Tot V., Supić D., (2026). Integration of Formal, Non-formal and Informal Education in the Corporate System: From the Concept of Knowledge to its Applicability, *International Journal of Management Trends: Key Concepts and Research, 5(1), 60-71.*

Review paper

UDC: 378.147

Received: April 29, 2026.

10.58898/ijmt.v5i1.60-71

Accepted: May 20, 2026.

Check for updates

Integration of Formal, Non-formal and Informal Education in the Corporate System: From the Concept of Knowledge to its Applicability

Vilmoš Tot[1], Dejan Supić[2*]

[1] Faculty of Business Economics, Sremska Kamenica, Serbia, email: vilmos.tot@educons.edu.rs

[2] Educons University, Sremska Kamenica, Serbia, email: dejan.supic@educons.edu.rs

Abstract: This paper examines the importance of formal, non-formal and informal education within the corporate system, with a special focus on their integration to generate applicable knowledge that enables competitiveness and social responsibility of organizations. The paper is grounded in the assumption that modern society is characterized by a paradox of the availability of knowledge with a simultaneous deficit of its practical application. Based on theoretical and conceptual analyses, as well as the proposed empirical model, the need to develop an integrated model of corporate education that connects individual competencies with organizational and social goals is indicated.

Keywords: corporate education, applicability of knowledge, formal education, non-formal education, informal education, human capital

Preliminary Considerations

One of the key challenges of contemporary society is reflected in the paradox of knowledge—it has never been more accessible, yet it often remains insufficiently applicable. This issue stems from the ways in which knowledge is acquired, structured, and utilized in practice.

Historically, knowledge was a scarce resource, frequently controlled by privileged social groups, which influenced both its accessibility and application (Polanyi, 1966). With the development of institutional education, particularly following the reforms of Jan Amos Comenius, knowledge became more widely available across social strata; however, the problem of its practical applicability persisted (Comenius, 2007).

The rapid advancement of information technologies has further increased the availability of knowledge, yet it has not automatically resulted in its effective application. Consequently, a mismatch has emerged between educational outcomes and labor market requirements, as confirmed by contemporary research on human capital (Becker, 1993; World Economic Forum, 2020).

*Corresponding author: dejan.supic@educons.edu.rs

Recent trends in the literature indicate a growing focus on the integration of digital technologies and knowledge management. Organizations are increasingly leveraging artificial intelligence and advanced information systems to enhance learning processes and decision-making (Cantu-Ortiz, 2021; Aljuwaiber, 2026). In this context, the central question is no longer how much knowledge is available, but rather the extent to which it can be effectively applied in the process of value creation (Davenport & Prusak, 1998). This perspective is further supported by empirical research examining the relationship between knowledge management, innovation, and organizational performance (Cristache et al., 2025).

The observed discrepancy between formally acquired qualifications and actual market demands highlights the need to redefine educational strategies within organizations. The scientific contribution of this paper lies in moving beyond the isolated analysis of different forms of education and introducing an integrative approach that emphasizes the synergy between structured (formal) and experiential (informal) learning as a key driver of competitiveness (Marsick & Watkins, 2001; Garavan et al., 2012).

Given the complexity and multidisciplinary nature of the research problem, this study is primarily conceptual and serves as a foundation for future empirical investigation. Its objective is not only to provide a theoretical analysis but also to initiate a broader academic and professional discussion on the advancement of corporate education.

In this regard, the paper is positioned as a starting point for the development of a research framework and a future project that would involve key stakeholders from academia, industry, and institutions, with the aim of empirically validating the proposed model and supporting its practical implementation.

The Concept of Knowledge and Its Applicability

Knowledge can be understood as the central resource of the modern economy, where its value lies not merely in its accumulation, but in its effective application. Contemporary research emphasizes that organizational competitiveness increasingly depends on the ability to integrate and apply knowledge through structured processes (Teece, 2007; Cristache et al., 2025).

In this context, knowledge management extends beyond the storage and dissemination of information and encompasses the processes of knowledge creation, sharing, and application, with a strong linkage to innovation (Aljuwaiber, 2026). However, challenges arise when educational processes remain fragmented and insufficiently interconnected. In such cases, knowledge often remains underutilized, contextually misaligned, or functionally ineffective (Alavi & Leidner, 2001).

Therefore, the key challenge lies in integrating different forms of education into a coherent system capable of transforming knowledge into practical value.

Contemporary knowledge management theories distinguish between explicit and tacit knowledge. According to Ikujiro Nonaka and Hirotaka Takeuchi, organizational knowledge is continuously transformed through the SECI model, which includes socialization, externalization, combination, and internalization processes (Nonaka & Takeuchi, 1995). This dynamic interaction enables the conversion of individual knowledge into organizational knowledge and facilitates its application in practice.

Within this framework, informal learning plays a crucial role in the transfer of tacit knowledge, while formal and non-formal education contribute to its structuring and expansion. The applicability of

knowledge, therefore, depends on an organization's capacity to integrate these processes and support continuous knowledge transformation.

The Nature of Knowledge in Organizations and the Process of Its Transformation

Modern approaches to knowledge management conceptualize knowledge as a complex and multidimensional system rather than a homogeneous entity. The distinction between tacit and explicit knowledge provides a fundamental basis for understanding knowledge dynamics within organizations.

Tacit knowledge is personal, experience-based, and difficult to formalize, whereas explicit knowledge is codified, structured, and easily transferable through formal channels. The interaction between these two forms of knowledge is continuous and essential for organizational learning.

The SECI model explains this interaction as an ongoing process in which knowledge is created, transformed, and applied. In this context, formal education primarily supports the development of explicit knowledge, non-formal education enables its contextualization, and informal learning facilitates the transfer and development of tacit knowledge through everyday organizational practices.

This perspective highlights that knowledge applicability is not an inherent characteristic of knowledge itself, but rather a result of organizational capabilities to integrate and transform knowledge across different contexts.

Knowledge Management and Organizational Learning as a Basis of Competitiveness

Knowledge management represents a systematic approach to identifying, creating, sharing, and applying knowledge within organizations (Davenport & Prusak, 1998; Alavi & Leidner, 2001). Empirical research confirms that knowledge creation and sharing processes serve as key drivers of innovation, which in turn influence organizational performance (Cristache et al., 2025).

In addition, contemporary approaches emphasize the role of digital technologies and artificial intelligence in enhancing knowledge management processes, thereby improving decision-making efficiency and organizational adaptability (Cantu-Ortiz, 2021).

Effective knowledge management enables organizations to increase operational efficiency, foster innovation, and achieve sustainable competitive advantage (Teece, 2007).

The concept of the learning organization, developed by Peter Senge, underscores the importance of continuous learning as a strategic resource (Senge, 1990). Furthermore, Chris Argyris and Donald Schön emphasize the role of reflection and adaptation in organizational learning processes (Argyris & Schön, 1978).

In the context of the Republic of Serbia, the application of the learning organization concept remains limited due to challenges related to institutional readiness, organizational culture, policy frameworks, and resource availability for long-term investment in knowledge and learning. Although certain elements of this concept are present in practice, its systematic implementation has not yet been fully institutionalized (Savić Tot, 2022).

From the perspective of dynamic capabilities theory, long-term competitiveness depends on an organization's ability to integrate, build, and reconfigure internal and external competencies (Teece, 2007). An integrated education system plays a crucial role in developing these capabilities by enabling the transformation of knowledge into innovation and market value.

Intellectual Capital and the Value of Knowledge

Knowledge constitutes the foundation of intellectual capital, which encompasses human, structural, and relational components (Edvinsson & Malone, 1997; Stewart, 1997).

Human capital refers to employees' knowledge, skills, and competencies; structural capital includes organizational processes, databases, and technological infrastructure; while relational capital reflects relationships with customers, partners, and other stakeholders.

The integration of different forms of education directly contributes to the development of all components of intellectual capital. This perspective aligns with previous research emphasizing that the ability to apply knowledge represents a key determinant of competitiveness and socio-economic development.

Education processes in a corporate context

Formal education as a foundation

Formal education provides systematized and structured knowledge that is the basis for further development of competences (Becker, 1993). However, its limitations are reflected in the lack of flexibility and slow adaptation to changes in the business environment (World Economic Forum, 2020).

Non-formal education as an upgrading process

Non-formal education enables the deepening and contextualization of knowledge through training and development programs (Garavan et al., 2012), while informal education is a key element in the process of transforming knowledge into practice (Marsick & Watkins, 2001).

However, without a clear system and strategic direction, this process can be fragmented and inefficient.

Informal education as a factor of applicability

Informal education is a key element in the process of transforming knowledge into practice. It enables individuals to understand the context and apply knowledge in real-life situations.

Through daily activities, interactions, and problem-solving, employees develop adaptability and decision-making, which forms the basis of modern knowledge-based organizations (Marsick & Watkins, 2001).

Integration of education as a strategic model

The integration of formal, non-formal and informal learning is a key mechanism for the development of organizational learning and competitiveness (Senge, 1990; Teece, 2007).

Contemporary research further emphasizes that organizations that integrate different sources of knowledge and use digital tools achieve higher levels of innovation and performance (Aljuwaiber, 2026; Cristache et al., 2025)

According to research in the field of knowledge management, organizations that successfully integrate different sources of knowledge achieve higher levels of innovation and efficiency (Alavi & Leidner, 2001).

Therefore, it is necessary to develop an integrated model of education that includes:

- Systematically connecting all forms of learning
- Strategic management of knowledge and competences
- Orientation towards the social and organizational benefits of knowledge

Corporations have a special potential to develop such a model, because they have resources, infrastructure and clear goals. Corporations can become the bearers of the transformation of education systems through the development of their own learning models.

This approach allows:

- Increasing competitive advantage
- Developing innovation
- Improving human capital
- Contributing to the organization's social responsibility.

The concept of a learning organization, developed by Peter Senge (1990), further emphasizes the importance of continuous learning as a strategic resource. Organizations that successfully integrate different forms of education create conditions for the development of collective knowledge and long-term adaptability.

Research model and hypotheses

The proposed research model and instrument provide a conceptual framework for future empirical testing, and have been developed with the aim of operationalizing the key relationships identified in the theoretical part of the paper.

The aim of the research is to examine the impact of the integration of education on the competitiveness of organizations.

Hypotheses:

H1: The integration of formal, non-formal and informal education has a positive impact on the applicability of knowledge.

H2: Applicability of knowledge has a positive impact on the innovativeness of the organization.

H3: Innovation has a positive impact on competitiveness.

To test the hypotheses, **the Structural Equation Modeling (SEM) is used**. The proposed model is conceived as **a serial mediation model** that examines indirect effects through the causality chain.

- **Trajectory 1:** Examines the direct impact of educational integration on the applicability of knowledge.
- **Trajectory 2:** Analyzes how the applicability of knowledge serves as a mediator to innovation.
- **Trajectory 3:** Tests the final relationship where innovation results in increased competitiveness of the organization.

This model overcomes simple correlations and provides insight into *how* and *why* integrated learning creates economic value.

Conceptual model:

Integration of Education → Applicability of knowledge → Innovation → Competitiveness

Research Methodology

This study adopts a quantitative, descriptive-explanatory research design aimed at examining causal relationships among the observed constructs.

The research is based on a quantitative approach, with data collected using a structured survey questionnaire with a five-point Likert scale (1–5). The sample consists of employees from organizations across different sectors, including manufacturing, services, and the public sector.

The research instrument is a structured questionnaire composed of five sections. The first section captures socio-demographic and organizational characteristics of respondents, while the remaining sections measure four key constructs: integration of education, applicability of knowledge, organizational innovativeness, and organizational competitiveness.

A total of 35 items are included in the questionnaire, of which 32 are substantive statements and 3 are reverse-coded items designed to reduce response bias. All constructs are operationalized in accordance with the conceptual model of the study.

Variables in the study:

- Independent variable: Integration of education
- Mediating variables: Applicability of knowledge and innovation
- Dependent variable: Organizational competitiveness

Respondents' perceptions are measured using multi-item Likert-type scales ranging from 1 (strongly disagree) to 5 (strongly agree).

Table 1 *Research questionnaire proposal*

R.br.	Claim	Construct	Hypothesis	Coding
1	The knowledge gained through formal education is a good foundation for my work.	Integration of education	H1	Direct
2	The organization I work for provides additional training and development programs for employee development.	Integration of education	H1	Direct
3	In my organization, there is an incentive for continuous professional development.	Integration of education	H1	Direct
4	Employees learn from each other through daily work and collaboration.	Integration of education	H1	Direct
5	Practical experience is used to improve the knowledge and skills of employees.	Integration of education	H1	Direct
6	In my organization, formal, non-formal and informal learning are interconnected.	Integration of education	H1	Direct
7	The knowledge gained through various forms of learning is complemented within the framework of my work.	Integration of education	H1	Direct

8	Management recognizes the importance of all forms of education for the development of employees.	Integration of education	H1	Direct
9	I can use the knowledge I have to successfully solve specific tasks.	Applicability of knowledge	H1, H2	Direct
10	The education and training I have undergone have an immediate benefit for my business.	Applicability of knowledge	H1, H2	Direct
11	I can easily connect theoretical knowledge with the practical requirements of the workplace.	Applicability of knowledge	H1, H2	Direct
12	In my daily work, I use the knowledge gained through formal education.	Applicability of knowledge	H1, H2	Direct
13	In my daily work, I use the knowledge gained through trainings, seminars and workshops.	Applicability of knowledge	H1, H2	Direct
14	Experiential learning in the workplace contributes significantly to my work performance.	Applicability of knowledge	H1, H2	Direct
15	I believe that the knowledge of employees in my organization has a clear practical value.	Applicability of knowledge	H1, H2	Direct
16	The organization successfully converts the individual knowledge of employees into work results.	Applicability of knowledge	H1, H2	Direct
17	I'm encouraged to come up with new ideas.	Innovativeness	H2, H3	Direct
18	Employees have the opportunity to improve existing work processes.	Innovativeness	H2, H3	Direct
19	The organization supports experimentation and the introduction of new solutions.	Innovativeness	H2, H3	Direct
20	New knowledge is used to improve products or services.	Innovativeness	H2, H3	Direct
21	The organization responds quickly to change.	Innovativeness	H2, H3	Direct
22	There is an openness to learning from mistakes in the organization.	Innovativeness	H2, H3	Direct
23	Collaboration between employees contributes to the emergence of new ideas.	Innovativeness	H2, H3	Direct
24	I believe that my organization is more innovative than most similar organizations.	Innovativeness	H2, H3	Direct
25	My organization successfully responds to changes in the environment.	Competitiveness	H3	Direct
26	The organization I work for has a good market or institutional position.	Competitiveness	H3	Direct
27	Employee knowledge is an important source of my organization's strengths.	Competitiveness	H3	Direct
28	The organization utilizes its human resources efficiently.	Competitiveness	H3	Direct
29	Compared to our competitors, my organization is successfully adapting to new requirements.	Competitiveness	H3	Direct

30	The organization achieves results that confirm its success and sustainability.	Competitiveness	H3	Direct
31	Continuous learning of employees contributes to a better position of the organization.	Competitiveness	H3	Direct
32	I believe that employee education contributes to the long-term competitiveness of the organization.	Competitiveness	H3	Direct
33	In my organization, the knowledge gained through education rarely has practical application.	Applicability of knowledge	H1, H2	Reverse-coded
34	Employees mostly rely only on previous education, with no additional learning.	Integration of education	H1	Reverse-coded
35	New knowledge and ideas are difficult to find application in my organization.	Innovativeness	H2, H3	Reverse-coded

The reliability of the measuring scales will be tested using the Cronbach alpha coefficient, while the construct validity will be verified by factor analysis.

In order to reduce the bias of the responses, the questionnaire includes reversely formulated statements.

Operationalization of Variables

To enable empirical testing of the proposed model, key constructs are operationalized as follows:

- Integration of education: Measured through the perceived interconnectedness of formal, non-formal, and informal learning (e.g., existence of training systems, mentoring practices, and knowledge-sharing mechanisms).
- Applicability of knowledge: Measured by employees' ability to apply acquired knowledge to solve specific work-related problems.
- Organizational innovativeness: Measured by the frequency of idea generation, as well as process and product improvements.
- Organizational competitiveness: Measured through perceptions of market position, operational efficiency, and adaptability to environmental changes.

Advanced Data Analysis

Data analysis will be conducted in two stages.

The first stage involves Confirmatory Factor Analysis (CFA) to assess the validity and reliability of the measurement scales, including indicators such as Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE).

The second stage involves evaluating the structural model using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach. Given the planned sample size (N = 100), PLS-SEM is considered appropriate due to its robustness in analyzing complex models and its suitability for smaller samples.

Sample

The study is conducted on a sample of employees from organizations operating in different sectors (manufacturing, services, and public sector). The target sample size is a minimum of 100 respondents to ensure adequate statistical validity.

The sample structure includes:

- Different levels of management
- Employees with varying levels of education
- Organizations of different sizes

Data are collected through an online questionnaire (e.g., Google Forms), with voluntary and anonymous participation.

Data Analysis Methods

The collected data will be analyzed using the following methods:

- Descriptive statistics
- Reliability analysis (Cronbach's alpha)
- Correlation analysis
- Multiple regression analysis

To examine more complex relationships among variables, Structural Equation Modeling (SEM) will be applied.

Discussion

A particularly important aspect of this problem is reflected in the discrepancy between the level of knowledge and economic development. Empirical data suggest that a high level of formal education does not necessarily lead to economic prosperity if there is no adequate institutional and organizational infrastructure for the application of knowledge (World Economic Forum, 2020).

Contemporary research confirms that innovation is a key intermediary mechanism between knowledge management and organizational performance, further emphasizing the importance of integrating education and knowledge in organizations (Cristache et al., 2025).

In this context, digital transformation and the application of artificial intelligence are becoming key factors in improving knowledge management and the competitiveness of organizations (Cantu-Ortiz, 2021).

This gap reinforces the argument that knowledge without application lacks full value (Davenport & Prusak, 1998), while organizational systems and institutional framework play a key role in its transformation into economic value (Teece, 2007).

The results are consistent with the theory of dynamic capabilities, according to which competitiveness arises from an organization's ability to integrate and transform resources (Teece, 2007).

Viewed through the set model, the results indicate that the integration of educational processes is the basis for the development of applicable knowledge (H1), which further affects the innovativeness of the organization (H2), and indirectly competitiveness (H3). Such a chain of relationships confirms theoretical assumptions about the role of knowledge as a key resource in modern organizations.

The obtained conceptual relationships indicate that the applicability of knowledge is a key intermediary mechanism between education and organizational performance.

Organizations that want to increase competitiveness should develop integrated learning models through the systematic integration of formal education programs, continuous training and informal knowledge exchange processes, with the active support of management and the development of a learning-based organizational culture.

Conclusion

Corporate education represents a key mechanism for transforming knowledge into a sustainable competitive advantage in modern organizations. The findings of the theoretical analysis and the proposed conceptual model indicate that the integration of formal, non-formal, and informal education enables the development of applicable knowledge, which serves as a foundation for innovation and long-term competitiveness.

The primary scientific contribution of this study lies in the conceptualization of an integrated education model that links different forms of learning with critical organizational outcomes—namely, knowledge applicability, innovation, and competitiveness.

From a practical perspective, the results suggest that organizations should adopt a systemic approach to employee education by:

- Integrating diverse forms of learning
- Developing a knowledge-based organizational culture
- Enhancing knowledge transfer mechanisms

The limitations of the study primarily relate to the conceptual nature of the proposed model and the need for its empirical validation using representative samples.

The findings indicate that the key to organizational competitiveness is not the accumulation of knowledge itself, but its effective integration and application. This underscores the necessity of redefining educational approaches within the corporate context.

The broader value of this study lies in its role as a foundational research framework that extends beyond theoretical analysis and provides a basis for future empirical investigations. The proposed model and research instrument offer a platform for testing in real organizational environments.

Furthermore, the study is conceived as a starting point for a broader research and development initiative that would bring together key stakeholders from academia, the corporate sector, and public institutions. The objectives of such an initiative include:

- Empirical validation of the proposed model
- Identification of best practices in corporate education
- Development of practical solutions for improving employee education systems

In this sense, the paper has not only scientific relevance but also strategic and developmental significance, as it establishes a foundation for an integrated approach to education as a key driver of competitiveness in modern organizations.

Conflict of interests

The authors declare no conflict of interest.

References

Alavi, M., & Leidner, D. E. (2001). Review: Knowledge management and knowledge management systems. MIS Quarterly, 25(1), 107–136.

Aljuwaiber, A. (2026). An Integrative Systematic Review of Knowledge Management, Organizational Performance, and Business Sustainability. Administrative Sciences, 16(4), 185. https://doi.org/10.3390/admsci16040185

American Psychological Association. (2020). Publication manual of the American Psychological Association (7th ed.). https://doi.org/10.1037/0000165-000

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. Psychological Bulletin, 103(3), 411–423.

Argyris, C., & Schön, D. (1978). Organizational learning. Addison-Wesley.

Becker, G. S. (1993). Human capital: A theoretical and empirical analysis with special reference to education (3rd ed.). University of Chicago Press.

Cantu-Ortiz, F. J. (2021). Knowledge management and artificial intelligence analytics: A bibliometric study of research trends. In F. J. Cantu-Ortiz (Ed.), A research agenda for knowledge management and analytics (pp. 67–88). Edward Elgar Publishing.

Cristache, N., Croitoru, G., & Florea, N. V. (2025). The influence of knowledge management on innovation and organizational performance. Journal of Innovation & Knowledge.

Davenport, T. H., & Prusak, L. (1998). Working knowledge: How organizations manage what they know. Harvard Business School Press.

Edvinsson, L., & Malone, M. S. (1997). Intellectual capital. Harper Business.

Garavan, T. N., Carbery, R., & Rock, A. (2012). Mapping talent development: Definition, scope and architecture. European Journal of Training and Development, 36(1), 5–24.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). Multivariate data analysis (8th ed.). Cengage Learning.

Kline, R. B. (2023). Principles and practice of structural equation modeling (5th ed.). Guilford Press.

Comenius, J. A. (2007). Didactica Magna. A scientific book.

Marsick, V. J., & Watkins, K. E. (2001). Informal and incidental learning. New Directions for Adult and Continuing Education, 89, 25–34.

Mašić, B., & Tot, V. (2012). Principles of Management. Univerzitet Educons.

Nonaka, I., & Takeuchi, H. (1995). The knowledge-creating company. Oxford University Press.

Polanyi, M. (1966). The tacit dimension. Routledge.

Savić Tot, T., Runić Ristić, M., Tot V., (2022): Employee satisfaction as an element of Quality of Work Life-Research results, International Journal for Quality Research 16(2):329-351 https://doi.org/10.24874/IJQR16.02-02

Senge, P. M. (1990). The fifth discipline: The art and practice of the learning organization. Doubleday.

Stewart, T. A. (1997). Intellectual capital: The new wealth of organizations. Doubleday.

Teece, D. J. (2007). Explicating dynamic capabilities. Strategic Management Journal, 28(13), 1319–1350.

Tot, V. (2007). Intellectual Capital of Strategic Processes of Industrial Systems (doctoral dissertation). Faculty of Technical Sciences, Novi Sad.

World Economic Forum. (2020). The future of jobs report 2020.