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Lifelong Learning and Organizational Agility: A Forward-Looking Approach to Human Capital Development in the Age of Artificial Intelligence

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Abstract

The study aimed to identify the role of lifelong learning and organizational resilience in shaping the future of human capital in the era of artificial intelligence by examining the levels of lifelong learning, professional development and renewal, organizational resilience, and human capital, as well as analyzing the relationships among these variables. The study adopted a descriptive correlational-analytical approach. A questionnaire was administered to a convenience sample of 108 employees working in higher education institutions in Jordan. The results indicated statistically significant levels across the study dimensions. They also revealed a strong positive relationship between lifelong learning and organizational resilience, with a Pearson correlation coefficient of 0.705 and an explained variance of 49.7%. Furthermore, a strong positive relationship was found between organizational resilience and the future of human capital, with a Pearson correlation coefficient of 0.747 and an explained variance of 55.9%. These findings highlight the importance of integrating lifelong learning and organizational resilience into human capital development and enhancing its capacity to respond to the transformations driven by artificial intelligence applications. The study recommended strengthening lifelong learning programs, developing organizational policies that support resilience, and continuously investing in human capital development and reskilling in alignment with future requirements.

Keywords: Lifelong Learning, Organizational Resilience, Human Capital, Artificial Intelligence.

التعلّم مدى الحياة والرشاقة التنظيمية: مقاربة استشرافية لتنمية رأس المال البشري في عصر الذكاء الاصطناعي

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الملخص

ركزت هذه الدراسة على فهم الدور الذي يلعبه التعلم مدى الحياة والمرونة التنظيمية في تشكيل مستقبل رأس المال البشري في عصر الذكاء الاصطناعي، من خلال تحليل مستويات التعلم مدى الحياة، والتطوير والتجديد المهني، والمرونة التنظيمية، ومستويات رأس المال البشري، بالإضافة إلى دراسة طبيعة العلاقات بينها. اعتمدت الدراسة على المنهج الوصفي الارتباطي التحليلي، وتم تطبيق أداة الاستبانة على عينة تضم (108) من العاملين في مؤسسات التعليم العالي بالأردن، حيث تم اختيارهم بطريقة ميسرة. أظهرت النتائج وجود مستوى دال إحصائي في محاور الدراسة، كما بينت العلاقة القوية والإيجابية بين التعلم مدى الحياة والمرونة التنظيمية، حيث بلغ معامل ارتباط بيرسون (0.705)، في حين بلغت نسبة التباين المفسر (49.7%). كما أكدت النتائج وجود علاقة إيجابية قوية بين المرونة التنظيمية ومستقبل رأس المال البشري، إذ بلغ معامل الارتباط (0.747).وبلغت نسبة التباين المفسر (55.9%). وتشير هذه النتائج إلى أهمية تكامل التعلم المستمر والمرونة التنظيمية في دعم رأس المال البشري وتعزيز قدرته على الاستجابة للتحولات التي تفرضها تطبيقات الذكاء الاصطناعي. وأوصت الدراسة بتعزيز برامج التعلم مدى الحياة، وتطوير السياسات التنظيمية الداعمة للمرونة، والاستثمار المستمر في تنمية رأس المال البشري وإعادة تأهيله بما يتوافق مع متطلبات المستقبل.

الكلمات المفتاحية: التعلم مدى الحياة، المرونة التنظيمية، رأس المال البشري، الذكاء الاصطناعي.

Introduction

The world of work is undergoing rapid transformation driven by successive advancements in artificial intelligence (AI) technologies, reshaping the nature of jobs, skills, and performance patterns within organizations. Preserving human capital is no longer solely a matter of accumulated knowledge and experience; rather, it increasingly depends on individuals' capacity for continuous learning and their ability to adapt to professional and technological changes. In this context, lifelong learning has emerged as a strategic imperative that promotes knowledge renewal, capability development, and preparedness to meet future demands. At the organizational level, agility represents a core capability that enables organizations to absorb transformations and realign their human resources with changing environmental conditions. The integration of continuous learning and organizational agility is becoming increasingly critical as AI evolves from a mere technical tool into a pivotal factor influencing job design, talent management, and decision-making. Consequently, anticipating the future of human capital requires viewing individual capability development and organizational readiness as complementary pathways.

Accordingly, this study examines the relationship between lifelong learning and organizational agility from a forward-looking perspective, with the aim of elucidating their implications for the future of human capital in the age of artificial intelligence.

Problem Statement

The study addresses the widening gap between the rapid transformations in the nature of work and human capital requirements, on the one hand, and organizations' ability to reshape and develop their human capabilities in alignment with emerging and future trends, on the other. The professional value of knowledge and experience has become increasingly dependent on workers' ability to update their competencies, renew their skills, and transition between constantly evolving job roles. At the same time, organizations face the challenge of creating work environments capable of accommodating these changes, reallocating resources and tasks, and establishing development practices that extend beyond traditional training models.This situation highlights the need to understand how lifelong learning can be leveraged as a pathway for capability development and integrated with organizational agility as a framework for responding effectively to future transformations. There is also a need to identify the potential characteristics of human capital in a work environment in which the role of artificial intelligence continues to expand. This requires rethinking the skills and competencies needed to adapt to these changes, as well as the associated transformations in organizational practices and workforce development.

Thus, the study problem lies in elucidating the nature of the relationship between lifelong learning and organizational agility and their potential role in shaping the future of human capital in the age of artificial intelligence. Accordingly, the study's main research question can be formulated as follows:

What are the future characteristics of human capital in the age of artificial intelligence in light of the roles of lifelong learning and organizational agility?

Significance of the Study

Theoretical Significance

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1. This study contributes to enriching the scholarly literature on human capital by providing an integrated perspective that combines lifelong learning and organizational agility within a forward-looking framework, thereby extending the conceptual understanding of human capital development in the context of future work environments.
2. The study proposes a conceptual framework that illustrates the alignment between the development of key human capital attributes and the changing requirements of the work environment, thereby contributing to a broader understanding of the readiness of human capital to respond to the transformations shaping the future of work.

Practical Significance

1. The study contributes to the fields of management and education by adopting a forward-looking perspective to examine potential changes in skills, competencies, and professional roles, thereby opening new avenues for research on the future of human capital across diverse professional and educational contexts.
2. The study's findings may assist educational and administrative leaders in designing policies and practices that are better aligned with future human capital requirements, particularly in the areas of capacity building, career development, reskilling, and workforce development.
3. The study provides a foundation that organizations can utilize to enhance talent management and workforce planning practices by drawing on indicators related to lifelong learning and organizational agility in responding to technological and professional transformations.
4. The study's findings may support policymakers and decision-makers in developing future-oriented strategies for human capital development by aligning education and training policies with labor market requirements and anticipated changes in the nature of jobs, skills, and competencies**.**

Study Questions:

The study seeks to answer the following questions:

1. What are the expected changes in the characteristics of human capital and professional competency requirements in the era of artificial intelligence?
2. What role does lifelong learning play in developing the capabilities and competencies required for the future of human capital?
3. What are the organizational agility requirements for managing human capital amid the transformations associated with artificial intelligence?
4. What is the nature of the relationship between lifelong learning, organizational agility, and the future of human capital in the era of artificial intelligence?

Operational Definitions:

Lifelong Learning: Lifelong learning is defined as a continuous and organized process through which individuals develop their knowledge, skills, and professional capabilities through ongoing learning, training, and the acquisition of experience. This process enhances individuals' ability to keep pace with changing work requirements and adapt to developments associated with artificial intelligence. In this study, lifelong learning is operationally measured by the scores obtained by the study participants on items designed to assess continuous learning practices, competency development, and professional growth.

Organizational Agility: Organizational agility is defined as an organization's ability to respond rapidly and effectively to internal and external changes by adapting and reconfiguring its processes, resources, and work practices. This capability enables organizations to respond effectively to technological and professional developments while maintaining performance

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continuity and achieving organizational goals. In this study, organizational agility is operationally measured through the study participants' responses to items reflecting organizational adaptability, speed of response, resource reallocation, and the ability to make appropriate decisions in the face of change.

Human Capital: Human capital is defined as the aggregate of knowledge, skills, experiences, capabilities, and competencies possessed by individuals that contribute to value creation, enhanced performance, and the achievement of organizational goals. Human capital is also viewed as a dynamic resource that can be developed, reskilled, and adapted in response to emerging changes in the work environment. In this study, human capital is operationally measured through indicators related to the level of competencies, knowledge, skills, and experience, as well as individuals' capacity to learn, adapt, and respond effectively to emerging professional requirements.

Study Limitations

Spatial Scope: The study was limited to higher education institutions in the Hashemite Kingdom of Jordan.

Temporal Scope: The study was conducted during the 2025/2026 academic year.

Human Scope: The study was limited to a convenience sample of 108 employees working in higher education institutions in Jordan. The sample included academic and administrative leaders, faculty members, and administrative staff with relevant experience in the work environment, professional development, and organizational transformations.

Lifelong learning takes various forms that extend beyond the boundaries of formal education and traditional training, evolving into a continuous practice associated with different stages of an individual's professional career. This concept encompasses a set of interrelated dimensions, foremost among which is self-directed learning, which enables individuals to identify their own learning needs and pursue their professional development independently. It also includes professional learning, which involves acquiring the knowledge, skills, and expertise necessary to improve job performance. In addition, experiential learning is derived from the situations, experiences, and challenges that individual encounter in the workplace.

Theoretical Literature

Furthermore, lifelong learning encompasses digital learning, which facilitates access to diverse sources of knowledge and the use of electronic platforms and digital tools, as well as collaborative learning, which is based on the exchange of knowledge and experiences among colleagues and professional peers.

These dimensions are reflected in practical activities such as participating in training programs, attending specialized conferences and seminars, completing online courses, reading scholarly and professional literature, exchanging experiences with colleagues, and engaging in professional learning communities. Such practices provide individuals with continuous opportunities to update their knowledge, expand their expertise, and develop their professional capabilities, thereby integrating learning into everyday professional practice rather than restricting it to specific training periods.

Consequently, the effectiveness of lifelong learning depends not merely on the volume or frequency of educational activities, but also on the extent to which these activities align with individuals' professional needs and their ability to translate acquired knowledge into meaningful and tangible improvements in professional practice**.** (Abu Al-Haija, 2024).

Lifelong Learning and the Development of Professional Skills and Competencies

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Lifelong learning represents a fundamental pathway for developing professional capital, enabling individuals to continuously update their knowledge, skills, and capabilities in alignment with the changing demands of their jobs. Skills that were once sufficient for performing specific tasks may require further development in response to the emergence of new work methods, technologies, and changes in job responsibilities. Consequently, continuous learning expands the foundation of professional competencies by integrating theoretical knowledge with practical application while strengthening essential skills such as problem-solving, critical thinking, communication, teamwork, and decision-making.

The impact of lifelong learning extends beyond the acquisition of new skills; it also involves adapting and reshaping existing competencies to better meet emerging professional requirements. It enables individuals to identify strengths and weaknesses in their performance, recognize areas requiring improvement, and select appropriate learning and training approaches. This process enhances individuals' capacity to assume diverse responsibilities, transition between professional tasks and roles, and draw upon previous experiences to address new demands.

Within organizational contexts, investment in continuous learning contributes to developing a workforce characterized by a combination of knowledge, experience, and adaptable skills. These attributes can enhance the quality of performance and strengthen an organization's capacity to effectively utilize its human resources. Thus, the development of professional competencies has become an ongoing process that does not end with the attainment of an academic qualification or entry into employment; rather, it continues throughout an individual's career in response to evolving professional pathways and changing workplace requirements.

The Role of Continuous Learning in Adapting to Technological Shifts

Technological shifts have become a driving force in reshaping work methods and organizational processes, making the workforce's ability to adapt to new tools and applications a crucial factor for sustained performance. In this context, continuous learning offers a practical means for individuals to understand, engage with, and leverage emerging technologies to accomplish tasks, rather than viewing them merely as tools detached from professional practice. The role of continuous learning is particularly evident when introducing digital systems or AI-driven applications; workers must develop the ability to use these tools, understand their capabilities and limitations, evaluate their outputs, and manage the associated data and information. Furthermore, continuous learning helps bridge the gap between the pace of technological advancement and the speed at which necessary skills are acquired, by providing ongoing opportunities for experimentation, updating knowledge, and retraining.

Technological adaptation entails more than simply mastering a new application; it involves restructuring one's mindset and work methods to align with a changing technological environment. Workers committed to continuous learning are better prepared to modify their performance approaches, acquire unfamiliar skills, and navigate shifts in tasks and responsibilities. At the organizational level, fostering a culture of continuous learning facilitates digital transformation, as the success of new technologies depends largely on the workforce's readiness to adopt and integrate them into daily operations.

Thus, continuous learning serves as a mechanism linking technological advancement with the capacity of human capital to respond to it; It does not merely address existing skill gaps; rather, it supports the workforce's readiness to handle future technologies that may reshape the nature of jobs and the content of work (Al-Otaibi, 2025).

Flexibility in Decision-Making and Resource Management

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Flexibility in decision-making and resource management constitutes a key component of organizational agility, reflecting an organization's ability to respond effectively to changing circumstances without being excessively constrained by rigid administrative procedures and established patterns of operation. Decision-making flexibility is demonstrated through rapid responses to new information and emerging developments, as well as by granting different management levels an appropriate degree of autonomy to make decisions within their respective areas of responsibility while maintaining clarity regarding roles, responsibilities, and organizational objectives. It also involves viewing decisions as processes that can be reviewed and adjusted as circumstances evolve, rather than adhering rigidly to predetermined courses of action that may no longer be appropriate.

With regard to resource management, organizations need to be capable of reallocating human, financial, and technological resources in accordance with changing priorities and emerging needs. Certain situations may require increasing resources allocated to a particular area, redirecting them toward more critical activities, or utilizing available resources in innovative ways. This capability is particularly important in rapidly changing environments, where effective resource allocation is closely linked to management's ability to continuously assess changing conditions and establish appropriate priorities.

Consequently, flexibility in decision-making and resource management does not imply the absence of organizational controls. Rather, it reflects the existence of a structured administrative framework that provides sufficient flexibility to adjust, redirect, and respond when necessary. This approach can help reduce response delays, optimize the utilization of available resources and capabilities, and strengthen the organization's ability to maintain operational continuity amid changing conditions.

Organizational Agility and Adaptation to Technological Change

Technological advancements have brought about fundamental changes in service delivery methods, operational management, information flows, and internal organizational communication. Consequently, organizational agility has become a crucial factor in an organization's ability to absorb these transformations and integrate them into its work systems in ways that are aligned with its goals and capabilities.

Organizations with adaptable structures and processes are better positioned to transition from traditional to digital systems without causing significant disruptions to workflow. Adapting to technological change involves reviewing procedures and processes, redesigning tasks, modernizing communication channels, improving service delivery methods, and utilizing data to support administrative operations. It also requires monitoring technological developments and assessing their suitability to the organization's needs rather than adopting technology merely for the sake of innovation.

Thus, organizational agility is linked to an organization's capacity to absorb and effectively integrate technology into its operations and adapt it to the nature of its work, rather than simply possessing technological tools. With the growing adoption of artificial intelligence, this adaptation has become increasingly complex, as the use of intelligent applications can influence task allocation, information flows, control mechanisms, and the nature of certain job roles.

Therefore, organizations need to periodically review their structures and processes to identify areas in which AI-based applications can add value, while simultaneously addressing the organizational, ethical, and security considerations associated with their use. In this way, organizational agility serves as a mechanism for managing technological transformation in a gradual, systematic, and context-sensitive manner rather than treating it as an isolated change detached from the broader organizational system**.** (Manea et al., 2015).

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Requirements for Building Agile Organizations

Building an agile organization requires a set of managerial and organizational elements that enable it to respond effectively to changing circumstances. One of the most important requirements is an adaptable organizational structure that ensures administrative layers and complex procedures do not hinder the organization's ability to respond rapidly to emerging developments. The organization also requires clear and efficient communication channels that facilitate the flow of information across different organizational levels, thereby supporting timely and well-informed decision-making.

Another key requirement is disciplined decentralization, which involves granting organizational units and individuals an appropriate level of authority commensurate with their responsibilities while maintaining effective mechanisms for monitoring and accountability. Furthermore, reliable information systems are essential for enabling management to monitor, analyze, and respond to changes effectively. This should be supported by policies and procedures that allow for the timely reallocation of resources and responsibilities when circumstances require.

An agile organization also requires leadership that supports initiative, innovation, and adaptability, encouraging the continuous review of existing practices rather than assuming their continued suitability. A culture characterized by openness to change, mutual trust, and collaboration among organizational units can further contribute to transforming agility from a temporary administrative response into a sustained organizational capability.

Consequently, building an agile organization does not depend on a single element but rather on the integration of organizational structure, communication efficiency, procedural flexibility, information systems, appropriate distribution of authority, resource management, and leadership support. This integration enhances the organization's capacity to reprioritize activities, respond effectively to technological and professional changes, and maintain a clear direction toward achieving its strategic objectives.

The Importance of Human Capital in Achieving Organizational Performance

Human capital is a fundamental element in an organization's ability to transform its resources and capabilities into tangible outcomes. The quality of organizational performance is closely linked to the knowledge, experience, skills, and capabilities that enable employees to perform their tasks and assume their responsibilities effectively. The value of human capital is not determined solely by the number of employees or their formal qualifications; rather, it is reflected in their ability to utilize their knowledge and experience to solve problems, improve work methods, and contribute to the achievement of organizational objectives.

Human capital influences organizational performance through several mechanisms, most notably by improving the quality of outputs, increasing the efficiency of resource utilization, fostering innovation, reducing errors, and strengthening problem-solving capabilities. Furthermore, the accumulation of experience within an organization contributes to the development of institutional knowledge that can be used to improve processes, support knowledge transfer, and sustain organizational performance. Consequently, investment in human capital should be viewed not merely as a personnel-related cost, but as a strategic resource capable of generating sustainable value for the organization.

The importance of human capital is particularly pronounced in institutions that rely heavily on knowledge and expertise to deliver services, where employee performance is directly linked to the quality of outputs and overall organizational effectiveness. Therefore, retaining, developing, and continuously reskilling human capital are critical factors in enhancing organizational

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efficiency and achieving performance levels aligned with the organization's strategic objectives. (Al-Sakali, 2025).

Human Capital Development and Reskilling

Sustaining the value of human capital requires the adoption of continuous approaches to its development and reskilling, particularly when the nature of jobs changes or when existing knowledge and skills become less aligned with emerging work requirements. This development process extends beyond the acquisition of new information; it involves strengthening and reshaping professional capabilities to enable individuals to transition from established patterns of performance to more complex roles and responsibilities.

Reskilling involves identifying gaps between existing capabilities and the requirements of new or evolving roles, followed by the design and implementation of appropriate programs to address those gaps. Such initiatives may include specialized training, reskilling programs, job rotation, practice-based learning, and opportunities to participate in new projects and tasks. These approaches contribute to maintaining the professional value of the workforce and reducing the risk of knowledge and skill obsolescence resulting from changes in the work environment.

Human capital development is also closely linked to an organization's ability to identify the latent potential within its workforce and direct it toward areas that can generate greater organizational value. Effective reskilling is not limited to addressing existing competency gaps; it also involves developing capabilities that are likely to become important in the future. From this perspective, human capital development constitutes a strategic process that enhances workforce readiness, supports adaptability, and sustains employees' capacity to perform evolving roles in changing work environments.

Human Capital and Evolving Labor Market Requirements

The labor market is undergoing continuous changes in the nature of jobs and the demand for specific competencies, driven by economic and technological developments, as well as shifts in business models. These changes have created a growing need for human resources possessing diverse and complementary capabilities, moving beyond reliance on narrow specialization or knowledge associated with a single task. Accordingly, individuals increasingly need to demonstrate adaptability, including the ability to transition between tasks and navigate professional environments in which requirements are constantly evolving.

Contemporary labor market demands encompass a range of interconnected capabilities, including digital literacy, information analysis, critical thinking, problem-solving, communication, and the ability to work effectively in multidisciplinary teams, alongside proficiency in emerging technologies. With the expanding use of artificial intelligence, job roles are increasingly characterized by a redistribution of tasks between humans and intelligent systems. This development further highlights the importance of capabilities that rely on human judgment, contextual understanding, creativity, and professional interaction.

Consequently, the alignment of human capital with labor market requirements increasingly depends on the ability to keep pace with changing competency demands rather than merely possessing academic qualifications or prior experience. This requires educational institutions and employers to monitor emerging trends in jobs and competencies and to align educational and professional development outcomes with both current and anticipated labor market needs. Thus, human capital is becoming increasingly connected to the capacity of organizations and economies to respond to these transformations and generate professional value that is aligned with the evolving nature of work (Al-Otaibi, 2026).

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The Role of Continuous Learning in Enhancing Organizational Resilience

Continuous learning contributes to organizational resilience by strengthening an organization's capacity to respond to emerging developments and understand their implications for operations and work processes. Organizations that provide employees with regular opportunities to acquire knowledge and exchange experiences are better positioned to absorb changes without relying solely on predetermined solutions or established procedures. Furthermore, the widespread adoption of learning practices within an organization facilitates knowledge sharing, expands the available base of expertise, and supports decision-making in situations that require timely responses.

The impact of continuous learning extends beyond the individual level, becoming an important component of an organization's capacity to renew its methods of work and adapt to changing circumstances. As new experiences accumulate and are shared across organizational units, a collective capacity emerges to review existing practices, identify areas for improvement, and develop alternatives that are better suited to emerging conditions. Thus, continuous learning functions as a mechanism for strengthening organizational resilience by enabling organizations to move beyond reactive responses toward greater preparedness for future challenges.

Integration Between Individual and Organizational Capabilities

Organizational effectiveness cannot be achieved through individual capabilities alone, nor can institutional systems and procedures function effectively when employees lack the ability to utilize them appropriately. Integration occurs when the knowledge, skills, and experiences possessed by individuals are transformed into shared practices that support the performance of organizational units and contribute to the achievement of organizational objectives.

This process involves the exchange of experiences, knowledge sharing, collaborative work, and the integration of diverse areas of expertise to address organizational issues and tasks. Organizations play a vital role in transforming individual capabilities into collective value by providing structures, systems, and practices that enable these capabilities to be effectively utilized. An employee may possess advanced knowledge in a particular field, but its organizational value increases when appropriate channels exist for sharing that knowledge with colleagues or applying it to the improvement of procedures and processes.

Conversely, a supportive organizational environment provides individuals with opportunities to benefit from the knowledge and experience accumulated within the organization, thereby fostering a reciprocal relationship between individual development and organizational improvement. Thus, the integration of individual and organizational capabilities provides a foundation for building cohesive organizational capacity. It enables organizations to move beyond reliance on isolated competencies toward developing systems that effectively leverage diverse expertise and transform it into collective organizational value. (Duchek, 2020).

Organizational Learning and Agility in the Face of AI-Driven Transformations

Artificial intelligence (AI) is driving transformations that extend far beyond the mere introduction of new technological tools. Its adoption can modify workflows, redistribute tasks, and generate professional responsibilities that did not previously exist in their current forms. In this context, continuous learning and organizational agility provide complementary pathways for managing these transformations. The former relates to the workforce's ability to understand, adopt, and effectively utilize emerging technologies, whereas the latter concerns the organization's capacity to adapt its structures, processes, and work practices in response to technological change.

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Successfully integrating AI requires providing employees with opportunities to understand the applications used within the organization, evaluate their outputs, recognize their capabilities and limitations, and develop appropriate practices related to data management, privacy, security, and professional accountability. At the same time, organizations need to review their procedures to identify tasks that can be supported or enhanced by AI-based technologies and those that require continued human involvement and professional judgment.

The interaction between learning and organizational agility becomes particularly evident in an organization's ability to learn from the transformation process itself. The outcomes of technology implementation can provide valuable insights that support the refinement of policies and procedures, the optimization of role allocation, and the adjustment of practices that do not produce the expected outcomes. Thus, managing AI integration can be viewed as an ongoing organizational process based on experimentation, evaluation, learning, and continuous improvement rather than as a one-time technological decision (Choudhary, 2021).

Future Human Capital Requirements

Future human capital requirements are increasingly shifting toward a model that combines specialized knowledge with capabilities that enable individuals to navigate complex and rapidly changing professional environments. Technical knowledge alone may be insufficient for many jobs; instead, increasing importance is likely to be placed on the ability to analyze information, manage data, understand digital applications, think critically, solve problems, communicate effectively, and work in environments where human capabilities interact with intelligent technologies.

Future human capital will also require a high degree of learning agility and professional adaptability, given that tasks and roles are likely to evolve more rapidly than in the past. This includes the capacity to acquire new areas of specialization, transition between different fields of work, and apply existing knowledge and experience in new contexts. Furthermore, human-centered capabilities that are less readily replicated by automated systems, such as creativity, professional judgment, negotiation, relationship building, and an understanding of social and organizational contexts, are likely to remain important.

From an organizational perspective, future-oriented human capital development requires organizations to view human capital as a renewable and developable resource rather than as a static stock of qualifications and experience. Consequently, organizations need systems capable of identifying emerging competency gaps, anticipating roles likely to be transformed by technological developments, and directing investments in human capital toward areas of increasing strategic value. Ultimately, the future of human capital depends on the capacity of both individuals and organizations to continuously develop professional value in alignment with anticipated changes in the world of work.

Previous Studies

Choudhary et al. (2021), in their study titled "Navigating Employability Perceptions through Lifelong Learning: An Empirical Study," examined lifelong learning, human capital, and employability. The study aimed to investigate the role of continuous learning in enhancing individuals' professional value and supporting their employability. The findings revealed a positive relationship between lifelong learning and employability, indicating that continuous learning contributes to enhancing the value of human capital.

Duchek (2020), in the study titled "Organizational Resilience: A Capability-Based Conceptualization," examined organizational resilience from a capability-based perspective, with particular attention to anticipation, response, and adaptation. The study conceptualized

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organizational resilience as an integrated organizational capability that enables organizations to navigate changing circumstances. The theoretical findings indicated that resilience comprises three interconnected stages: anticipation, coping with disruptive events, and adaptation, which collectively support an organization's ability to respond to change.

Aman-Ullah et al. (2022), in their study titled "Human Capital and Organizational Performance: A Study on the Role of Innovative Leadership," examined human capital in terms of knowledge, skills, and capabilities, as well as organizational performance and innovative leadership. The study sought to examine the relationship between human capital components and organizational performance and to explore the role of innovative leadership in this relationship. The findings demonstrated positive relationships between human capital capabilities, knowledge, skills, and organizational performance, with innovative leadership contributing to strengthening some of these relationships.

Ionescu et al. (2015), in their study titled "Interdependence Between Human Capital and Organizational Performance in Higher Education Institutions," examined human capital, training, competencies, experience, creativity, innovation, and organizational performance. The study investigated the relationship between human capital and the performance of higher education institutions. The findings emphasized the importance of employees' knowledge, competencies, experience, and capacity for creativity and innovation in supporting institutional performance and strengthening the ability of higher education institutions to adapt to changing circumstances.

Methodology and Procedures

Study Methodology:

The study adopted a descriptive-correlational-analytical approach, which was considered appropriate to the nature and objectives of the study. This approach was used to identify the levels of lifelong learning, professional development and renewal, organizational agility, organizational readiness for artificial intelligence, and human capital, as well as to examine the relationships among these variables in the context of artificial intelligence.

Study Sample:

The study sample consisted of 108 participants selected using convenience sampling. The participants were drawn from higher education institutions in Jordan and included academic and administrative leaders, faculty members, and administrative staff with relevant experience in the work environment, professional development, and organizational transformations.

Study Instrument:

1. A questionnaire was used to collect the study data. The questionnaire consisted of five main dimensions:

2. Lifelong Learning: Measures the continuity of learning, professional development, and the acquisition and renewal of knowledge and skills.
3. Professional Development and Renewal: Measures competency development, reskilling, and readiness to respond to changing work requirements.
4. Organizational Agility: Measures organizational adaptability, responsiveness, and the flexibility of procedures and processes in responding to changes.
5. Organizational Readiness for Artificial Intelligence: Measures the organization's capacity to prepare its work environment and human resources to adopt and effectively engage with artificial intelligence applications.

Human Capital: Measures knowledge, skills, experience, competencies, adaptability, and the capacity to create value.

Psychometric Properties of the Measurement Tool

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Validity was assessed using two methods:

1. Expert Validity

To establish the content validity of the research instrument, the initial version of the questionnaire was presented to a panel of five experts with relevant academic and professional expertise. The experts were asked to evaluate the clarity and accuracy of the linguistic formulation, the appropriateness of the items, the relevance of each item to its respective dimension, the comprehensiveness of the questionnaire, and the suitability of the response options for subsequent statistical analysis.

The expert review also aimed to identify potential methodological or design issues and determine whether any items required deletion, modification, or addition. Some experts recommended revising certain items because of complex or unclear wording, while others suggested modifying items that were considered less appropriate or insufficiently relevant to their respective dimensions. The experts also recommended diversifying the items and maintaining an appropriate balance in the number of items across the indicators to facilitate subsequent statistical analysis. In addition, several experts expressed positive evaluations of the study objectives and the overall alignment between the objectives, dimensions, and questionnaire items. Based on the experts' recommendations and observations, and in light of an overall agreement rate of 85%, the questionnaire was revised and refined. The resulting final version was then administered to the study sample.

2. Construct Validity (Internal Consistency)

To assess construct validity and internal consistency, Pearson correlation coefficients were calculated between each questionnaire item and its corresponding dimension, as well as between each dimension and the overall questionnaire score. The results are presented in the following table.

Correlation coefficients between each domain and the total score.

Key Themes	Level of significance	Correlation coefficient
Theme 1: Lifelong Learning	**0.01	0.752
Theme 2: Professional Development and	**0.01	0.830
Theme 3: Organizational	**0.01	0.870
Theme 4: Human Capital	**0.01	0.669

Reliability

Reliability was assessed using two methods: the test–retest method and Cronbach's alpha coefficient.

First Method: Test–Retest Reliability

The questionnaire was administered to a pilot sample and then re-administered to the same participants after a 15-day interval. The results are presented in Table (2). The Pearson correlation coefficient between the scores obtained from the first and second administrations of the questionnaire was 0.83, indicating a high level of test–retest reliability and demonstrating good temporal stability of the measurement instrument.

Table (2): Correlation coefficient between the two administrations for each dimension of the instrument.

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Key Themes	Correlation coefficient
Theme 1: Lifelong Learning	0.860
Theme 2: Professional Development and	0.74
Theme 3: Organizational Flexibility	0.85
Theme 4: Human Capital	0.91

Cronbach's alpha reliability coefficient was calculated for the questionnaire as a whole, yielding a value of 0.87. The coefficient was also calculated for each dimension separately, and the results are presented in Table (3), which reports the Cronbach's alpha coefficients for the study dimensions. The results indicate that the reliability coefficients ranged from moderate to high, demonstrating an acceptable to high level of internal consistency across the study dimensions. Overall, the Cronbach's alpha coefficient of 0.87 indicates a high level of reliability for the questionnaire as a whole.

Table (3): Cronbach's alpha coefficient for each dimension of the instrument.

Key Themes	Cronbach's alpha coefficient
Theme 1: Lifelong Learning	0.850
Theme 2: Professional Development and	0.77
Theme 3: Organizational Flexibility	0.83
Theme 4: Human Capital	0.78

Study Results:

To answer the first question—"What are the expected shifts in human capital characteristics and professional competency requirements in the era of artificial intelligence?"—arithmetic means, standard deviations, and percentages regarding the study sample's responses were used.

Table (4) presents the analysis of the items within the "Lifelong Learning" dimension.

The First Section	Arithmetic Mean	Standard Deviation	Relative Weight (%)	T-value	p-value	Level of Agreement
Lifelong learning	3.762	0.562	75.24	21.224	0.000	Agreement

Table (4) reveals the following: The overall arithmetic mean across all items in the lifelong learning dimension was 3.762, with a relative weight of 75.24%, a t-test value of 21.224, and a p-value of less than 0.001. These results indicate that the mean response score for the lifelong learning dimension was statistically significantly higher than the neutral value of 3 at the 0.05 significance level, reflecting a positive level of agreement among the study participants regarding this dimension.

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This finding reflects the participants' awareness of the importance of continuous professional development in the context of the transformations associated with artificial intelligence applications and their impact on the nature of tasks and job roles. It also suggests a growing need to continuously update knowledge and capabilities in alignment with technological advancements, thereby enhancing individuals' readiness to navigate an increasingly dynamic and rapidly changing work environment.

To address the research question concerning the role of lifelong learning in developing the capabilities and competencies required for the future of human capital, the study employed arithmetic means, standard deviations, and relative response weights based on the participants' responses. The results are presented in the following tables.

Table (5) presents the analysis of the items in the professional development and renewal dimension.

The Second	Arithmetic Mean	Standard Deviation	Relative Weight (%)	T-value	p-value	Level of Agreement
Overall mean for the professional development and renewal dimension	3.825	0.622	76.49	18.26	0.000	Agree

Interpretation of Table (5): Table (5) reveals the following: The overall arithmetic mean across all items in the professional development and renewal dimension was 3.80, with a relative weight of 74.49%, a t-test value of 18.26, and a p-value of less than 0.001. These results indicate that the mean response score for the professional development and renewal dimension was statistically significantly higher than the neutral value of 3 at the 0.05 significance level, reflecting a positive level of agreement among the study participants regarding this dimension. This finding reflects a clear tendency to view professional development and renewal as important for maintaining employees' professional value, particularly in light of the rapid evolution of job tasks and professional requirements. It also suggests that sustaining human capital is increasingly associated with individuals' ability to continuously update and develop their capabilities in alignment with rapid technological changes driven by artificial intelligence.

To address the research question concerning the organizational agility requirements for managing human capital amid transformations associated with artificial intelligence, the study employed arithmetic means, standard deviations, and relative response weights based on the responses of the study sample. The results are presented in the following tables.

Table (6) presents the analysis of the items within the organizational flexibility dimension.

the third	Arithmetic Mean	Standard Deviation	Relative Weight (%)	T-value	p-value	Level of Agreement

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Overall mean for the organizational resilience dimension	3.73	0.614	74.52	18.61	0.000	Agree

Interpretation of Table (6): Table (6) reveals the following: The overall arithmetic mean for the organizational agility dimension was 3.23, with a relative weight of 74.52%, a t-test value of 18.61, and a p-value of less than 0.001. These results indicate that the mean response score for the organizational agility dimension was statistically significantly higher than the neutral value of 3 at the 0.05 significance level, reflecting a positive level of agreement among the study participants regarding this dimension.

The findings indicate a notable level of organizational agility within the work environments of the organizations under study, suggesting that these organizations have a capacity to respond to organizational and technological changes and accommodate emerging developments. This may reflect the ability of organizational structures, procedures, and work practices to adapt to new requirements and implement necessary adjustments while maintaining operational continuity.

To address the research question concerning the nature of the relationship between lifelong learning, organizational agility, and the future of human capital in the age of artificial intelligence, the study employed arithmetic means, standard deviations, and relative response weights to describe the participants' responses. In addition, simple regression analysis was used to examine the relationships among the study variables. The results are presented in the following tables.

Table (7): Correlation coefficient and coefficient of determination regarding the relationship between lifelong learning and organizational flexibility in the age of artificial intelligence.

Correlation Coefficient R-squared	Coefficient of Determination Adjusted R-squared	Adjusted Coefficient of Determination Std. Error of the Estimate	Standard Error of the Estimate
0.705	0.497	0.493	0.44097

The preceding table reveals a strong positive relationship between lifelong learning and organizational agility in the era of artificial intelligence. The Pearson correlation coefficient was 0.705, while the coefficient of determination (R^2) was 0.497, indicating that 49.7% of the variance in organizational agility was statistically associated with lifelong learning. This finding indicates that higher levels of lifelong learning are associated with higher levels of organizational agility, highlighting the role of continuous learning in supporting an organization's capacity to respond to changes driven by artificial intelligence technologies.Furthermore, the proportion of explained variance indicates that lifelong learning is substantially associated with differences in organizational agility, while the remaining variance may be attributable to other individual, organizational, and contextual factors. However, this finding should be interpreted as an association rather than evidence of a causal relationship.

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Table (8): Correlation Coefficient and Coefficient of Determination regarding Organizational Flexibility and the Future of Human Capital in the Era of Artificial Intelligence

Correlation Coefficient R-squared	Coefficient of Determination Adjusted R-squared	Adjusted Coefficient of Determination Std. Error of the Estimate	Standard Error of the Estimate
0.747	0.55	0.59	0.44

The previous table reveals a strong positive relationship between organizational agility and the future of human capital, with a Pearson correlation coefficient of 0.747. The coefficient of determination (R^2) was 0.559, indicating that 55.9% of the variance in the future of human capital was statistically associated with organizational agility. This finding highlights the importance of an organization's capacity to adapt work roles, processes, and operational methods in response to the expanding use of artificial intelligence and the resulting changes in human capital requirements.

Furthermore, the proportion of explained variance indicates that organizational agility is substantially associated with variations in the future characteristics and requirements of human capital within a work environment characterized by continuous technological change. However, this finding should be interpreted as an association rather than evidence of a causal relationship.

Table (9) presents the analysis of items within the human capital dimension.

The fourth	Arithmetic Mean	Standard Deviation	Relative Weight (%)	T-value	p-value	Level of Agreement
Human Capital	3.326	0.614	74.22	20.61	0.000	Agree

Interpretation of Table (9): Table (9) reveals the following: The overall arithmetic mean across the human capital dimension was 3.30, with a relative weight of 74.22%, a t-test value of 20.61, and a p-value of 0.000. These results indicate that the mean score for the human capital dimension was statistically significantly higher than the neutral value of 3 at the 0.05 significance level. This indicates a positive level of agreement among the study participants regarding the human capital dimension.

The findings suggest that the study participants perceive human capital as characterized by notable levels of knowledge, skills, and capabilities that support effective individual performance in the workplace. Furthermore, the respondents' perceptions highlight the importance of these components in responding to changing work requirements and enhancing the value that employees contribute to their organizations.

Recommendations

1. Enhance lifelong learning programs to align with the requirements of artificial intelligence and evolving labor market demands.
2. Develop organizational policies that strengthen organizational agility and enable rapid and effective responses to technological changes.

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3. Sustain investment in human capital development and reskilling to prepare employees for emerging roles and future work requirements.
4. Integrate lifelong learning with organizational agility to develop human capital capable of adapting effectively to future technological and professional transformations.

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