for progress.

Organization as a system of processes.

Verify how new development will integrate into whole.

Systems logic (4 items)

External forces affecting organizational change.

Internal forces affecting change.

Understand interrelationships between jobs.

Understand growth barriers.

Measures of Employee Involvement Culture (6 items)

Most employees are highly involve in their work.

Decisions are usually made at each level that best information is available.

Information is widely shared so that everyone can get the information he or she wants when it's needed.

Everyone believes that he or she can make a positive impact.

Business planning is ongoing and involves everyone in the process to some degree.

Cooperation across different parts of the organization is actively encouraged.