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v, Structural, and Interactive Approaches to Human Resource Empowerment

ABSTRACT

The objective of this study is to develop a neurocognitively informed model integrating cognitive, structural, and interactive mechanisms of human resource empowerment in governmental organizations. This qualitative study employed a phenomenological design to explore the lived experiences of nine senior human resource managers from governmental organizations across multiple provinces. Participants were selected through purposive sampling until theoretical saturation was reached. Data were gathered through in-depth, semi-structured interviews and validated using member checking. The second analytical phase used theoretical sampling to conduct implication-based analysis grounded in neuroscientific literature. Phenomenological reduction, horizonalization, thematic clustering, and textural–structural synthesis guided the qualitative analysis, while neurocognitive concepts were extracted through a structured implication-identification framework linking neural processes with empowerment phenomena. The analysis revealed that cognitive empowerment is reinforced through neural mechanisms related to learning, dopaminergic activation, myelination, focused attention, and hippocampal strengthening, leading to improved decision-making speed, accuracy, and attitude change. Structural empowerment was associated with autonomy-driven neural reward activation, dendritic network growth, and strengthened executive functioning, enhancing leadership, problem-solving capability, crisis management, and conflict resolution. Interactive empowerment corresponded with social-reward circuits, oxytocin release, emotional regulation, and prefrontal social-cognition development, producing higher teamwork tendency, stronger interpersonal communication, and greater enjoyment in organizational participation. Together, the results indicate that empowerment emerges from interconnected neural, cognitive, and social systems rather than isolated managerial interventions. Empowerment in governmental organizations is a multidimensional phenomenon supported by integrated neurocognitive, structural, and social mechanisms, indicating that sustainable empowerment requires interventions that simultaneously cultivate learning, autonomy, and social connectedness.

Keywords: Human resource empowerment; neurocognition; cognitive approach; structural empowerment; interactive empowerment; phenomenology; decision-making; autonomy; social cognition.

Introduction

Human resource empowerment has emerged as a central construct in contemporary organizational research, particularly within public-sector systems where human capital is the primary driver of institutional performance, adaptability, and innovation. Empowerment in modern organizations is no longer limited to the delegation of authority; rather, it is an integrated cognitive–behavioral, structural, and relational process shaped by complex interactions between psychological capacities, social dynamics, and neurocognitive mechanisms. The accelerating transformation of work environments—including digitalization, distributed decision-making, and neuro-informed management—has heightened the need for models that consider how cognition, learning, organizational context, and social interaction jointly influence empowerment

outcomes. Such transformations resonate with emerging scholarship on cognitive security, which emphasizes the multifaceted vulnerabilities and strengths of the human mind in dynamic organizational environments [1]. Empowerment, therefore, should be understood not only as a managerial practice but also as an evolving cognitive system embedded within institutional, social, and neurobiological structures.

In recent years, public and private organizations have begun to conceptualize empowerment through the lens of neurocognition, acknowledging the role of neural processes underlying learning, decision-making, motivation, and adaptation. This movement parallels the rise of cognitive automation and human–machine augmentation, which challenge traditional views of human intelligence and competence in organizational settings. As Takasugi argues, advances in cognitive automation require organizations to rethink how human intelligence can be scaffolded, extended, and protected in environments that increasingly integrate automated cognitive agents [2]. These developments necessitate empowerment frameworks that incorporate neuroscientific insights—particularly those related to cognitive flexibility, learning energy, and the brain's adaptive responses to stress, novelty, and environmental demands. Within such a landscape, the integration of empowerment and cognitive science becomes essential for understanding how individuals acquire, process, and operationalize empowerment-related capacities.

Parallel to these developments, research in leadership and organizational behavior highlights the centrality of cognitive, affective, and social processes in shaping empowered work behavior. Shared leadership research suggests that when responsibility and influence are distributed across organizational members, deviant innovation behaviors—creative behaviors that intentionally challenge norms—can arise as adaptive responses to dynamic challenges [3]. These behaviors require cognitive flexibility, psychological safety, and a sense of autonomy. Studies on cognitive communities further support this view, showing that institutions themselves operate as dynamic cognitive systems shaped by the collective mental models of their members [4]. Empowerment, therefore, is an emergent phenomenon produced through interactions between individual cognition, institutional structure, and socio-cognitive practices.

Contemporary empirical research has likewise linked empowerment to enhanced learning capacity and experiential skill acquisition. Kolb-based experiential learning approaches show that individuals attain deeper and more transferable knowledge when learning is situated in real-world, feedback-driven environments [5]. This is particularly important for public-sector managers whose work requires rapid situational interpretation, informed decision-making, and adaptive problem-solving. The scaffolding theory of maturation and cognition further reveals that motor–cognitive interactions shape a broad range of functional capacities across the lifespan, emphasizing that empowerment processes must consider the developmental, neurobiological, and experiential backgrounds of employees [6]. These insights highlight the necessity of adopting models of empowerment that are flexible, developmentally informed, and grounded in whole-brain functioning.

Cognitive flexibility, one of the cornerstone attributes of empowered employees, is also closely tied to the brain's energy distribution and structural configuration. The SENECA model, for instance, demonstrates that cognitive flexibility in aging adults is mediated by allostatic load and network energy allocation within the brain [7]. These findings underline that empowerment initiatives—particularly those centered on learning and cognitive development—must account for neurobiological variability among employees. Similarly, research on neural oscillations and white matter integrity has shown that disruptions in neural connectivity influence cognitive computational profiles, impacting an individual's ability to sustain attention, regulate emotion, and maintain goal-directed behaviors [8]. When contextualized within organizational

empowerment, such results underscore that cognitive empowerment cannot be fully understood without considering the integrity and adaptability of underlying neural structures.

Empowerment is equally influenced by structural conditions within organizations. Strategic clarity, for example, shapes mental models and organizational image, influencing how employees perceive their roles and levels of autonomy [9]. Structural empowerment models indicate that personal initiative, job satisfaction, and psychological empowerment are deeply intertwined with the clarity of expectations, accessibility of resources, and perceived meaningfulness of work [10]. These connections reveal that empowerment must be embedded within organizational design rather than treated as an isolated managerial technique. Talent management and structural empowerment have also been shown to shape innovative work behavior, thereby illustrating the synergistic relationship between formal structures, psychological states, and behavioral outcomes [11]. Public-sector organizations that fail to consider these interactions may experience stagnation, disengagement, and misalignment between capability and responsibility.

Recent developments in human–AI interaction and service environments show that empowerment now extends into the digital domain. Empathy-driven human–AI relationships can improve frontline service experiences, demonstrating the role of emotional cognition and trust-building in environments where both humans and AI systems participate in decision-making [12]. Similarly, neuro-social cognitive remediation programmes demonstrate that cognitive strengthening and social adaptation can be cultivated through structured interventions that integrate both neural and social components [13]. These insights contribute to a broader understanding of empowerment as an adaptive, multi-layered process influenced not only by organizational structures but also by the evolving technological ecology within which employees operate.

The psychological and social dimensions of empowerment have also received renewed attention in community-level research. Psycho-social empowerment models, such as those developed for vulnerable populations, highlight the importance of addressing social integration, emotional support, and participatory processes as core components of empowerment [14]. Social interaction likewise remains a central determinant of empowerment outcomes among older adults, who often experience barriers related to time availability, perceived need, and socio-emotional support [15, 16]. These perspectives reinforce the idea that empowerment is not merely a cognitive phenomenon but also a social one constructed through interactions that generate meaning, emotional connection, and collective identity.

New directions in neuro-semantics and decision science further deepen understanding of how the brain constructs meaning, evaluates options, and processes empowerment stimuli. Wah's model on neuro-semantics demonstrates how perception, meaning, and decision-making are tightly coupled, suggesting that empowerment interventions must align with the brain's natural meaning-making processes to be effective [17]. This aligns with research showing that delegating responsibility can increase role-breadth self-efficacy and constructive deviance among employees [18]. In public-sector contexts, where hierarchical rigidity often limits cognitive autonomy, these findings emphasize the necessity of designing empowerment interventions that stimulate cognitive engagement and broaden perceived behavioral options.

Simultaneously, organizational resilience and institutional cognition frameworks reveal how organizations, like neural systems, adapt to uncertainty, temporal dynamics, and fluctuating environmental pressures. O'Mara conceptualizes institutions as "time-travelling cognitive communities," which dynamically integrate past experiences, present conditions, and future aspirations [4]. Empowerment operates within this temporal-cognitive space, influencing how employees

interpret institutional narratives, respond to change, and internalize organizational values. Such a perspective reinforces the need for empowerment models that consider both micro-level neurocognitive factors and macro-level institutional dynamics.

Public-sector human resource systems face unique challenges, including bureaucratic constraints, limited autonomy, rigid hierarchical structures, and diverse stakeholder expectations. These issues demand empowerment frameworks that can adapt to multi-layered complexities. The integration of neurocognitive principles, structural empowerment models, and interactive relational dynamics offers a promising avenue for understanding and enhancing employee performance in such environments. Furthermore, research from neuro-oncology showing the long-term cognitive side effects of neurological impairments highlights the fragility of cognitive resources and the importance of designing empowerment initiatives that respect the cognitive load and well-being of employees [19]. The interplay between cognitive health, organizational design, leadership behavior, and social interaction is thus central to developing comprehensive empowerment strategies.

Taken together, the existing body of research demonstrates that empowerment is an inherently interdisciplinary construct shaped by cognitive security, experiential learning, neurocognitive functioning, institutional cognition, structural clarity, social interaction, and psychological needs. However, a major gap remains: public-sector organizations have yet to integrate these diverse strands of evidence into a single, comprehensive empowerment model informed by neurocognitive principles. Addressing this gap requires a holistic, interdisciplinary, and neuroscientifically grounded examination of empowerment strategies across cognitive, structural, and interactive domains.

The aim of this study is to develop a neurocognitively informed model that integrates cognitive, structural, and interactive approaches to human resource empowerment in governmental organizations.

Methodology

This study adopted a qualitative research design grounded in phenomenology to explore the neurocognitive underpinnings of cognitive, structural, and interactive approaches to human resource empowerment within governmental organizations. The research was framed as a descriptive-exploratory inquiry, aiming to formulate a conceptual model that integrates phenomenological insights with neuroscientific evidence to better understand empowerment strategies in public-sector human resource systems. The phenomenological dimension of the research was essential for identifying the lived experiences, perceptual structures, and meaning-making processes of senior human resource managers as they encounter and implement empowerment practices. This interpretive paradigm aligns with the philosophical foundations of Edmund Husserl, emphasizing the examination of phenomena as they are experienced, their intentional structures, and the essential meanings derived from real-life contexts. In line with this paradigm, the study sought to uncover the subjective and cognitive processes shaping managerial interpretations of empowerment strategies, thereby creating an analytical bridge between phenomenological inquiry and contemporary neuroscientific knowledge.

Participants consisted of senior human resource managers working in governmental organizations across several provinces of Iran. These individuals were selected because they possessed substantial experience in designing, developing, and implementing capacity-building and empowerment initiatives. A purposive sampling strategy was employed during the phenomenological phase to ensure representation from managers with varying demographic, educational, and experiential backgrounds. Efforts were made to include participants of different age groups, academic levels, and genders, all of whom had practical involvement in human resource empowerment programs. Sampling continued until data saturation was

reached, which occurred after nine participants, as no new conceptual themes emerged beyond this point. For the second phase of the research, which used an implication-driven analytical approach, theoretical sampling was applied to extract, refine, and interpret conceptual implications from neuroscientific literature relevant to empowerment processes.

The primary tool for data collection in the phenomenological section of the study consisted of semi-structured and in-depth interviews. These interviews allowed a flexible yet systematic exploration of managerial experiences, cognitive patterns, and interpretations related to empowerment approaches. Interview questions were designed as open-ended prompts to encourage participants to describe their lived experiences with minimal interference. Questions such as “What experiences have you had regarding the empowerment process?” and “Which factors or domains influence your perception of empowerment?” guided the conversations, enabling the researcher to capture detailed narratives involving thoughts, emotions, challenges, and meaning structures associated with empowerment practices. The researcher facilitated the interviews through a soft, indirect, and non-leading style to avoid imposing predetermined interpretations on participant responses. All interviews were audio-recorded, transcribed verbatim, and subsequently returned to participants for member checking, ensuring that extracted statements, codes, and interpretations accurately reflected their intended meaning. This validation procedure strengthened the credibility and trustworthiness of the qualitative findings.

In addition to interviews, the study employed document review to support the implication-analysis phase. This included examining neuroscientific research related to cognitive functions, decision-making processes, emotional regulation, neural plasticity, and social interaction dynamics. These documents served as secondary data for identifying cross-domain implications between neurocognitive mechanisms and empowerment strategies. The researcher reviewed empirical studies, theoretical models, neuroscientific frameworks, and conceptual papers to identify meaningful relationships and inferential pathways that could illuminate how neurocognitive processes influence or enhance human resource empowerment. This dual-tool data collection strategy enabled the integration of grounded experiential data from managers with theoretical and empirical findings from neuroscience.

Data analysis relied primarily on phenomenological methods aimed at identifying the essence of participants' lived experiences. Interview transcripts were subjected to a systematic coding procedure rooted in phenomenological reduction, where significant statements related to empowerment were first extracted, then condensed into meaningful units. The researcher engaged in horizonalization—treating every statement with equal value before determining its significance—to prevent premature hierarchical organization of the data. Through iterative reading, reflection, and coding, clusters of meaning emerged and were grouped into thematic structures representing the core cognitive, structural, and interactive dimensions of empowerment as experienced by participants. These themes were then transformed into rich textual and structural descriptions that captured both what participants experienced and how they experienced it. The synthesis of these descriptions resulted in the articulation of the fundamental essence of empowerment phenomena in managerial contexts.

For the implication-research phase, the analysis followed a structured framework designed to identify and validate conceptual implications derived from neuroscientific knowledge. The researcher examined scientific documents for patterns, clues, and theoretical signals relevant to empowerment processes. Eleven analytic steps guided this procedure, including establishing compatibility of the study with implication methodology, defining the conceptual domain, sampling sources theoretically, extracting implication-based data, validating interpretations, mapping implications to the conceptual framework derived from phenomenological themes, and integrating the final set of validated implications into a cohesive

analytical model. This phase did not seek to establish causal relationships; rather, it highlighted how neuroscientific principles may inform, enrich, or reinterpret cognitive, structural, and interactive empowerment strategies. By synthesizing themes from interviews with neuroscientific insights, the analysis provided a multidimensional understanding of empowerment that incorporates experiential meaning structures and neurobiological explanatory mechanisms.

Findings and Results

The findings of this qualitative phenomenological study yielded three overarching categories that characterize the neurocognitive foundations of empowerment strategies in governmental human resource systems: the cognitive approach, the structural approach, and the interactive approach. Each approach comprised several themes derived from participants' lived experiences and expert insights, highlighting the cognitive processes, neural mechanisms, and organizational dynamics that shape empowerment outcomes. Through systematic coding and thematic reduction, the study identified how learning, decision-making, problem-solving, leadership development, and interpersonal engagement are rooted in both psychological and neurocognitive processes, and how empowerment interventions must be aligned accordingly.

Table 1

Integrated Categories and Themes Derived From Cognitive, Structural, and Interactive Approaches

Concepts	Category	Approach
In-service training can change employees' attitudes toward organizational issues; well-designed and needs-based training increases the likelihood of attitude change; experience shows training and learning are central drivers of attitude change	Attitude change	Cognitive approach
Skill-based training improves the speed of decision-making; speed of decision-making varies among employees but can be enhanced through training	Decision-making speed	Cognitive approach
Despite fast decisions, many employees lack accuracy; accuracy requires high logical and emotional intelligence and is linked to neural processes; empowerment can enhance decision accuracy	Decision-making accuracy	Cognitive approach
Empowerment must ultimately result in behavioral change; however, expected behavioral changes do not always occur	Individual behavioral change	Cognitive approach
Leadership capacity differs among individuals, but delegation can strengthen it; a major part of leadership is charisma, influenced by neural and psychological mechanisms	Leadership ability	Structural approach
Problem-solving is a complex cognitive process developed through role practice; delegation improves employees' ability to solve organizational problems	Organizational problem-solving ability	Structural approach
Anticipating and managing crises requires managers familiar with delegated authority; crisis management depends heavily on role-based mental training	Crisis-management ability	Structural approach
Accurate diagnosis and management of organizational conflicts depends on cognitive and diagnostic capacities during execution; gradual delegation enhances mental skills for conflict management	Conflict-resolution ability	Structural approach
Teamwork tendency is shaped by mental structures, personality, and past experiences; awareness of teamwork benefits improves mindset; psychological tensions influence preference for individual vs. group work	Teamwork tendency	Interactive approach
Some employees are naturally extroverted and seek communication; willingness to connect depends on psychological and cognitive structures	Interpersonal communication acceptance	Interactive approach
Group activities can mentally and emotionally prepare employees for participation; participation is enjoyable for many; individuals with high participation tendency often have higher emotional intelligence	Enjoyment of organizational participation	Interactive approach

The results demonstrate that the cognitive approach to empowerment is deeply rooted in neurocognitive processes that shape how employees learn, perceive, and interpret organizational realities. Participants repeatedly emphasized that changes in mental schemas—particularly attitude change—occur primarily through structured and well-designed educational programs. These findings suggest that cognitive empowerment is not merely a behavioral outcome but emerges from shifts in neural pathways related to learning, attention, and information processing. Managers highlighted that decision-making speed and accuracy depend on intertwined cognitive and emotional mechanisms, where processes such as neural efficiency, emotional regulation, and logical reasoning play crucial roles. The theme of individual behavioral change further revealed that empowerment initiatives sometimes fail when cognitive transformation does not translate into consistent behavioral patterns, indicating that deep-level cognitive restructuring is necessary for sustainable empowerment.

The findings related to the structural approach reveal that empowerment is equally shaped by organizational design and the neurocognitive mechanisms underlying authority, leadership, and problem-solving. Participants described leadership as partly a function of charisma and personality—both of which have neurological and psychological bases involving social cognition, emotional signaling, and interpersonal influence. Delegation emerged as a critical structural mechanism that activates and strengthens cognitive circuits related to responsibility, autonomy, and executive functioning. Themes such as organizational problem-solving, crisis management, and conflict resolution reflect the role of mental training, scenario-based learning, and cognitive preparedness. The data illustrate that structural empowerment succeeds when employees repeatedly engage in role-based scenarios that stimulate neural plasticity associated with judgment, situational awareness, and complex problem-solving. Thus, structural mechanisms of empowerment operate not only through authority distribution but also through cognitively stimulating environments.

The interactive approach highlights the role of social cognition, emotional intelligence, and interpersonal neurobiology in shaping empowerment outcomes. Participants described teamwork tendency as a phenomenon strongly influenced by personality traits, early experiences, and emotional memories, underscoring the brain's role in determining social preferences. Interpersonal communication emerged as a theme with clear neurocognitive underpinnings, as willingness to connect with others depends on psychological safety, dopamine-reward systems, and mental schemas shaped over time. Enjoyment of organizational participation further reflects how positive affect, emotional intelligence, and group-based neural synchrony contribute to collaborative empowerment. Employees who derive emotional satisfaction from participation tend to engage more deeply in organizational processes, forming stronger cognitive and emotional bonds with organizational goals. The findings collectively show that interactive empowerment strategies must consider neural mechanisms underlying social behavior, motivation, and emotional regulation to be fully effective.

Table 2

Neurocognitive Interpretation of Empowerment Approaches

Empowerment Approach	Neurocognitive Mechanisms	Resulting Outcomes
Cognitive Approach	Dopamine activation, myelination, hippocampal strengthening, prefrontal focus regulation	Improved attitude, faster and more accurate decision-making, enhanced behavioral regulation
Structural Approach	Autonomy-reward circuitry activation, dendritic growth, strengthened executive-function networks	Increased confidence, leadership emergence, better crisis and conflict management
Interactive Approach	Social-reward system activation, oxytocin release, prefrontal social-cognition development, neural synchrony	Higher teamwork tendency, stronger communication skills, greater enjoyment in participation

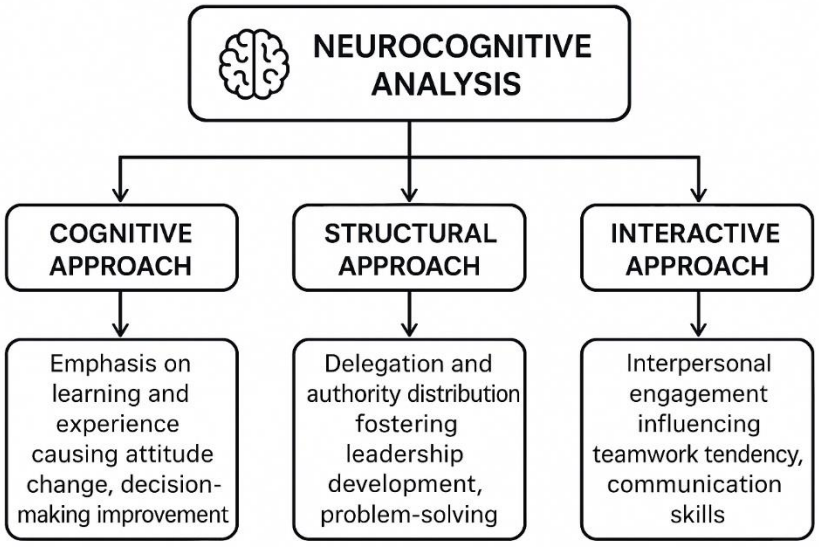
The cognitive approach to empowerment highlights the essential role of learning, experience, and knowledge acquisition in shaping key psychological and behavioral outcomes such as attitude change, decision-making speed and accuracy, and behavioral refinement. From a neurocognitive standpoint, learning experiences stimulate neural circuits responsible for attention, memory, and perception, strengthening them through dopaminergic activation and myelination processes. As individuals repeatedly engage in structured training and reflective practice, the brain's capacity for rapid information processing increases, enabling faster decision-making. Likewise, higher-order functions such as precision, logical appraisal, and emotional regulation become more efficient as prefrontal regions consolidate new neural pathways. This gradual strengthening of cognitive circuits supports the translation of conceptual understanding into behavioral consistency, explaining why deeply internalized learning experiences serve as catalysts for durable empowerment outcomes.

Within the structural approach, empowerment through delegation and distribution of authority demonstrates profound neurocognitive consequences. Granting autonomy enhances an individual's sense of control, which the brain interprets as a reward, activating neural systems associated with motivation, confidence, and emotional stability. Environments that provide opportunities for voluntary action stimulate dendritic growth, allowing neural networks to expand in complexity and adaptability. As employees encounter new responsibilities and decision-making scenarios, their neural circuits related to judgment, role anticipation, and problem-solving become more refined. Conversely, environments lacking autonomy suppress neural activation linked to executive function and may weaken cognitive circuits associated with independent problem resolution. Empowerment initiatives based on structured delegation therefore reshape neural pathways underlying leadership, crisis handling, and conflict management by repeatedly exercising and reinforcing them.

The interactive approach underscores the neurobiological foundations of social behavior, cooperation, and interpersonal connectivity. Human brains are biologically tuned for social engagement, and meaningful social interactions stimulate reward circuitry, emotional bonding mechanisms, and neural regions involved in empathy, communication, and group cohesion. Frequent participation in group activities strengthens prefrontal areas that support logical reasoning and social judgment while also increasing the release of neurochemicals associated with trust, affiliation, and emotional comfort. Employees who actively engage in organizational participation benefit from enhanced neural synchrony with peers, increased emotional intelligence, and greater resilience against cognitive and emotional stressors. As such, interpersonal dynamics within teamwork, communication, and participatory environments contribute not only to psychological well-being but also to the neurocognitive foundations required for collaborative empowerment.

Figure 1

Final Conceptual Model



Discussion and Conclusion

The findings of this study demonstrate that cognitive, structural, and interactive mechanisms of human resource empowerment each contain distinct neurocognitive foundations that shape the way employees learn, adapt, collaborate,

and perform within governmental organizations. Interpreting these findings through prior empirical and theoretical literature provides a deeper understanding of how empowerment develops as both a psychological and neurobiological process. At the cognitive level, the study revealed that managerial learning experiences strengthen attitude change, enhance decision-making speed and accuracy, and support individual behavioral transformation. These findings correspond with contemporary research on cognitive security, which argues that empowerment depends on the ability of individuals to protect, structure, and regulate their cognitive assets in dynamic environments [1]. The enhanced accuracy and behavioral stability observed in this study's participants further align with insights from research on neurological oscillation patterns and white matter integrity, which demonstrate that efficient information processing and emotional regulation are essential components of cognitive functioning [8]. Our findings reinforce that empowerment is not simply a managerial intervention but an outcome rooted in neuroplasticity, cognitive flexibility, and the structured reinforcement of neural pathways.

The study's emphasis on experiential learning as a catalyst for empowerment is also strongly reflected in existing empirical literature. The cognitive improvement observed through training and hands-on learning among participants aligns with experiential learning frameworks that emphasize iterative feedback loops, environmental stimulation, and real-world task immersion as core ingredients of cognitive development [5]. Moreover, this pattern echoes the Kolb-based models currently used in advanced artificial intelligence training, suggesting that experiential stimulation activates higher-order cognitive functions and supports the retention of complex behavioral scripts. Likewise, the observed importance of focus, emotional regulation, and reflective practice resonates with research on neuro-social cognitive remediation, demonstrating that structured cognitive reinforcement can substantially improve decision-making and executive function in applied settings [13]. The convergence between our findings and these studies highlights the relevance of neurocognitive mechanisms—such as myelination, dopaminergic activation, and hippocampal reinforcement—in strengthening cognitive empowerment among public-sector employees.

The structural approach findings similarly reveal strong parallels with contemporary research. Delegation of authority emerged as one of the most powerful structural mechanisms influencing empowerment, which supports previous work showing that shared leadership fosters constructive deviance, risk-taking, and creativity within organizational settings [3]. This resonates with scholarship showing that empowering leadership enhances role-breadth self-efficacy and the willingness to engage in behaviors beyond one's formal duties [18]. Structural clarity also proved crucial for shaping empowerment outcomes, echoing research suggesting that strategic clarity improves organizational image and strengthens employees' mental models regarding their responsibilities [9]. The capacity of delegation to enhance key competencies such as problem-solving, crisis management, and conflict resolution corresponds with talent-management studies demonstrating that structural empowerment significantly predicts innovative work behavior [11]. Collectively, these findings emphasize that empowerment does not emerge in isolation but is deeply influenced by organizational structures, reward systems, clarity mechanisms, and distributed authority.

Neuroscientific literature similarly strengthens the structural interpretation of empowerment. The study found that feelings of autonomy generate cognitive stimulation and neural reinforcement, echoing broader research showing that institutions function as dynamic cognitive communities whose functioning depends on the mental structures and decision-making patterns of their members [4]. This is reinforced by the SENECA model, which demonstrates that cognitive flexibility and network energy distribution are deeply influenced by environmental conditions such as autonomy, workload, and

responsibility [7]. As employees gain more responsibility, they activate and strengthen neural networks associated with executive control, situational analysis, and long-term planning. These findings are further supported by research on motor–cognitive interactions, which shows that the brain reorganizes its structural and functional networks in response to complex task demands and judgment-based activities [6]. Therefore, the evidence confirms that empowerment is tightly linked to neurocognitive engagement and the stimulation of executive-function circuits.

The interactive approach findings reveal the equally vital social and neurobiological foundations of empowerment. Participants reported that teamwork tendency, interpersonal communication, and enjoyment of organizational participation were strongly influenced by emotional intelligence, psychological safety, and previous social experiences. These insights are consistent with prior research showing that social interaction facilitates empowerment in both organizational and community contexts [15, 16]. Furthermore, the links identified between social connection and emotional reward align with studies demonstrating that social bonding and pro-social engagement generate neurochemical responses associated with trust, motivation, and psychological well-being [13]. Empathy-driven service models also support this finding, showing that emotional resonance between humans and artificial agents can enhance service experiences and increase organizational harmony [12]. Our findings strongly reinforce that social empowerment is fundamentally rooted in both affective and neural mechanisms that shape collective behavior and interpersonal functioning.

From a broader institutional perspective, the study's findings mirror theories conceptualizing institutions as cognitive ecosystems. The interplay between individual cognition, social interaction, and structural design mirrors frameworks that describe institutions as resilient, adaptive cognitive communities [4]. The study's emphasis on integrated cognitive–structural–interactive empowerment aligns with such holistic models, suggesting that organizational empowerment should be understood as a system-level phenomenon rather than an isolated managerial intervention. Similarly, the behavioral engagement observed among employees with broader role definitions and decision-making freedom supports research demonstrating that psychological empowerment mediates the relationship between structural empowerment and job satisfaction [10]. This convergence of evidence across multiple empirical and theoretical domains demonstrates that empowerment functions as a multilevel construct influenced by complex neural, psychological, social, and institutional mechanisms.

Furthermore, the study's findings about behavioral consistency and neurocognitive reinforcement echo research on long-term cognitive health, including findings related to pediatric neurocognitive conditions that underscore the fragility of cognitive resources and the need for sustained reinforcement to maintain cognitive performance [19]. This highlights that empowerment strategies must consider both cognitive load and the neurobiological constraints of employees. When contextualized within the broader literature—from cognitive automation [2] to neuro-semantic processing [17]—the results suggest that empowerment should be envisioned as a dynamic process requiring sustained cognitive investment, structural support, and interpersonal alignment.

Overall, the integration of this study's findings with existing scholarship reveals that empowerment is fundamentally neurocognitive, systemic, and interactional. Cognitive training strengthens neural pathways, structural delegation stimulates executive-function circuits, and social interaction fosters affective and interpersonal neural synchrony. Public-sector organizations stand to benefit significantly by adopting empowerment strategies that reflect these interdisciplinary insights.

This study was conducted using a qualitative phenomenological design, which, while effective for revealing deep experiential insights, inherently limits generalizability. The sample size was restricted to nine senior human resource managers from selected governmental organizations, meaning that the findings may not fully represent the experiences of employees across different administrative levels or institutional contexts. The reliance on narrative data also introduces the possibility of recall bias, subjective interpretation, and the influence of social desirability during interviews. Moreover, although the study integrates neuroscientific literature conceptually, it did not include physiological measurement or experimental techniques that could empirically verify neurocognitive mechanisms. These limitations suggest that while the findings provide meaningful theoretical insights, they should be interpreted with caution when extrapolated to broader organizational populations.

Future research should aim to incorporate mixed-method or neuro-empirical approaches, such as EEG, fMRI, or cognitive behavioral assessments, to directly measure the neural correlates of empowerment processes. Expanding the participant pool to include frontline employees, middle managers, and diverse organizational types would also enhance the generalizability of the model. Longitudinal research could explore how empowerment-related neural and behavioral changes evolve over time, particularly under varying structural and social conditions. Additionally, future studies might investigate how digital transformation, AI-based decision support, and remote working environments influence the neurocognitive processes associated with empowerment.

Public-sector organizations should design empowerment programs that integrate structured learning, delegated authority, and team-based collaboration. Training initiatives should emphasize experiential learning to strengthen cognitive pathways, while organizational structures should promote autonomy and strategic clarity to stimulate executive-function development. Managers should cultivate social environments that encourage emotional connection, trust, and open communication. Combining cognitive, structural, and relational strategies will enable organizations to create a more adaptive, motivated, and empowered workforce capable of meeting the complex demands of modern administrative systems.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. Written consent was obtained from all participants in the study.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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