The Impact of Technological, Individual, and Community Factors in Driving Organizational Social Intellectual Capital in Higher Education: A Path Analysis

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Abstract

Purpose: *This analysis seeks to understand how activity theory impacts organizational social capital in higher education and contributes to knowledge investment for integrating the knowledge economy and society within the higher education context.*

Design/Methodology/Approach*: The researcher tested the proposed research model from a survey of 154 teachers and experts randomly chosen from three national universities (Taibah University, King Saud University, and King AbdulAziz University). A related literature review analysis was conducted to explore the intersections between survey results and previous studies related to each factor of the structural model.*

A structural model analysis examined hypothetical relationships between variables. Standardized path coefficients were tested to determine whether the research's empirical evidence supported the hypotheses.

Results: *Hypotheses empirical verification confirmed the relationship between technological, individual, and community factors, promoting organizational social capital in higher education institutions.*

Analysis shows that the high Composite Reliability (CR) value measures 0.93, exceeding the value of 0.70, indicating all factors constantly measure the same construct. The study revealed that the Average Variance Extracted (AVE) value is equal to 0.58, exceeding the value of 0.5 for the structural model, confirming its validity based on convergent validity metrics.

Originality/Value: *This study is useful for analyzing and understanding technological, individual, and societal factors driving social and organizational capital in higher education*.

Keywords: Technological factors, individual factors, community factors, organizational social intellectual capital

Introduction

The primary objective of higher education is the merging of the knowledge economy and society in a constantly changing environment. This goal is driven by the recognition that higher education institutions play a vital part in shaping not only the economic landscape but also the social fabric of society. Incorporating the knowledge economy and society, organizations aim to prepare students for success in a constantly changing world, encourage innovation and business ownership, and contribute to establishing a more equitable and enduring society. This integration is essential to drive social and organizational capital and promote sustainable development in higher education. To attain this goal, it is critical to comprehend and explore the role of various factors in shaping and influencing the learning environment. This paper provides a complete overview of important factors, including social capital, technological, subjective, and societal factors, based on activity theory. Social capital refers to the resources rooted in social networks and relationships that facilitate collaboration and information exchange, such as trust and shared values. Technological factors involve the use of digital tools and platforms that enhance educational practices and knowledge sharing. Subjective factors include individual attitudes, beliefs, and perceptions that influence how people interact with technology and knowledge-sharing platforms in education. Societal factor practice encompasses social norms, values, and collaborative practices within the educational community that shape interactions and roles. Activity theory helps understand how these factors interact within a social and cultural context to impact higher education's social and organizational capital. Additionally, it emphasizes the critical importance of putting these factors into operation and outlines the study's aim: to examine the relationship between these factors and their influence on investment in the knowledge society within the realm of higher education.

Background

Strong bonds formed between people with similar backgrounds and interests that offer both material and emotional support and are more inward-looking and protective are referred to as social capital. The term "bonding social capital" describes networks with a high density of relationships among members, where the majority of the members, if not all of them, are connected because they know and frequently engage with one another (Chetty et al., 2022).

The underlying premise of the concept of social capital incorporates the value of mutual relations between actors in social settings established as networks of individuals in communities. In modern plural and highly individualised and diverse democracies, strong social networks resulting from shared views, attitudes, values, and practices are specifically intended to generalise reciprocity and greatly strengthen social collaboration and coherence (Tašner & Gaber, 2018).

Education is a major contributor to social capital, according to social science, since it imparts values, experiences, and abilities that promote social interaction (Fox et al., 2023, Apfeld et al., 2021). Thus, it has become of utmost importance to investigate factors affecting its development in educational environments. It is hypothesized that the development of social capital among college and university students is mediated by technological variables (Aun et al., 2023). That is to say, technological factors have pivotal roles in developing educational practices and facilitating knowledge sharing (Ahmad, Jameel & Raewf, 2021). To maximise educational achievements in a time of rapid technology improvement and growing emphasis on collaborative learning, it is

critical to comprehend efficient knowledge-sharing techniques (Zamiri & Esmaeili, 2024). The integration of digital tools within the framework of activity theory enables a more efficient and effective sharing of information and knowledge, thus contributing to the development of social and organizational capital in higher education.

Subjective factors are another critical aspect explored in this study. The concept of social capital incorporates several individual-level behavioural and attitudinal concerns (Apfeld et al., 2021). Subjective factors can positively or negatively affect knowledge sharing in higher education institutions and must be taken into account while discussing this issue (Du & Yang, 2020). Understanding subjective factors is vital to understanding the dynamics of knowledge sharing in the higher education landscape. Community factors and practices must be mentioned in this context. Researchers agree that higher educational institutions might be capable of embedding some institutional characteristics as resources of social capital (Pusztai, 2014). This may be developed if an institution develops any community-based practices like collaborative projects knowledge-sharing initiatives, and also community engagement that will foster social capital development (Schlossarek et al., 2024).

This study aims to investigate how technological, individual, and societal factors, grounded in activity theory, influence social and organizational capital in higher education. Specifically, this research examines how digital tools and platforms facilitate information exchange and knowledge sharing, how individual attitudes and perceptions affect engagement with these technologies, and how community practices and social norms shape interactions within educational institutions. By analysing these factors, the study seeks to provide concrete insights and practical recommendations to enhance the integration of the knowledge economy and society in higher education, ultimately fostering a more collaborative, innovative, and sustainable educational environment.

Statement of the Problem

The Kingdom of Saudi Arabia seeks to develop human and organizational assets as one of the strategic necessities to achieve the requirements of development plans. Saudi universities have begun to explore mechanisms for developing it to achieve sustainable levels of competitiveness and excellence in academic environments (Mohamed & Elsheikh, 2018). Despite the continuous development of human energies, the matter requires investigating the various factors that affect human capital within different organisational environments, especially at the level of educational institutions (Alfuhailah,2023). Intellectual capital in Saudi universities is considered a wealth that must be preserved, developed and its requirements must be met. This will help enhance the competitive advantage of teaching and learning processes and scientific research due to the fact that higher education institutions today compete for their knowledge, information and skills (Al-Anazi, 2023). In recent years, higher education institutions in Saudi Arabia have recognized the importance of intellectual capital in improving their organizational performance and fostering innovation. Organizational social intellectual capital, which includes shared knowledge, social networks, and relationships within an organization, is increasingly seen as a critical asset for fostering collaboration, improving teaching and learning processes, and supporting research initiatives. Despite its importance, the factors driving organizational social intellectual capital in the Saudi higher education context remain insufficiently explored. This research aims to fill this gap by investigating the impact of technological, individual, and community engagement on the development and enhancement of organizational social intellectual

capital within Saudi higher education institutions. Activity theory emphasizes the importance of transformational processes in achieving organizational goals. Organizational social intellectual capital develops through ongoing interactions among individuals (faculty, staff, and students) and technological tools within the broader institutional community. Collective actions, shared knowledge, and mutual participation in academic processes contribute to the growth and sustainability of organizational social intellectual capital.

Significance of the study

This study has significant value for various stakeholders in the Saudi higher education sector, including policymakers, education leaders, faculty, and administrators. The research findings can contribute to a deeper understanding of the key factors that influence social-organizational intellectual capital in Saudi universities, providing valuable insights into how technology, individual capabilities, and community engagement can collectively enhance intellectual capital within academic institutions. The study addresses the gap in the current literature by specifically focusing on its drivers in the context of Saudi higher education institutions. For university administrators and policymakers, the study provides insights into how to strategically leverage various factors—such as advances in educational technologies, professional development programs for faculty and staff, and fostering community partnerships—to build a strong foundation for social-organizational intellectual capital. By identifying the determinants of social and organizational intellectual capital, the study can help higher education institutions in Saudi Arabia create an environment that fosters knowledge exchange, improves academic performance, and enhances the institution's overall reputation. Saudi Arabia is investing heavily in transforming itself into a knowledge-based economy, as outlined in its Vision 2030. This study can contribute to achieving this vision by highlighting the role of intellectual capital in driving innovation and sustainable development within higher education.

Theoretical framework

Social capital in higher education institutions

Higher education institutions play incredible roles in providing students with a supportive environment that can positively encourage sharing knowledge, developing skills, and shaping personalities (Al-Husseini, 2021). These institutions enable young people to form new relationships with professors and students from a variety of social and economic backgrounds, which impacts their current and future experiences. This kind of support system is crucial for the development of social capital (Das & Lalitha, 2024). According to Claridge (2018), the social capital structural dimension deals with the social system characteristics and the varied forms of social organisations with their network relationships. The quality of these network relationships is attributed to the effect of the relational dimension. The normative dimension is used to reflect public morality, law acceptance, and organizational norms adherence (Wang et al., 2020). The normative dimension of social capital is affected by social interaction, supportive organizational efficacy, socio-demographic characteristics, and civic organization participation (Jicha et al., 2019). Worthy here to mention that the dynamic dimension is inherent in social ties and social capital usually embedded in the social structure to achieve its goals (Sulinska, 2018). Higher education institutions can utilize the dimensions of social capital to promote collaboration, knowledge sharing, and the academic community's overall growth.

Theory of Activity

The theory of activity, rooted in the psychoactive Soviet theory, includes a collection of social science theories and research. The theory originated from the work of Alexey Leontiev and Sergey Rubinstein and aims at a comprehensive understanding of human activities as complex social phenomena that go beyond cognitive models (Mironenko, 2013). It includes insights from Vladimir Bakhteriev and his followers on models of thought, as well as Ivan Pavlov's research on the physiology of higher nervous activity. Activity theory is an active and interventionist perspective, drawing on the contributions of Russian psychologists including Lev Vygotsky, Alexis Leontiev, Davydov, Ilyenkov, and, more recently, Finnish researchers such as Yrjö Engeström and Virkkunen, as well as the French researcher Yves Clot. Rooted in the historical context of the Russian Revolution, this theory adopts a dialectical approach, emphasizing the interdependence of theory and practice (Vezzosi, 2009).

From this perspective, one can conclude that activities are dynamic units where elements are constantly changing and evolving. Therefore, every activity has a developmental path. Activity theory is applied analytically; the unit of analysis under its purview is the systemic whole of an activity system rather than its separate entities as in other theories (Uden & Vecchio, 2018). The theory illustrates the role of various factors such as environment, personal history, culture, industry, motivation, and the complexities of real-life situations. The unit of analysis in this theory is the concept of human activity, which is oriented towards collective and cultural aspects or systems of activity. These systems include elements such as purpose, tools (markings and equipment), laws, society, and division of labour. Tensions and contradictions within these elements generate stimuli for activity within the framework of activity theory (Nardi, 2008). Activity theory provides a holistic approach to understanding and analysing phenomena, employing interactions, integrated language, and integrated descriptions for developing methods and drawing conclusions. It considers specific activities as meaningful interactions between topics and objectives facilitated by the tools. These tools serve as methods that reveal the visual mental processes that manifest themselves in the psychological and physical structures. There are three generations of activity theory (Batiibwe, 2019). The first generation, influenced by Vygotsky's work, emphasizes the role of mediation in activity (Vygotsky, 1985).

The second generation, inspired by Leontiev's contributions, focuses on group activism, where actions are individual but embedded in a societal context. Leontiev's work presents three levels of activity: object-oriented activity, action driven by individual or collective goals, and the process oriented towards the conditions of perception, performed by individuals or machines. The third generation of activity theory is rooted in historical and cultural views. It examines object-oriented activity systems and media, where artefacts serve as a basic unit of analysis. This generation makes it possible to analyse the contradictions within and between systems of activity, leading to change and development. It also facilitates the identification of near-future-oriented development areas within business systems. Furthermore, the third generation of activity theory promotes the analysis of extended learning cycles and employs formative interventions such as the Change Lab as a central methodological resource (University of Helsinki, 2023). Activity theory gives the researcher both a methodological structure and, at the same time, the tools for practising it. In addition,

activity theory allows the researcher to account for tension, contradictions, and differences in motives that may occur within any given context (Uden & Vecchio, 2018). Figure 1 illustrates three levels of activity theory: technological level, individual level, and community level.

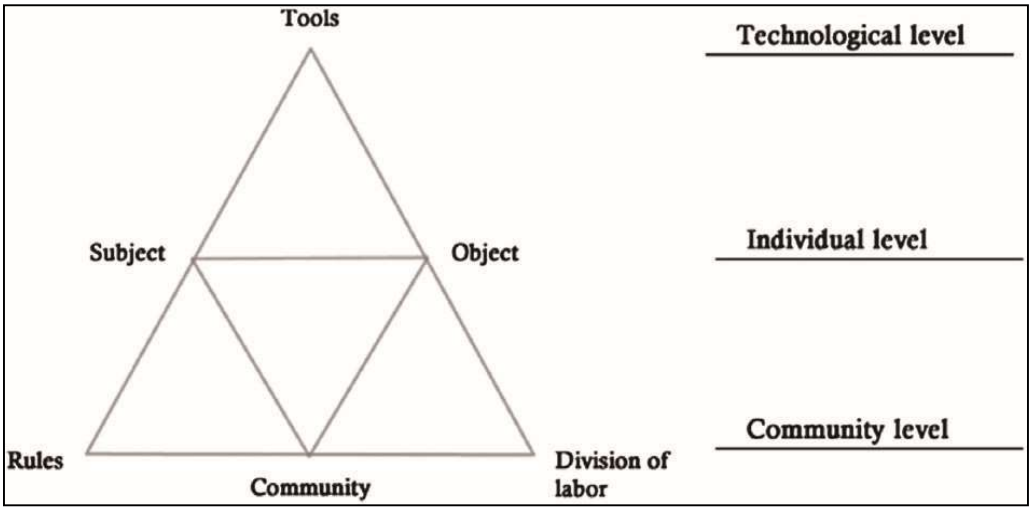

Figure 1. Levels of factors affecting social and organizational intellectual capital in activity theory

The individual, the actor, is the focus of the activity and its system. This actor can be an individual, for instance, a professor, or a group such as students. The mediating artefacts that help in the attainment of the outcome are referred to as the tools. The outcome is the object. Tools can be physical or psychological. They reflect anything utilized in the transformation process. The community is made up of people who share the subject's interest and connection with the same object. To accomplish the goal of an activity system, rules and the division of labour specify how participants are expected to behave and who is expected to do a certain action. Every action is contextualized in a particular context, for example, teaching is contextualized within the context of a university's activity system which also is encompassed by the country's activity system. All these embedded systems provide and develop the cultural life of the university or any other setting (Uden & Vecchio, 2018).

The elements of Engestrom's activity model define a system (activity and context) in which each element performs a specific mediating function between the other two. For example, the relation between "community" and "object" is mediated by the "division of labour" that defines the person from the "community" who can perform the tasks to achieve the "objective". In addition, the inclusion of the subject, object, and context in a single construct implies that ways of thinking and identities are not properties of individuals and organizations but inherently social and cultural historical phenomena associated with activity, and human action is necessarily action-in-context. It is important to note that, in the context of the socio-technical system, the "community" and the "rules" of Engestrom's activity model are the carriers of the influences of the social context on the agents' "subject", whereas the "tools" and the "division of labour" influence the ways of thinking (Adamides, 2023).

Hypotheses Testing

The technological level in the activity theory consists of tools, instruments, or concepts used by the system. The artifacts that individuals use to engage with the item are called tools, or means. These could include software and hardware, digital learning management systems, digital platforms, digital devices, etc. (Sikalima, 2021). Aldaremi (2022) confirms the need to use technology as a tool to manage the activity theory's transformation process and adapt it based on the activities and the theory's governing element.

- **H1:** Statistically there is a significant difference in the influence of technological factors of the activity theory on driving intellectual social capital in HE institutions.

According to activity theory, the individual is the subject who is acting in a situation with others. Activity theory aims to clarify the mental, cognitive, structural, and relational processes that occur when members of an organisation act in order to accomplish objectives (Institute for Social Capital, 2024). At the individual level within educational contexts, students' perceptions of the tools affordances can be the focus point to help them achieve superior performance (Baguma et al., 2019). The individual level of activity theory consists of two main components

i. Object orientation refers to the goal of the activity system. It encompasses the objective reality with natural and cultural characteristics.
ii. Subjects represent the participants involved in actions within the activity system. It focuses on the cognitive processes and mental aspects of individuals (Nardi, 2008).

- **H2:** Statistically there is a significant difference in the influence of the individual factors of the activity theory on driving intellectual social capital in HE institutions.

The community level is concerned with the social presence/sense of community and community rules. The factors given include: the sense of enjoyment students derive from social interactions and informal learning context (Baguma et al., 2019). The community level of activity theory comprises two main components:

i. Division of labour refers to the hierarchical structure of the activity system and the division of activities among participants.
ii. Laws encompass the customs, guidelines, and laws that regulate activities within the system (Engeström, 2001).

- **H3:** There is a statistically significant variance in the influence of the community factors of the activity theory on driving intellectual social capital in HE institutions.

The Role of Activity Theory in Enhancing Organizational Intellectual Capital in Higher Education

Numerous studies in the existing literature have investigated the factors associated with activity theory and organizational intellectual capital within the higher education sector. According to Evans and colleagues (2023), the success of university-industry collaboration in driving digital transformation hinges on the engagement and relationship amongst individual academics and industry practitioners, as they act as partners in a trusted relationship. This means that it is important for both parties to work together closely and communicate effectively.

To become a significant driver of growth, especially in higher education institutions, it is necessary to make a long-term and consistent effort. It is crucial to urgently promote domestic innovation. Additional variables, such as the implementation and marketing of technological innovation, could be explored in future studies (Bekhet & Latif, 2018). One significant factor highlighted is the utilization of social networking techniques within universities. The utilization of social networking platforms has been studied by researchers to examine how it can aid in communication, knowledge sharing, and collaboration among students, faculty, and staff, thereby contributing to the intellectual capital of the organization (Li et al., 2019).

The enhancement of technical skills among higher education personnel has also been a topic of interest. Scholars and experts have explored the significance of providing employees with the essential technological skills to efficiently employ digital tools and resources in both their teaching and administrative responsibilities (Tokarčíková et al., 2020). The literature underscores the importance of utilizing technology to offer information resources in higher education environments. Experts have investigated how incorporating technology, like learning management systems, digital libraries, and open educational resources, can enhance the availability of information, facilitate self-guided learning, and boost the collection of intellectual assets within an institution (Mkadmi & Bsir; Khan, 2019).

Examination of Individual Factors in Activity Theory and Organizational Intellectual Capital

Numerous studies have concentrated on examining individual factors associated with activity theory and organizational intellectual capital. One crucial factor that has been emphasized is the subjective attributes of individuals. Scholars have investigated how personal characteristics, such as drive, confidence, and persistence affect individuals' involvement in activities and their role in contributing to organizational intellectual capital (Kubicek et al., 2022; Nardi, 2008). Scholars have considered another aspect, which is the skill of setting goals with precision. They have analysed how individuals with unambiguous and well-defined objectives are more inclined to focus their efforts on activities that contribute to the progress and accumulation of intellectual capital (Mansour & Kapil, 2016). The significance of individuals having a precise understanding of measurable and evaluable performance indicators has been emphasized in the literature (Wang et al., 2019; Engeström, 2001; Nardi, 2008).

Further, scholars have emphasized the importance of individuals' self-skills development. They have explored the impact of individuals' abilities to manage, regulate, and develop themselves through their participation in activities that boost intellectual capital. By improving these self-skills, individuals can adjust to evolving work situations, learn new competencies and knowledge, and add value to their organization's intellectual capital (Wang et al., 2020; Nardi, 2008). .

The Role of Community Factors in Enhancing Organizational Intellectual Capital through Communities of Practice

Building and stimulating communities of practice within organizations has been identified as a crucial community factor. Research suggests that the accumulation and development of intellectual capital can be greatly enhanced through establishing (including fostering and maintenance) within communities of practice, wherein

professionals with similar interests collaborate and exchange knowledge (Wenger-Trayner & Wenger-Trayner, 2015). The literature does well to underscore the importance of embedding principles and culture that foster cooperative and collaborative work. Companies found to prioritize these practices build an atmosphere that encourages knowledge sharing, collective problem-solving, and cross-functional collaboration (Ahmed et al., 2016).

Universities are entirely reliant on their intellectual resources because they are the hub for knowledge creation (ALI, ZIN & Bin ISMAIL, 2023). Universities play a crucial role in providing both material and moral support to individuals and communities involved in activities related to intellectual capital development. This support includes resources, infrastructure, funding, and mentorship, which enable individuals and communities to prosper, collaborate, and create intellectual capital that benefits both the organization and society as a whole (Indiran et al., 2023). Ahmed et al. (2019) identified various mechanisms to strengthen communities of practice and develop social capital in elementary schools. These mechanisms included community-related factors represented by the Ministry of Education, faculties of education, and community institutions. Furthermore, mechanisms associated with the directorates of education focused on encouraging school workers' participation in communities of practice and providing training courses to develop the necessary leadership skills.

Organizational Intellectual Social Capital: Human, Relational, and Structural Factors

In the post-industrial economy, intellectual capital (IC) in the form of human, structural or relational capital is becoming a crucial factor for an organizational long-term performance, as it constitutes a competitive advantage from the resource-based theory perspective (Chatterji & Kiran, 2022; lbertini & Berger-Remy, 2019). The term "human capital" describes people's inherent capacity for production. It is the sum of the information, education, abilities, competencies, and other qualities that people or groups of people possess influencing their earning potential and ability to produce goods, services, or concepts in marketplaces. Human capital generates value in three ways: first, by improving the use of existing growth prospects; second, by generating new growth prospects; and third, by lowering the volatility related to the organizational growth rate (Sisodia, Jadiyappa & Joseph, 2021).

Encouraging ongoing learning, providing training opportunities, and facilitating knowledge sharing among employees can enable organizations to foster innovation and enhance their intellectual capital growth. The communal knowledge and skills of the employees can be leveraged to achieve these goals (Mohamed, 2015). Nations should focus on social and intellectual capital. High human development countries should continue to cultivate strategic alliances, safeguard intellectual property, and preserve or raise the level of trust in their nation, while low human development countries should strengthen human capital, such as the school enrolment rate, with early entrepreneurial training, and increase research and development investments (Mongrut & Berggrun, 2024). Additionally, raising the quality of research and publications, community service projects, learning, and services all contribute to the university's stellar standing (Hidayah, 2021).

Relational capital is the body of knowledge that makes an organization more valuable (Peces & Trillo, 2023). It is categorically divided into both internal and

external. The internal social capital of a firm is simply social assets that are created by the stakeholders, it enables the formation of trust within the firm. However, the external social capital is viewed as a construction that is necessary for the support of appropriate interaction with the surroundings that integrates the essential components such as a framework for potential client identification, channels of sales, research & development activities, clients, company name and credibility, and alliances (Szudrowicz, 2020).

Enhancing the university's quality is significantly impacted by university relational capital, which is gauged by metrics of academic collaboration and network development. The university's administration has to possess the capacity to form scholarly partnerships with other academic institutions. Cooperation might take the shape of guest lecturers, student exchanges, and research collaboration. Additionally, university administration must engage with government and business entities to place graduates who are hired or offer internships, as these initiatives have a big influence on academic achievement (Hidayah et al., 2021).

Since a lack of appropriate structures and procedures hinders an organization's ability to achieve peak performance even when personnel possess extraordinary abilities, structural capital is described as the mechanisms that allow individuals to function at their best (Chukwuazom, 2022). Structural capital is a critical component of intellectual capital. It is essential from the viewpoint that intellectual capital's real value and its reflections on profitability can be made possible by measuring it (Jardón & Silva, 2020). The allocation of structural capital to serve innovation and the creation of new processes have a direct impact on innovation. The innovation that improves an organization’s performance raises structural capital (Hama & Cavusoglu, 2023).

Altogether, the literature suggests that organizational intellectual social capital is ultimately influenced by three contributing factors (yet not exclusively): human capital, relational capital, and structural capital (Ali et al., 2021; Zhang & Phromphitakkul, 2021; Jardón & Silva, 2021). In summary, the existing literature has examined various factors related to activity theory and organizational intellectual capital in the setting of higher education institutions. These factors encompass individual characteristics, such as motivation and goal setting, as well as community factors, including building communities of practice, knowledge sharing, and adherence to ethical and legal principles. Lastly, integrating technology, developing technical skills, and providing information resources have been identified as important factors in enhancing intellectual capital within organizations. Future research can continue to explore these factors and their interplay to further understand and promote organizational intellectual capital.

Table 1: Activity theory and intellectual social capital factors generally addressed in the literature review

Principal factor	Sub Factor Code	Sub Factor	Studies supporting each variable of the conceptual model	Number of studies
Technological Factors (TF)	TF1	Digital transformation in universities	Engeström, 2001; Vezzosi, 2009; Evans et al., 2023; Bekhet & Latif, 2018; Barhoumi et al., 2021; Uzzi & Lancaster, 2003; Tokarčíková et al., 2020; Khan, 2019	8
	TF2	The use of technology in the development of the university’s scientific infrastructure		
	TF3	The use of technology in the development of the		

		educational process		
	TF4	Using social networking techniques within the university		
	TF5	Technical skills development for HE staff		
	TF6	Use of technology in providing information resources		
Individual Factors (IF)	IF1	Subjective characteristics of individuals	Engeström, 2001; Nardi, 2008; Kubicek et al., 2022; Mansour & Kapil, 2016; Wang et al., 2019; Wang et al., 2020	6
	IF2	Ability to set goals precisely		
	IF3	Accurate understanding of measurable and evaluable performance indicators		
	IF4	Developing individuals' self-skills		
Community Factors (CF)	CF1	Building and stimulating communities of practice	Engeström, 2001; Ahmed et al., 2019; Ahmed et al., 2016; Wenger-Trayner & Wenger-Trayner, 2015; Indiran et al., 2023	7
	CF2	Consolidating the principles and culture of cooperative and collaborative work and knowledge sharing.		
	CF3	Respect for general principles, social values, and ethics		
	CF4	Respect for laws and regulations		
	CF5	The material and moral support provided by the university		
Organizational Intellectual Social Capital	HC	Human Capital (Knowledge, expertise, and skills belonging to its individual	Zhang & Phromphitakkul, 2021; Khoshnaw & Karadas, 2024; Koka, & Pathak, 2006; Jardón & Silva (2021); Sisodia, Jadiyappa & Joseph, 2021; Zhang & Phromphitakkul, 2021;	11
	RC	Relational capital (Maintains a long-term, mutually beneficial relationship with its supplier)		
	SC	Structural Capital (Patented an innovative technology (i.e., intellectual property) or maximized efficiency in decision-making and processes through organizational structure)		
Total number of supporting each factor of the conceptual model				**32**

Structural equation modeling

Factors classified in Table 1 can be grouped into four broad categories to form the theoretical model of the study. Technological factors (TF) encompass the following:

- Digital transformation in higher education institutions (TF1) involves the overall transition to integrate digital technologies into university operations and infrastructure.

- The utilization of technology in building the university's scientific infrastructure (TF2) entails implementing advanced technologies to enhance research capabilities and scientific development.
- The use of technology in the educational process (TF3) involves leveraging digital tools and platforms to improve teaching and learning methods.
- Incorporating social networking techniques within the university (TF4) entails utilizing social media and networking tools to facilitate communication and collaboration among students and staff.
- Developing technical skills for higher education staff (TF5) focuses on providing training and development opportunities to enhance their technical skills.
- Lastly, the use of technology in providing information resources (TF6) aims to improve access to and management of information resources through digital technologies.

Individual factors (IF) can be considered as follows: subjective characteristics of individuals (IF1), which include personal attitudes, beliefs, and perceptions that influence behaviour and performance; ability to set goals precisely (IF2), which is the capacity to establish clear, achievable objectives; accurate understanding of measurable and evaluable performance indicators (IF3), which is the ability to comprehend and utilize performance metrics effectively; and developing individuals' self-skills (IF4), which enhances personal skills such as self-management, motivation, and resilience.

Community factors (CF) can be considered as follows: building and stimulating communities of practice (CF1), which involves creating and nurturing groups focused on shared learning and professional development; consolidating the principles and culture of cooperative and collaborative work and knowledge sharing (CF2), which promotes a culture of teamwork and open information exchange; respect for general principles, social values, and ethics (CF3), which upholds fundamental ethical standards and societal values; respect for laws and regulations (CF4), which adheres to legal and institutional rules and policies; and the material and moral support provided by the university (CF5), which offers both tangible resources and moral encouragement to support community initiatives.

Organizational Intellectual Social Capital (OISC) can be considered as follows: human capital (HC), which is the knowledge, expertise, and skills owned by persons within the organization; relational capital (RC), which is the value derived from maintaining long-term, mutually beneficial relationships with external partners and suppliers; and structural capital (SC), which includes the organizational processes and structures, such as intellectual property, that enhance efficiency and decision-making.

The proposed conceptual model of the relationship between technological, individual, and community factors of activity theory and the Organizational Intellectual Social Capital (OISC) in HE institutions is shown in Figure 2.

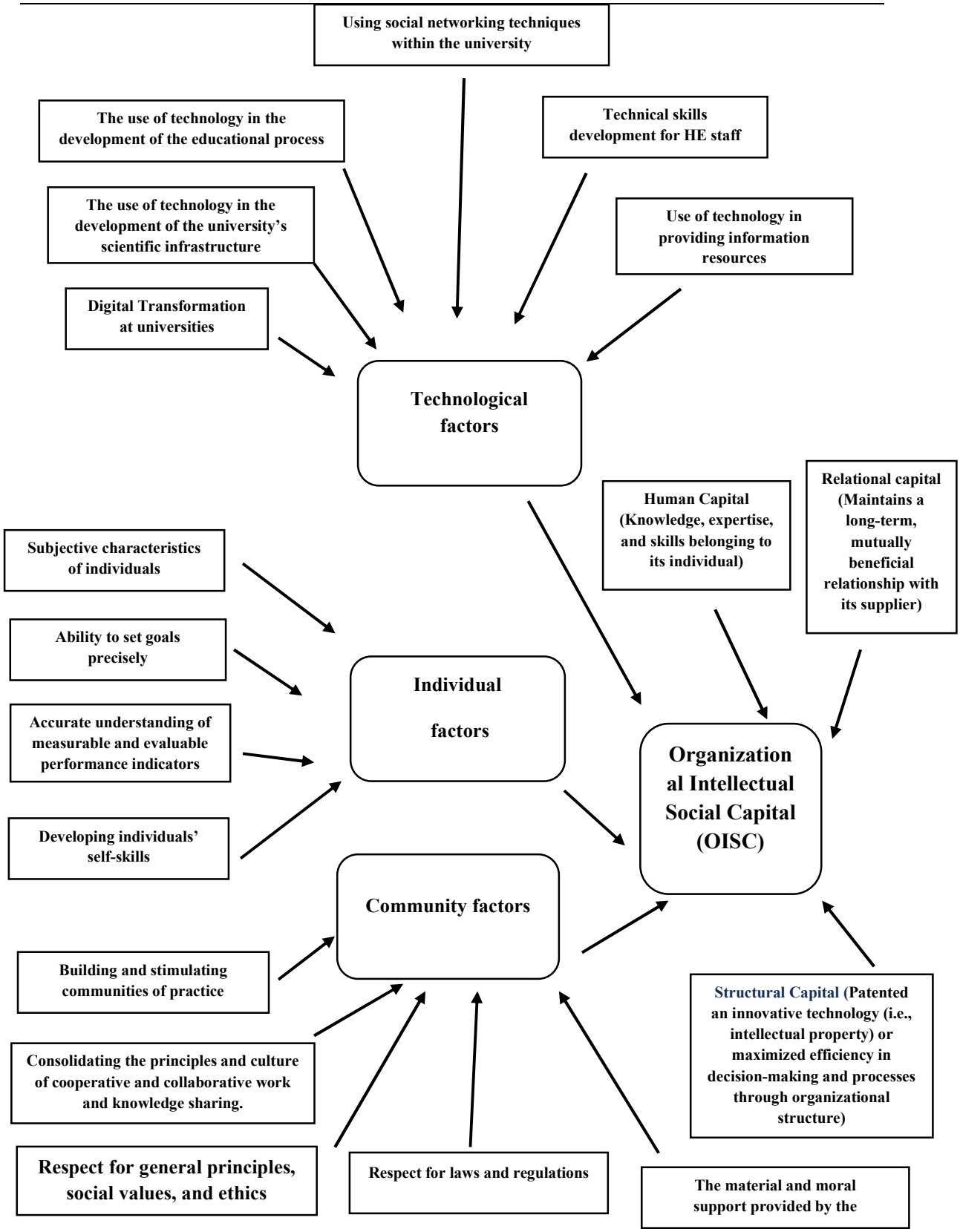

Figure 2: The proposed conceptual model of the relationship of technological, individual, and community factors of the activity theory and the Organizational Intellectual Social Capital (OISC) in HE institutions

Research method

In the present study, the researcher validated the conceptual model of the relationship between technological, individual, and community factors of the activity theory and the Organizational Intellectual Social Capital (OISC) in HE institutions by conducting a survey of 123 teachers (assistant professors, associate professors, professors) randomly chosen from Taibah University, King Saud University, and King AbdulAziz University. The time range for conducting the study extends from Dec-2023 to Mar-2024. A literature review analysis approach was also employed, whereby the researcher explored the connections between survey results and previous studies related to each variable in the conceptual model. Structural model analysis was conducted to examine hypothetical relationships between variables. Standardized correlation coefficients (path coefficients) were tested to determine if the three hypotheses of the proposed theoretical framework were supported by the empirical evidence.

Data gathering tools

The researcher dispersed a questionnaire to the sample to achieve data gathering tools. The questionnaire was developed based on the content validity established by a group of teachers at the university and is available online at the following address:

https://docs.google.com/forms/d/1QJsmIUpqsGBzixyL3SsMmg2vj8O2JDZuk3abhFnQQ1I/edit

Validity tests of the instrument

All the questionnaire instrument items were validated through a sample of teachers and experts in the field of study to achieve validity tests. Internal consistency (which is how closely associated a set of items are as a group), was tested by the researcher using Cronbach's alpha, a measure of scale reliability. Cronbach's alpha isn't a statistical test; it is a coefficient of reliability (or consistency). Generally, in most social science research situations, a reliability coefficient that measures .70 or higher is deemed to be 'acceptable'. Table 2 shows the internal consistency between the items of a survey instrument at each level of Cronbach's alpha (α) (*Cortina, 1993).*

Table 2. Internal consistency between the items of each Cronbach's alpha (α) level

Cronbach's Alpha (α)	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Table 3 shows the internal consistency between 21 items of the survey instrument of the present article through Cronbach's alpha (α) coefficient.

Table 3. Reliability statistics of the survey instrument

Survey instrument	Cronbach's Alpha (α)	N of Items	Internal consistency
For 123 university teachers	0.94	21	Excellent

The alpha coefficient for the 0.94 items of the survey instrument was Excellent, suggesting that the items on the questionnaire distributed to the sample have relatively high internal consistency.

Analysis and discussion of the model variables and their theoretical implications

In the present study, arithmetic means and standard deviations were used to explore the attitudes of teaching staff at universities toward the eight variables included in the proposed conceptual model. The trends and levels of responses to the survey instrument based on a Likert scale are shown in Table 4, which shows the percentages, arithmetic means, and standard deviations of every variable of the survey instrument for the teaching staff sample at universities.

Table 4. Trends and level of responses to the survey instrument based on a Likert scale

Likert scale	Strongly disagree	Disagree	Neutral	agree	Strongly agree
Likert value of each scale	1	2	3	4	5
Trends and level of responses	1→1.79	1.8→2.59	2.6→3.39	3.4→4.19	4.2→5

Table 5. Arithmetic mean and the SD of each item of the survey instrument

Main topic	Main Variables of the Structural Equation Modelling (SEM)	Arithmetic means and standard deviation	
		(AM)	(SD)
Technological Factors (TFs)	Technological factors influence the Organizational Intellectual Social Capital (OISC)	4.42	0.75
	Digital Transformation at Universities	3.84	1.02
	The Use of Technology in the Development of the University's Scientific Infrastructure	3.97	1.00
	Use of Technology in the Development of the Educational Process	3.84	0.99
	Using Social Networking Techniques Within the University	3.48	0.91
	Technical Skills Development for HE Staff	3.69	0.95
	Use of Technology in Providing Information Resources	3.76	0.97
Individual Factors (IFs)	Individual factors influence the Organizational Intellectual Social Capital (OISC)	4.17	1.04
	Subjective Characteristics of Individuals	3.95	1.00
	Ability to Set Goals Precisely	3.69	0.95
	Accurate Understanding of Measurable and Evaluable Performance Indicators	3.68	0.95
	Developing Individuals' Self-Skills	3.79	0.98
Community Factors (CFs)	Community factors influence the Organizational Intellectual Social Capital (OISC)	4.08	0.79
	Building and Stimulating Communities of Practice	3.52	0.93
	Consolidating the Principles and Culture of Cooperative and Collaborative Work and Knowledge Sharing.	3.66	0.94
	Respect for General Principles, Social Values, and Ethics	3.87	0.99

	Respect for Laws and Regulations	4.10	1.04
	Material and Moral Support Provided to Communities by Universities	4.05	1.05
Organizational Intellectual Social Capital (OISC)	Organizational Intellectual Social Capital (OISC) in HE	3.57	0.86
	Human Capital (Knowledge, expertise, and skills belonging to its individual)	3.97	1.05
	Relational Capital (Maintains a long-term, mutually beneficial relationship with its supplier)	3.65	0.94
	Structural Capital (Patented an innovative technology (i.e., intellectual property) or Maximized Efficiency in Decision-Making and Processes Through Organizational Structure)	3.82	1.02

Technological Factors (TFs)

Table 5 introduces the arithmetic means and standard deviations of each main item in the survey instrument. As technology lengthens its reach, "Digital Transformation at Universities," is an important variable within the main topic "Technological Factors (TFs)," with an arithmetic mean of 3.84 and a standard deviation of 1.02. Based on the data in Table 4, the trends and level of responses in the sample of respondents for the first variable were oriented towards agreeing that digital transformation at universities fosters social capital and promotes knowledge investment at universities.

In "The use of Technology in the Development of the University's Scientific Infrastructure," the second variable under the main topic, the arithmetic mean was 3.97, and the standard deviation was 1.00, showing that the trends and level of responses in the sample of respondents for the first variable were oriented towards agreeing that the use of technology in the development of the university's scientific infrastructure in fostering in driving organizational and social intellectual capital in higher education.

The third variable, "Use of Technology in the Development of the Educational Process," scored 3.84 AM with a standard deviation of 1.00. According to the Likert scale in Table 4, responses denote a positive score, revealing the trend toward agreeing that the use of technology in the development of the educational process fosters social capital (organizational and individual) and promotes further development of intellectual capital in higher education.

The fourth variable is a critical aspect, "Using Social Networking Techniques Within the University," which scored 3.48 AM with a standard deviation of 0.91. According to the Likert scale in Table 4, the findings positively agree that utilizing social networking techniques within the university enhances social capital (both organizational and individual) and facilitates the growth of intellectual capital in higher education.

Another vital component to consider is the fifth variable, "Technical Skills Development for HE Staff," which scored 3.69 AM with a standard deviation of 0.95. The responses indicate that technical skills development for HE staff is viewed positively, suggesting that it contributes to the growth of social capital, both at the organizational and individual levels. This, in turn, promotes the development of intellectual capital in higher education.

There is another important factor to consider, the sixth and final variable within the TF section, "Use of Technology in Providing Information Resources," which was

calculated to have a 3.79 AM with an SD of 0.97. The results shown in Table 4 using the Likert scale indicate that the utilization of technology to supply information resources has a positive impact on the enhancement of social capital, both organizational and individual, along with enabling the development of intellectual capital within the higher education system.

Numerous investigations have analysed the elements connected with activity theory and organizational intellectual capital in the higher education industry. As indicated by Evans and colleagues (2023), the achievement of university-industry partnership in driving digital transformation is dependent on the engagement and association between individual academics and industry professionals, as they work together as trusted partners. This suggests that it is essential for both parties to have close collaboration and effective communication. To become a significant driver of growth, particularly in higher education institutions, it is necessary to make a long-term and consistent effort. There is still much scope for further examination and research concerning additional variables like the implementation and marketing of technological innovation (Bekhet & Latif, 2018). One significant factor highlighted is the use of social networking methods within universities. Researchers have analysed the utilization of social networking platforms to assess how they can assist in communication, knowledge sharing, and partnership among students, faculty, and staff, thereby contributing to the intellectual capital of the organization (Li et al., 2019).

Individual Factors (IFs)

For "Subjective Characteristics of Individuals," the first important item within the topic "Individual Factors (IFs)," the arithmetic mean was 3.95 with a standard deviation of 1.00. The data reveals that those surveyed agree an individual's subjective traits play a crucial role in promoting social capital at both organizational and individual levels and facilitating the evolution of intellectual capital in the higher education sector.

In this category, importance is placed on the second variable, "Ability to Set Goals Precisely," which scored a 3.69 AM with an SD of 0.95. Based on the data, it has been determined that the respondents concur that having the capability to establish precise goals is vital in enhancing social capital, both at the organizational and individual levels, as well as aiding the development of intellectual capital in the higher education sector.

"Accurate Understanding of Measurable and Evaluable Performance Indicators," the category's third item, was also deemed favourable, bearing an Arithmetic Means of 3.68 and a deviation of 0.95. The data conclude that the participants agree on the importance of having a precise comprehension of measurable and evaluable performance indicators, which will assist in improving social capital, at both the organizational and individual levels. Additionally, this understanding can help foster intellectual capital growth within the higher education sector.

The fourth and final variable in the "Individual Factors" section, "Developing Individuals' Self-Skills" scored a 3.79 AM with an SD of 0.98. Based on the data collected, it is evident that the participants recognize the significance of developing individuals' self-skills to enhance social capital at both the individual and organizational levels and that self-skills development can facilitate the growth of intellectual capital in higher education structures.

Studies have examined how individual factors, such as personal drive and persistence, affect contributions to organizational intellectual capital in activity theory (Kubicek et al., 2022; Nardi, 2008). Setting clear and detailed goals can help individuals focus their efforts on events that contribute to the progress and accumulation of intellectual capital, align their actions with organizational objectives, and augment their intellectual capital (Mansour & Kapil, 2016; Nardi, 2008). Scholars have emphasized the importance of individuals clearly understanding measurable performance indicators. This helps them evaluate their performance and make informed decisions that contribute to developing intellectual capital within the organization (Wang et al., 2019; Engeström, 2001; Nardi, 2008).

Community Factors (CFs)

The first variable under the "Community Factors" section is "Building and Stimulating Communities of Practice," and was ranked with a 3.92 AM with a 0.93 standard deviation. Based on the Likert scale results, the responses indicate a positive score. This reveals a general agreement that building and stimulating communities of practice can enhance social capital (both organizational and individual) and further promote the development of intellectual capital in higher education.

A key community factor is "Consolidating the Principles and Culture of Cooperative and Collaborative Work and Knowledge Sharing," which scored an AM of 3.66 with a standard deviation of 0.94. According to the outcomes offered in Table 4, the responses indicate a positive score. This suggests that there is a general agreement that reinforcing the principles and culture of cooperative and collaborative work and knowledge sharing promotes the growth of intellectual capital in higher education and can improve social capital, both at the individual and organizational levels.

Professionals who were surveyed favoured the variable "Respect for General Principles, Social Values, and Ethics," which scored a 3.87 AM with a 0.99 SD. Based on the results, this response indicates a positive score. This implies that there is a consensus that respecting general principles, social values, and ethics fosters the development of intellectual capital in higher education, which can enhance social capital at the individual and organizational levels.

"Respect for Laws and Regulations," the fourth variable, which has an ethical theme, scored a 4.10 AM with a deviation of 1.04. The feedback received suggests a highly affirmative outcome. This indicates that there is agreement that adherence to Laws and Regulations promotes the growth of intellectual resources in higher education. This, in turn, can potentially strengthen social networks for individuals and organizations.

The final variable within the "Community Factors" section, "Material and Moral Support Provided to Communities by Universities," scored a 4.05 AM with a 1.05 standard deviation. The feedback indicates a high level of agreement that universities can foster the growth of intellectual resources in higher education by providing both material and moral support to communities. This can potentially strengthen social networks for individuals and organizations, which is seen as a positive outcome.

Cooperation within an organization's communities of practice is paramount for gathering and progressing intellectual capital. Trading information and working together significantly improves problem-solving skills, learning, and innovation, ultimately enhancing an organization's intellectual capital (Wenger-Trayner & Wenger-

Trayner, 2015). The creation of a workplace culture that values cooperation and collaboration can encourage knowledge-sharing, collective problem-solving, and cross-functional teamwork, which, in turn, can lead to the company's best use of intellectual capital (Ahmed et al., 2016).

Organizational Intellectual Social Capital (OISC)

The "Organizational Intellectual Social Capital (OISC)" section begins with the critical variable "Human Capital (Knowledge, expertise, and skills belonging to its individual)," which achieved a score of 3.97 AM with an SD of 1.05. The survey data suggests that Human Capital has a critical role in promoting social and intellectual capital in the higher education sector at both individual and organizational levels.

Next in the list of variables is "Relational Capital," which achieved an AM score of 3.65 with a standard deviation of 0.94. According to the survey data, Relational Capital plays a crucial part in fostering social and intellectual capital within the higher education industry on both an individual and organizational scale.

The final variable in the OISC section is "Structural Capital," which scored 3.82 AM with an SD of 1.02. Survey results indicate that Structural Capital is a crucial factor in promoting social and intellectual capital within the realm of higher education, both individual and organizational.

Researchers have explored different factors contributing to an organization's intellectual resources. Human capital is vital for an organization's success, and prioritizing workforce growth and cultivation can increase knowledge capital (Zhang & Phromphitakkul, 2021). Universities must accelerate the development of human capital, structural capital and relational capital and choose effective management models to promote intellectual capital to become a source of wealth and core competitiveness. This is a competitive advantage for universities and the key to becoming a first-class university in the country and even in the world (Zhang & Phromphitakkul, 2021).

Digital disruption is changing the global economy and causing significant changes in numerous industries. Higher education institutions must acclimate and innovate to adapt to the ever-changing landscape. They should embrace new technologies to offer fresh and valuable programmes to help them maintain growth and drive organizational, social, and intellectual capital in higher education. Leaders must adapt and acquire fresh insights and skills to break ahead in this speedily changing digital world. They can harness these through successful methods such as activity theory to achieve positive results in the face of these changes. It is important to note that digital transformation needs to go beyond the technological aspect to thrive, which is measurably agreed upon within the survey results (Engeström, 2001; Barma, 2008; Evans et al. 2023; Bekhet & Latif, 2018, Barhoumi et al., 2022; Li et al., 2019; Tokarčíková et al., 2020; Khan, 2019).

Validity and evaluation of the proposed structural model

The hypothetical relationships between variables were examined through path analysis. The three hypotheses of the proposed relationship between variables were tested using standardized correlation coefficients (path coefficients) to determine whether the empirical evidence of the research supported them.

Hypothesis testing

The results of the structural model used to examine the hypothetical research model provide statistical support for assumptions related to standardized correlation coefficients with t-values greater than 1.96. These findings indicate that the differences are statistically significant at the 0.05 level.

As Table 6 shows, H1, H2, and H3 are validated. This validation is true because all standardized correlation coefficients have t values greater than 1.96. These findings indicate that the differences are statistically significant at the 0.05 level.

Table 6. Test of hypotheses based on t values and path coefficients from regression and weight estimation in SPSS

H	Hypotheses	Path coefficient (Correlation Beta)	t-values	Hypothesis validation
H1	Technological factors: intellectual social capital in HE institutions	0.575	7.73 > 1.96	Valid
H2	Technological factors: intellectual social capital in HE institutions	0.467	5.80> 1.96	Valid
H3	Technological factors: intellectual social capital in HE institutions	0.502	6.38 > 1.96	Valid

Table 7. Weight estimation of each sub−variable in its related main variable

Sub Variables of the Structural model (SM)		Main variable	Path coefficient (Correlation Beta:) β
(TF1)	Digital Transformation at Universities	Technological factors	0.520
(TF2)	Use of Technology in the Development of the University's Scientific Infrastructure		0.546
(TF3)	Use of Technology in the Development of the Educational Process		0.411
(TF4)	Using Social Networking Techniques Within the University		0.733
(TF5)	Technical Skills Development for HE Staff		0.425
(TF6)	Use of Technology in Providing Information Resources		.465
(IF1)	Subjective Characteristics of Individuals	Individual factors	0.845
(IF2)	Ability to Set Goals Precisely		0.790
(IF3)	Accurate Understanding of Measurable and Evaluable Performance Indicators		0.356
(IF4)	Developing Individuals' Self-Skills		0.688
(CF1)	Building and Stimulating Communities of Practice	Community factors	0.752
(CF2)	Consolidating the Principles and Culture of Cooperative and Collaborative Work and Knowledge Sharing.		.621
(CF3)	Respect for General Principles, Social Values, and Ethics		.542
(CF4)	Respect for Laws and Regulations		.772
(CF5)	Material and Moral Support Provided to Communities by Universities		.798
(HC)	Human Capital (Knowledge, expertise, and skills belonging to its individual)	ual social capital in HE	0.744
(RC)	Relational Capital (Maintains a long-term, mutually beneficial relationship with its supplier)		0.756

(SC)	Structural Capital (Patented an innovative technology (i.e., intellectual property) or Maximized Efficiency in Decision-Making and Processes Through Organizational Structure)		0.637

Figure 3 shows the values of the standardized regression coefficient (Beta) for each main and sub-variable of the valid conceptual model of the relationships between technological factors, individual factors, community factors, and intellectual social capital in HE institutions and is shown in detail in Table 7.

Construct validity and average variance extracted

Conventional standards were used to evaluate composite reliability (CR) and calculate average variance (AVE). Fornell and Larcker (1981) and Nunnally and Bernstein (1994) state that these measures establish the model's validity. These authors assert that a composite reliability score of 0.70 suggests the proposed structural model is validated. This technique permits the researcher to evaluate the model's internal consistency and component consistency. A high composite reliability suggests that all items in the model consistently evaluate the same underlying concept.

The analysis applied to this study shows that the threshold for construct validity was exceeded by 0.70 for a composite reliability value of 0.93, as indicated in Table 6. The structural model evaluates the consistency of the construct across all items.

The AVE is the average sum of variance in indicator variables that a construct manages to explain. According to Fornell and Larcker (1981), the typical variance mined for measuring convergent validity is sufficient when it exceeds 0.5. Based on the results in Table 6, the AVE is equal to 0.58, surpassing the value of 0.5, which indicates that the average variance extracted for measuring the convergent validity of the relationship between the variables – external global knowledge resources (EKRs), organizational innovation (OI), and organizational performance (OP) – is sufficient in higher education.

The composite reliability was calculated using SPSS to determine the component matrix output from the menu analysis, Dimension reduction, and factor analysis, then Excel was used to determine the value of λ, where λ is the squared value and ε = (1- λ squared). The following formulas by Fornell and Larcker (1981) show the values of composite reliability were calculated along with the average variance extracted and results are shown in Table 8.

$$Average\ variance\ extracted = \frac{\Sigma\ (\lambda\ \text{squared})}{N}$$

$$Composite\ reliability = \frac{(\Sigma\ \lambda\ )\text{squared}}{(\Sigma\ \lambda\ )\text{squared}\ +\ (\Sigma\ \varepsilon)}$$

Table 8. Composite Reliability and Average variance extracted

Construct	Composite Reliability	Average variance extracted
The structural model	0.93	0.58

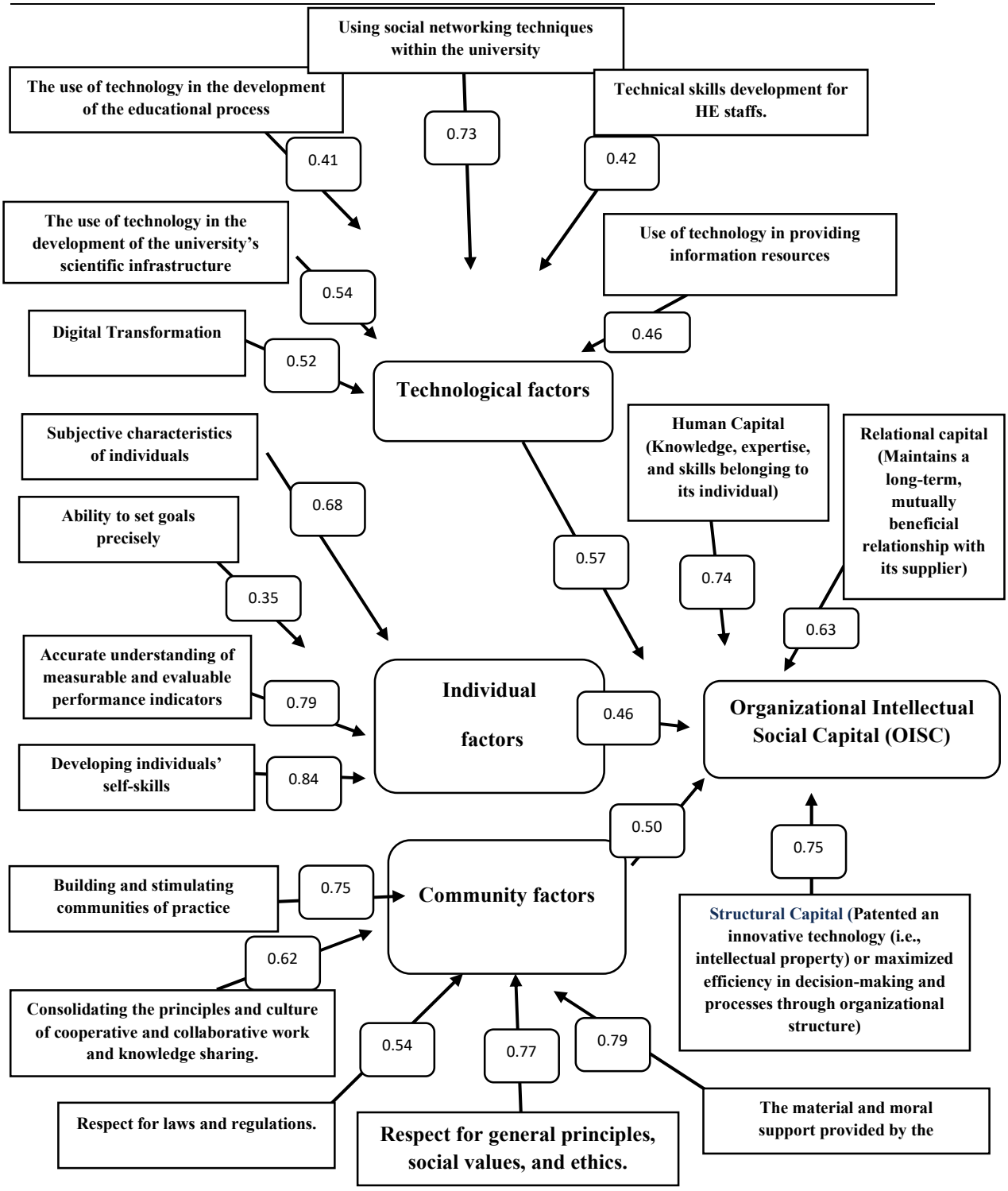

Figure 3. Path coefficient: A standardized regression coefficient (Beta) for the proposed relationships among TF, IF, CF, and Intellectual social capital in HE institutions.

Conclusion

The current study contains three major theoretical advances. The uniqueness of the research is first emphasized because little literature exists to advance knowledge of problems associated with the application of activity theory to promote organizational social capital in higher education and knowledge investment. This bridges the knowledge economy-society gap in the higher education context.

It contributes to existing research on the conceptualization of technological, individual, and community factors and their connection with organizational intellectual social capital (OISC), especially while keeping in mind that technological, individual, and community levels are critical factors that heavily affect organizational intellectual social capital in different contexts (Uden & Vecchio, 2018). Studies of such ideas are rarely performed in higher education, although much literature on OISC is regarded as crucial. The influences on OISC in higher education are still being identified, and this research has further clarified the issue under investigation.

A second theoretical contribution is the creation associated with a theoretical model of some idea or phenomenon. The study has tried to investigate OISC from the lens of "activity theory" (Adamides, 2023). The research model was derived from analysing diverse literature sources (Sikalima, 2021; Nardi, 2008; Engeström, 2001; Baguma et al., 2019). The research's theoretical model was informed by theoretical frameworks addressing technological ideas and information technology (IT), individual factors, and community factors impacting OISC.

Making use of the path analysis technique, the relationships of the three main variables and the links between each main variable and their sub-variables were analysed. The conceptual model was evaluated with information from teachers in different higher education fields to confirm its validity. The general examination of the findings established the cause-and-effect relationships in this particular model, together with all elements of the structural model assess the very same idea regularly, as confirmed by the high composite reliability of 0.93 exceeding the threshold of 0.70.

Two important practical contributions are made in this research: The initial impact is to attract universities worldwide to deepen their discussions about OISC. Additionally, better cooperation among higher education leaders is required to exchange ideas and community engagement, individual development, and leverage technology to improve higher education institutions.

The investigative tool is the second practical contribution. The survey based on earlier studies may serve as a practical instrument for evaluating the social and intellectual capital of organizations in higher education institutions. This research survey could be utilized in whole or even in parts as per the higher education goals.

Methodological advancements from this research include: the creation and validation of a research questionnaire used for empirical study. With a quantitative approach, this study offered a dependable instrument for assessing research using a self-administered questionnaire. The survey comprises dimensions and scales evaluating the core concepts of activity theory – technological, individual, and community factors – and their relation to OISC.

The researcher applied the literature review analysis method to review relationships between survey results and prior studies of secondary and primary

variables in the theoretical framework. The hypothetical relationships among variables were investigated using a structural model analysis.

The broader implications of this study extend beyond theoretical advancements and practical contributions. By addressing the integration of the knowledge economy and society in higher education, this research highlights the importance of fostering a collaborative and technologically adept academic environment. The insights grown from this study can enlighten policy-making and strategic planning in higher education institutions, promoting practices that enhance social and organizational capital. Additionally, the study underscores the necessity of continuous professional development for educators, emphasizing the role of technical skills and digital literacy in the modern educational landscape.

Furthermore, the theoretical model developed in this research can serve as a groundwork for future studies exploring the interplay of technological, individual, and community factors in various educational contexts. This model can be adapted and tested in different cultural and institutional settings, providing a comparative perspective on the effectiveness of strategies aimed at enhancing OISC.

References

- Adamides, E. D. (2023). Activity theory for understanding and managing system innovations. *International Journal of Innovation Studies, 7*(2023), 127-141.
- Ahmad, A., Jameel, A. S., & Raewf, M. B. (2021). Impact of Social Networking and Technology on Knowledge Sharing among Undergraduate Students. *International Business Education Journal, 14*(1), 1-16.
- Ahmed, F., Shahzad, K., Aslam, H., Bajwa, S.U. and Bahoo, R., 2016. The role of collaborative culture in knowledge sharing and creativity among employees. *Pakistan Journal of Commerce and Social Sciences (PJCSS)*, *10*(2), pp.335-358.
- Ahmed, Saham Yass, & Abdul Latif, Samar Abdullah. (2019). Mechanisms to Support Communities of Practice for Developing Social Capital in Primary Schools in Egypt. *Faculty of Education, Al-Azhar University, 38*(182g2), 101-176.
- Al-Anazi, H.B. S. B. K. (2023). Intellectual Capital Requirements at Princess Nourah Bint Abdul Rahman University to Achieve the Competitive Advantage. *Journal of the Faculty of Education - Al-Azhar University, 3*(199), 328-367.
- Albertini, E., & Berger-Remy, F. (2019). Intellectual Capital and Financial Performance: A Meta-Analysis and Research Agenda. *M@n@gement, 22*(2), 216-249.
- Aldaremi, A. (2022). *Activity Theory as a Lens for Managerial Innovation in the Kuwaiti Amiri Guard* (Unpublished Doctor Dissertation), University of Salford, England.
- Alfuhailah, I. Z.H. (2023). Developing the Human Capital Department in the Ministry of Education in the Kingdom of Saudi Arabia in light of the standards of institutional excellence Suggested formula. *Journal of the Faculty of Education - Ain Shams University,* (47), 17-70.
- Al-Husseini, S. J. (2021). Social capital and individual motivations for information sharing: A theory of reasoned action perspective. *Journal of Information Science, 94*(6), https://doi.org/10.1177/01655515211060532

- Ali, M.A.; Hussin, N.; Haddad, H.; Al-Araj, R.; Abed, I.A. A Multidimensional View of Intellectual Capital: The Impact on Innovation Performance. *J. Open Innov. Technol. Mark. Complex. 7*(216), 1-25.
- ALI, Q. B., ZIN, L. B. M., & Bin ISMAIL, S. A. (2023). The Role Of Human Capital, Structural Capital, And Relational Capital In Higher Education Institutions Performance. SBM COB UUM Conference on *Business Management,* School of Business Management Universiti Utara Malaysia, Malaysia, 2023.
- Apfeld, B., Coman, E., Gerring, J., & Jessee, S. (2021). Education and Social Capital. *Journal of Experimental Political Science*, (2021) 1–27.
- Aun, W. T., Liang, K. T. T., Darmaraj, S. R., Khun, J. L. T., & Hong, A, N, H. (2022). Social Capital development amongst college and university students in online and classroom education. *Proceedings of the International Conference on Research in Management & Technovation, 34*(2022), 1-5.
- Baguma, R., Bagarukayo, E., Namubiru, P., Brown, C., & Mayisela, T. (2019). Using WhatsApp in Teaching to Develop Higher Order Thinking Skills-a Literature Review Using the Activity Theory Lens. *International Journal of Education and Development using Information and Communication Technology (IJEDICT), 15*(2), 98-116.
- Barhoumi, C., Alsaysi, A. & Essid, S. (2022). Diagnosis of the effectiveness of the e-learning solutions adopted in Saudi higher education during the COVID-19 pandemic. Online Information Review, *46*(6), pp. 1132-1151. https://doi.org/10.1108/OIR-02-2021-0078
- Batiibwe, M. S. K. (2019). Using Cultural Historical Activity Theory to understand how emerging technologies can mediate teaching and learning in a mathematics classroom: a review of literature. *Batiibwe Research and Practice in Technology Enhanced Learning*, (2019), 1-20.
- Bekhet, H.A., Abdul Latif, N.W. (2018). The impact of technological innovation and governance institution quality on Malaysia's sustainable growth: Evidence from a dynamic relationship. *Technology in society,* 54, 27-40.
- Chatterji, N., & Kiran, R. (2022). The influence of human, organizational and relational capital of universities on their performance: a developing economy perspective. *Journal of Intellectual Capital, 24*(3), 799-829.
- Chetty, R., Jackson, M. O., Kuchler, T, Stroebel, J., Hendren, N., Fluegge R.B., Gonzalez, F., Grondin, A., Jacob, M., Johnston, D., Koenen, M., Laguna-Muggenburg, E., Mudekereza, F., Rutter, T., Thor, N., Townsend, W., Zhang, R., Bailey, M., Barberá, P., Bhole, M., & Wernerfelt, N. (2022). Social capital I: measurement and associations with economic mobility. *Nature, 608*(2022), 108-121.
- Chukwuazom, M. O. (2022). *Effects Of Intellectual Capital On Organizational Performance In Tai Solarin University Of Education* (Unpublished Master Dissertation), Near East University, Northern Cyprus.
- Claridge, T. (2018). Dimensions of Social Capital - structural, cognitive, and relational. *Social Capital Research,* 2018, 1-4.
- Das, G. M., & Lalitha, S. (2024). Social Capital and Social Inclusion in Higher Education Case Study Narratives on the Lived Experiences of Scheduled Caste Youth in Tamil Nadu, India. In R. Baikady et al. (eds.), *The Palgrave Handbook of Global Social Problems*, Springer Nature Switzerland AG.

- Du, W., & Yang, H. (2020). Research on Performance Evaluation of Knowledge Management Innovation in Colleges and Universities. *Advances in Economics, Business and Management Research, 146*(2020), 283-287.
- Engeström, Y. (2001). Expansive learning at work: Toward an activity theoretical reconceptualization. Journal of Education and Work, 14(1), 133-156.
- Evans, N., Miklosik, A., Du, J T. (2023). University-industry collaboration as a driver of digital transformation: Types, benefits and enablers, Heliyon, 9 (10), e21017, ISSN 2405-8440,
- Fox, S., Taylor, C., Evans, C., & Rees, G. (2023). The Positional Effects of Education on Social Capital in the UK. *International Journal of Sociology, 53(*4), 261-282.
- Hama, N. O., Cavusoglu, B. (2023). The Sustainability of Intellectual Capital in Enhancing Organizational Innovation: A Case Study of Sulaimani Polytechnic University. *Sustainability, 15*(2023), 1-21.
- Hidayah, N., Nugroho, L., & Prihanto, H. (2021). Human Capital and Relational Capital on University Quality with Environmental Uncertainty as Moderating Variables (Evidence in Java Island-Indonesia). *BILTURK, The Journal of Economics and Related Studies, 3*(3), 117-132.
- Ilyenkov, E. F. (1982). The abstract and concrete dialectic of Marx's capital. Moscow, Russia: Progress.
- Indiran, L., Baskaran, S., Yaacob, T.Z., Kohar, U.H.A., Senin, A.A. and Therumurthy, T. (2023). The Role of Intellectual Capital in Fostering Innovation Capability in Higher Education Institutions. International Journal of Academic Research in Business and Social Sciences, 13(9), 847– 860.
- Institute for Social Capital. (2024). Social Capital, the Creation of Knowledge and Knowing Capacity, and Innovation. Australia. https://www.socialcapitalresearch.com/one-hundred-years-social-capital/social-capital-creation-knowledge-knowing-capacity-innovation/
- Jardón, C-M. F., & Silva, A. F. C. (2021). Structural Capital Value Addition To Timber and Related Industries Value Chain. *Revista de Administração da UFSM, 13*(4), 895-917.
- Jardón, C-M., Silva, A. F. C. D. (2020). Structural Capital Value Addition To Timber and Related Industries Value Chain. Rev. Adm. UFSM, Santa Maria, 13(4), 895-917.
- Jicha, K., Kick, E., Fulkerson, G., & Thompson, G. (2019). Explaining Social Capital Formation in a Hinterlands Context: The Case of Carriacou, Grenada. *Comparative Sociology,18*(2019), 33-65.
- Khan, M.H., 2019. Knowledge, skills and organizational capabilities for structural transformation. *Structural Change and Economic Dynamics*, *48*, pp.42-52.
- Khoshnaw, D., & Karadas, G. (2024). Transactional leadership and intellectual capital, the mediating role of knowledge sharing: The study of customs employees in Sulaymaniyah governorate. *Heliyon,10*(2024), 1-14.
- Kubicek, B., Prem, R., Baumgartner, V., Uhlig, L., Hodzic, S. and Korunka, C., 2022. Correction to: Cognitive Demands of Flexible Work. In *Flexible Working Practices and Approaches: Psychological and Social Implications* (pp. C1-C1). Cham: Springer International Publishing.

- Leontiev, A. N. (1978). Activity, consciousness, and personality (M. J. Hall, Trans.). Englewood Cliffs, NJ: Prentice Hall.
- Li, Y., Song, Y., Wang, J. and Li, C., 2019. Intellectual capital, knowledge sharing, and innovation performance: Evidence from the Chinese construction industry. *Sustainability*, *11*(9), p.2713.
- Mansour, E.Z. and Kapil, P., 2016. The role of intellectual capital in promoting knowledge management initiatives. *Knowledge Management & E-Learning*, *8*(2), p.317.
- Mironenko, I. A. (2013). Concerning Interpretations of Activity Theory. *Integr Psych Behav., 47*(2013), 376–393.
- Mkadmi, A., & Bsir, B. (2024). Tunisian libraries and audio-visual centers in digital economy: pivotal roles in cultural investment strategy. *Journal of Information Sciences, 23*(1), 1-22.
- Mohamed, M. E. S., & Elsheikh, B. M. O. (2018). The Effect of Intellectual Capital on Organizational Innovation - An Applied Study in the Faculty of Administrative Sciences, Najran University. *IUGJEBS, 26*(3), 30-56.
- Mongrut, S., & Berggrun, L. (2024). The role of intellectual and social capital in funding businesses: a cross-country analysis. *Academia Revista Latinoamericana de Administracion, 37*(1), 101-123.
- Mrah, I. (2024). Investigating Moroccan Undergraduate Students' Digital Literacy Skills for Academic-based Research: the Case of Third-Year Students of English Studies at Mohammed I University. *Journal of Information Sciences, 23*(1), 45-67.
- Nardi, B. A. (2008). Studying context: A comparison of activity theory, situated action models, and distributed cognition. In Proceedings of the 2008 ACM Conference on Computer Supported Cooperative Work (pp. 87-96). ACM.
- Peces, M. C., & Trillo, M. A. (2023). Relational Capital in the Technology Sector: An International Strategic Model. *Sustainability, 15*(2023), 1-18.
- Pusztai, G. (2014). The Effects of Institutional Social Capital on Students' Success in Higher Education. *HERJ - Hungarian Educational Research Journal, 4*(3), 1-13.
- Schlossarek, M., Harmáček, J., Seidlová, A., Suchá, A. (2024). Inequalities and Social Capital as Factors of Subjective Well-Being: Case Study from Western Province, Zambia. *Journal of Happiness Studies*, (2024), 1-24.
- Sikalima. (2021). *Digital skills challenges and opportunities for digitally under-resourced primary schools in Zambia: an exploratory study* (Unpublished Master Dissertation), University of Johannesburg, South Africa.
- Sisodia, G., Jadiyappa, N., & Joseph, A. (2021). The relationship between human capital and firm value: Evidence from Indian firms. *Cogent Economics & Finance, 9*(2021), 1-15.
- Sulinska, I.(2018). Complexities Of Social Capital In Boards Of Directors (Unpublished Doctor Dissertation), Copenhagen Business School,
- Szudrowicz, I. (2020). *Research On The Connection Between Relational Capital And Company Performance*. Research Papers Of Wroclaw University Of Economics And Business, Prace Naukowe Uniwersytetu Ekonomicznego We Wrocławiu.
- Tašner, V., Gaber, S. (2018). *Social Capital and Education*. Springer Nature Singapore Pte Ltd.

- Technology in Society, 54, Pages 27-40, ISSN 0160-791X, https://doi.org/10.1016/j.techsoc.2018.01.014.
- Tokarčíková, E., Malichova, E., Kucharčíková, A. and Durišová, M., 2020. Importance of technical and business skills for future IT professionals. *Amfiteatru Economic*, *22*(54), pp.567-578.
- Uden, L. & Vecchio, P.D. (2018). Transforming the stakeholders' Big Data for intellectual capital management. *Meditari Accountancy Research, 26*(3), 2018 pp. 420-442.
- University of Helsinki. (2023). CRADLE Activity Theory. Retrieved from https://www.helsinki.fi/en/researchgroups/center-for-research-on-activity-development-and-learning/activity-theory-at-cradle
- Uzzi, B. and Lancaster, R., 2003. Relational embeddedness and learning: The case of bank loan managers and their clients. *Management Science*, *49*(4), pp.383-399.
- Vezzosi, M., 2009. Doctoral students' information behaviour: an exploratory study at the University of Parma (Italy). *New Library World*, *110*(1/2), pp.65-80.
- Vygotsky, L. (1985). Thought and language. Translated by F. Seif. Paris: Missidor/Edition Social.
- Wang, Y., Su, X., Wang, H., & Zou, R. (2019). Intellectual capital and technological dynamic capability: evidence from Chinese enterprises. *Journal of Intellectual Capital*, *20*(4), 453-471.
- Wang, Y., Xiong, J., Li, W., Na, M., & Yao, M. (2020). The Effect of Social Capital on Environmental Pollution in China—Suppression or Promotion? *Int. J. Environ. Res. Public Health*, *17*(24), 1-17.
- Wang, Z., Cai, S., Liu, M., Liu, D. and Meng, L., (2020). The effects of self-reflection on individual intellectual capital. *Journal of Intellectual Capital*, *21*(6), pp.1107-1124.
- Wenger-Trayner, E., & Wenger-Trayner, B. (2015). Communities of practice: A brief introduction. Retrieved from https://wenger-trayner.com/introduction-to-communities-of-practice/
- Zamiri, M., & Esmaeili, A. (2024). Methods and Technologies for Supporting Knowledge Sharing within Learning Communities: A Systematic Literature Review. *Administrative Sciences, 14*(17), 1-34.
- Zhang, B., & Phromphitakkul, W. (2021). Influence of Three Dimensions of Intellectual Capital on Relationship Performance of University Lecturers: A Case of Universities in Henan Province, China. *Journal of Service Science and Management, 14*(2021), 369-381.

تأثير العوامل التكنولوجية والفردية والمجتمعية في تحفيز رأس المال الفكري الاجتماعي التنظيمي في التعليم العالي: تحليل المسار

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المستخلص

الهدف: يهدف هذا البحث إلى فهم تأثير نظرية النشاط على رأس المال الاجتماعي التنظيمي في مؤسسات التعليم العالي، ومدى مساهمتها في الاستثمار المعرفي لدمج اقتصاد المعرفة والمجتمع ضمن سياق التعليم العالي.

التصميم/المنهجية/الأسلوب: قام الباحث باختبار النموذج البحثي المقترح من خلال استبيان شمل 154من الأساتذة والخبراء تم اختيارهم بصورة عشوائية من ثلاث جامعات سعودية وهي (جامعة طيبة، وجامعة الملك عبد العزيز، وجامعة الملك سعود). كما تم إجراء تحليل للمصادر الأدبية ذات الصلة لاستكشاف جوانب الاتفاق والتشابه بين نتائج الاستبيان والدراسات السابقة المرتبطة بكل عامل من عوامل النموذج الهيكلي. كذلك تم تحليل النموذج الهيكلي لفحص العلاقات الافتراضية بين المتغيرات، حيث تم اختبار معاملات المسار المعيارية لتحديد مدى دعم الأدلة التجريبية للفرضيات المطروحة.

النتائج: أكد التحقق التجريبي من الفرضيات وجود علاقة بين العوامل التكنولوجية والفردية والمجتمعية، مما يعزز رأس المال الاجتماعي المؤسسي في مؤسسات التعليم العالي. أظهرت التحليلات أن قيمة الثبات المركب بلغت 0.93، متجاوزة الحد الأدنى المقبول وهو 0.70، مما يشير إلى أن جميع العوامل تقيس نفس البنية بشكل متسق. كما كشفت الدراسة أن قيمة التباين المتوسط بلغت 0.58، متجاوزة الحد الأدنى البالغ 0.5، مما يؤكد صلاحية النموذج بناءً على معايير الإحصائية التقاربية المتعارف عليها.

الأصالة/المساهمة البحثية: توفر هذه الدراسة فهماً معمقاً للعوامل التكنولوجية والفردية والمجتمعية التي تؤثر في رأس المال الاجتماعي والتنظيمي في مؤسسات التعليم العالي، مما يساهم في تطوير استراتيجيات أكثر فاعلية لتعزيز رأس المال المعرفي والتنمية المؤسسية.

الكلمات المفتاحية: العوامل التكنولوجية – العوامل الفردية – العوامل المجتمعية – رأس المال الاجتماعي التنظيمي.