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Obsah

Contents

Box approach for immersive marketing of educational services in the context of educational reforms	147
Nadiia Artyukhova	
Implementation of educational reforms: socioeconomic context.....	156
Nadiia Artyukhova, Artem Artyukhov, Olena Churikanova, Kseniia Bliumska-Danko	
Selected aspects of preferences and level of knowledge of tourism students in the field of gastronomy	164
Radúz Dula – Roman Lacko	
Inovácie v marketingovej stratégií pre drevostavby - úloha digitálneho a zeleného marketingu	176
Markéte Šeda – Sabina Janikovičová – František Pollák	
The current level of digitalization of small, medium and large enterprises in Slovakia and Ukraine	184
Yuliia Yehorova	

Box approach for immersive marketing of educational services in the context of educational reforms¹

Nadiia Artyukhova²

Abstract

In the rapidly evolving landscape of higher education, universities navigate a dynamic intersection between academia and market forces. The imperative to promote and sustain educational and scientific activities has never been more crucial. Traditionally as bastions of knowledge dissemination, Universities are now compelled to adopt strategic marketing approaches to thrive in an environment characterized by heightened competition and evolving stakeholder expectations. This article delves into the multifaceted realm of marketing within the university setting, shedding light on the principal determinants that shape the success and impact of such endeavors. This article explores the application of the box model (white, gray, and black box) in the context of immersive marketing for educational products. We argue that this system's dynamic and evolving nature necessitates a clear understanding of its internal workings. The paper highlights the advantages and limitations of each box approach and proposes the white box model as the most suitable for the immersive marketing of educational products. The white box approach offers transparency and interpretability, fostering trust, customization, and continuous improvement. The visibility afforded by the white box approach enables ongoing monitoring, testing, and optimization of the marketing system, leading to better educational outcomes. Finally, it promotes accountability and responsible use of technology by exposing potential biases and ethical considerations. The article outlines the key parameters of the "immersive marketing of educational products" system. This comprehensive framework provides valuable insights for educational institutions seeking to leverage immersive technologies for the effective marketing of educational products.

Key words

Marketing, University, Educational Products, Box Approach.

JEL Classification: H52, M31, M38

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Introduction

Like any complex system, educational marketing can be conceptualized through the lens of technical systems. This analogy allows us to understand the intricate workings of educational marketing and identify key components, processes, and potential areas for optimization.

¹ The article was elaborated within the EU project "Immersive Marketing in Education: Model Testing and Consumers' Behavior" (No. 09I03-03-V04-00522/2024/VA) and a project from the Ministry of Education and Science of Ukraine under project "Modeling and forecasting of socio-economic consequences of higher education and science reforms in wartime" (reg. n. 0124U000545).

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Marketing often draws analogies from technical systems to help describe and conceptualize various marketing processes and phenomena. Here are some examples of technical system concepts that can be applied in marketing:

1. Feedback loops:
 - concept from control theory and cybernetics;
 - describes the cyclical process of gathering customer feedback, analyzing it, and using it to improve products/services.
2. Network effects:
 - concept from network theory;
 - describes how the value of a product or service increases as more users join the network.
3. Queuing theory:
 - concept from operations research;
 - analyzes wait times and bottlenecks in customer service or sales processes;
4. Decision trees:
 - graphical models from computer science and information theory;
 - uses to visualize and optimize complex marketing decision-making processes.
5. A/B testing:
 - concept from experimental design;
 - compares the performance of two or more marketing variations to identify the most effective approach.
6. Simulation modeling:
 - technique from systems engineering;
 - creates virtual models to test and optimize marketing strategies before real-world implementation.
7. Data mining:
 - concept from computer science and statistics;
 - applies advanced analytical techniques to uncover hidden patterns and insights in marketing data.

LLM Gemini (<https://gemini.google.com/>) on the prompt "What analogies with technical systems are used in marketing? Write me specific methods of describing technical systems (with names) that can be used in marketing" gives some additional specific examples of technical systems analogies in marketing:

- "marketing funnel as a pipeline: visualizing the customer journey as a funnel, from awareness to conversion;
- brand as a product: treating a brand with specific features, benefits, and positioning;
- customer relationship management (CRM) as a database system: CRM software is used to store and manage customer data;
- digital marketing as a network: understanding the interconnectedness of various digital channels (e.g., social media, email, SEO);

- marketing analytics as data science: Using data mining and statistical analysis to extract insights from marketing data."

By drawing on these technical system concepts, marketers can develop more robust, data-driven, and systems-oriented approaches to understanding and improving their marketing efforts. The analogies help translate complex ideas into more tangible and actionable marketing strategies.

The list mentioned above of analogies needs one more important component. This is the box model, which is successfully used to describe material systems. The box approach encompasses black, gray, and white box methodologies and is a critical framework in various fields such as computer science, software testing, machine learning, and bioinformatics. Each approach offers distinct advantages and limitations, influencing their application in different contexts.

White Box Approach.

The white box approach is characterized by its transparency, allowing for complete visibility into the internal workings of a system. This observation is particularly beneficial in fields such as machine learning and software testing, where understanding the decision-making process is crucial. For instance, in Intrusion Detection Systems (IDS), the white box approach facilitates the interpretation of model predictions, thereby assisting cybersecurity teams in making informed decisions (Neupane et al., 2022). Similarly, white box machine learning models in medical applications can elucidate the relationships between variables, which is essential for clinical decision-making (Rieg et al., 2020). The white box model is also favored in biological contexts, as it enables researchers to analyze underlying mechanisms effectively (Liu & Wang, 2022).

Black Box Approach.

In contrast, the black box approach operates without revealing the system's internal mechanisms. This method is often employed when the complexity of the model renders it impractical to understand its inner workings. For example, in software testing, black box techniques focus on the outputs generated from given inputs, making them universally applicable across various programming languages and systems (Corradini et al., 2022). In machine learning, black box models, such as neural networks, can achieve high accuracy but often lack interpretability, which raises concerns in high-stakes environments (Loyola-González, 2019). The black box approach is also prevalent in bioinformatics, where complex models predict biological outcomes without disclosing the underlying processes (Lo-Thong et al., 2020).

Gray Box Approach.

The gray box approach is a hybrid between the white and black box methodologies, combining elements of both. This approach is handy in scenarios where partial knowledge of the system is available. For instance, gray box techniques leverage the software's internal structure and external behavior in software testing, allowing for more effective testing strategies (Baharom & Shukur, 2011). In bioinformatics, gray box models can integrate empirical data with theoretical frameworks, enhancing the predictive capabilities of metabolic pathway analyses (Lo-Thong et al., 2020). This approach is also applied in marine biology, where gray box models predict the effects of biofouling on ship performance by integrating empirical data with theoretical models (De Haas et al., 2023).

The choice between black, gray, and white box approaches depends on the specific requirements of the task at hand. White box models are preferred for their interpretability

and transparency, making them suitable for applications requiring detailed understanding. Black box models excel in complexity and performance but may sacrifice interpretability, a significant drawback in critical applications. Gray box models offer a balanced solution, utilizing empirical and theoretical insights to enhance predictive accuracy.

The article's objective is the applied use of the box model in the immersive marketing of educational services (products).

1 Methodology

Implementing the box approach in the context of metaverse and immersive marketing (in general) presents significant opportunities and challenges for marketers. Each approach offers distinct advantages that can enhance consumer engagement, brand interaction, and overall marketing effectiveness in immersive environments.

White Box Approach.

The white box approach emphasizes transparency and interpretability, which can be particularly beneficial in the metaverse. Through the white box model, marketers can gain insights into consumer behavior and preferences through precise data analytics and feedback mechanisms. This approach allows for developing targeted marketing strategies informed by explicit consumer data, leading to more personalized experiences (Dwivedi et al., 2022). For instance, brands can analyze user interactions within the metaverse to understand how different elements of their marketing campaigns resonate with consumers, thereby refining their strategies in real-time (Rejeb et al., 2023). Furthermore, the transparency offered by white box models can enhance consumer trust, as users are more likely to engage with brands that demonstrate transparent and ethical use of their data (Dwivedi et al., 2022).

Black Box Approach.

In contrast, the black box approach focuses on the outputs of marketing strategies without revealing the internal processes that lead to those outcomes. This methodology is particularly relevant in the metaverse, where complex algorithms can analyze vast user data to optimize marketing efforts (Dwivedi et al., 2022). For example, black box models can be employed to predict consumer behavior based on immersive experiences, such as virtual reality (VR) interactions or augmented reality (AR) advertisements (Huckle et al., 2024). While this approach can yield high engagement and conversion levels, it poses challenges regarding transparency and accountability. Marketers may need help to justify their strategies to stakeholders when the underlying processes remain opaque, potentially leading to ethical concerns regarding consumer data usage (Dwivedi et al., 2022).

Gray Box Approach.

The gray box approach combines elements of both white and black box methodologies, allowing marketers to leverage the strengths of both strategies. This hybrid approach is applicable in the metaverse, where marketers can utilize empirical data and predictive analytics to enhance consumer experiences (Alfaro et al., 2021). For instance, gray box models can facilitate the integration of user feedback with advanced algorithms to create more engaging and relevant marketing campaigns (Dwivedi et al., 2022). This approach can also enable marketers to adapt their strategies dynamically based on real-time data, enhancing the overall effectiveness of their marketing efforts in immersive environments (Rejeb et al., 2023). Combining transparency with predictive power, the gray box approach can foster

deeper consumer relationships and drive brand loyalty in the metaverse (Dwivedi et al., 2022).

2 Results and Discussion

Using a white, black, or gray box approach to model the "immersive marketing of educational products" system depends on the key criteria below.

Transparency and Understanding.

The primary consideration is the desired level of transparency and understanding of the system's inner workings. A white box approach provides complete visibility and insight into the system's parameters, decision-making processes, and underlying logic. This fact can foster trust, enable customization, and support continuous improvement. In contrast, a black box approach keeps the system's details opaque, while a gray box offers partial transparency.

Stakeholder Involvement.

Another important factor is the level of stakeholder involvement, particularly from educators, instructional designers, and learners. A white box approach allows for greater collaboration and input from these stakeholders, as they can directly shape the immersive experiences. Black box systems limit this involvement, while gray box models enable some degree of stakeholder participation.

Complexity and Uncertainty.

The complexity of the system and the level of uncertainty involved also play a role. Simple, well-understood systems may be effectively modeled using a black box approach. However, more complex, dynamic, or uncertain educational environments may benefit from the adaptability and continuous improvement enabled by a white box approach.

Ethical Considerations.

Immersive marketing in education raises ethical concerns related to data privacy, algorithmic bias, and the responsible use of technology. A white box model can better address these issues by promoting transparency, accountability, and alignment with the institution's values.

Technological Capabilities.

The educational institution's available technological capabilities and resources can also influence the choice of box type. A white box approach may require more advanced technical expertise and infrastructure, while a black box system can leverage off-the-shelf solutions with less customization.

The white box approach is generally considered better for the immersive marketing of educational products for a few key reasons. The white box approach enables greater customization and adaptability, as the immersive marketing system's parameters and logic can be more easily modified and fine-tuned to suit the specific needs and preferences of the educational institution and its learners. Educators and instructional designers can provide direct input and feedback to shape the immersive experiences, ensuring they align with pedagogical best practices and learning objectives. This adaptability allows immersive marketing to evolve alongside the changing needs of the educational ecosystem.

Moreover, the visibility and understanding afforded by the white box approach facilitate ongoing monitoring, testing, and optimization of the immersive marketing system. Marketers can analyze the performance data, identify areas for improvement, and make targeted adjustments to enhance the effectiveness and impact of the immersive experiences. This iterative process supports continuously enhancing immersive marketing strategies, leading to better outcomes for learners and the educational institution.

Finally, the white box approach promotes accountability and responsible use of immersive technologies in education. By exposing the system's inner workings, potential biases, privacy concerns, and ethical implications can be more readily identified and addressed. This level of transparency can help build trust and ensure that immersive marketing aligns with the educational institution's values and ethical standards.

So, for the dynamic system "immersive marketing of educational products," we have the parameters listed below.

1. X - input parameters:
 - learner demographics (age, education level, interests, educational needs, and preferences);
 - learner needs and pain points;
 - preferred learning modalities (visual, auditory, kinesthetic);
 - accessibility requirements;
 - technological literacy levels;
 - educational content (course materials, syllabi, and learning objectives);
 - technological infrastructure (VR/AR hardware, software, and network capabilities);
 - budget (financial resources allocated for marketing and development).
2. U - control parameters:
 - immersive technology selection (VR, AR, mixed reality);
 - immersive content and experience design;
 - engagement strategies (gamification, storytelling);
 - channels for immersive marketing (simulations, virtual events, augmented reality experiences, interactive demos);
 - promotional tactics (social media, influencer marketing);
 - marketing strategies (digital marketing campaigns, social media, content marketing, and public relations);
 - user interface design (user-friendly interfaces for VR/AR applications);
 - pricing strategies (tuition fees, discounts, and financial aid options).
3. K - system parameters:
 - institutional resources (budget, campus facilities, technology infrastructure, learning spaces, technical expertise);
 - existing educational content and curricula;
 - institutional brand and reputation;
 - competitive landscape of educational providers;
 - industry regulations and accreditation requirements;
 - faculty expertise (qualifications and experience of the teaching staff);
 - organizational culture (the institution's values, mission, and vision).

4. Z - disturbing parameters:

- technological limitations (hardware, software, internet connectivity);
- user acceptance and adoption barriers;
- cybersecurity and privacy concerns;
- economic factors (economic downturns, inflation, and unemployment rates);
- societal perceptions of immersive technology in education;
- technological advancements (rapid changes in technology and emerging trends);
- competitive landscape (actions and strategies of competing institutions);
- regulatory environment (government policies and regulations affecting higher education).

5. Y - output parameters:

- enrollment and registration rates;
- student engagement and satisfaction levels;
- learning outcomes and academic performance;
- brand awareness and reputation;
- return on investment (ROI) for immersive marketing efforts;
- competitive positioning and market share.

Conclusion

The analysis of immersive marketing in the context of educational services reveals a powerful tool for enhancing learning experiences. By leveraging virtual and augmented reality technologies, educational institutions can create engaging and interactive environments that captivate students and promote more profound understanding.

A key finding is the importance of a white box approach to immersive marketing. This approach prioritizes transparency, customization, and continuous improvement, ensuring the marketing strategies align with the institution's values and goals. By understanding the internal workings of the immersive marketing system, educators and marketers can make data-driven decisions, tailor experiences to individual needs, and optimize the overall impact of these technologies.

While the white box approach offers several advantages for modeling the "immersive marketing of educational products" system, there are also some potential disadvantages to consider:

1. Increased complexity.

The white box approach requires a deeper understanding of the system's inner workings, parameters, and decision-making logic. This can make the modeling process more complex and time-consuming, especially for educational institutions with limited technical expertise.

2. Higher resource requirements.

Implementing and maintaining a white box system may require more resources, both in terms of financial investment and specialized human capital. The need for advanced technological capabilities, data management, and continuous optimization can increase the overall cost and resource burden.

3. Potential for overwhelming detail.

The level of transparency and visibility provided by the white box approach can sometimes lead to overwhelming information and data, making it challenging for stakeholders to navigate and interpret the system effectively.

4. Increased maintenance efforts.

Keeping the white box system up-to-date and adapting it to changing educational needs and regulations may require more ongoing maintenance and adjustments compared to a more rigid, black box approach.

5. Security and privacy concerns:

While the white box approach can address some ethical considerations, the increased transparency may also raise concerns about data security and privacy, as the system's inner workings are more exposed.

6. Resistance to change.

Some stakeholders, especially those unfamiliar with or resistant to new technologies, may be hesitant to embrace a white box approach, preferring the perceived simplicity and familiarity of a more traditional black box system.

7. Potential for misunderstanding.

Even with the increased transparency, there is a risk that stakeholders may need to be more accurate and understand the system's underlying logic and decision-making processes, leading to incorrect assumptions or unrealistic expectations.

To mitigate these disadvantages, educational institutions may need to invest in robust change management strategies, provide comprehensive training and support for stakeholders, and carefully balance the level of transparency with the need for simplicity and ease of use. A hybrid approach combining white, black, and gray box modeling elements may be a more practical solution in certain cases.

References

- Alfaro, L., Rivera, C., Luna-Urquizo, J., Castañeda, E., Zúñiga-Cueva, J., & Fialho, F. (2021). Hotels adaptative e-marketing model using learning styles and virtual reality. 19th International Conference e-Society, 209-2016. https://doi.org/10.33965/es2021_2021011026
- Baharom, S. & Shukur, Z. (2011). An experimental assessment of module documentation-based testing. *Information and Software Technology*, 53(7), 747-760. <https://doi.org/10.1016/j.infsof.2011.01.005>
- Corradini, D., Zampieri, A., Pasqua, M., Viglianisi, E., Dallago, M., & Ceccato, M. (2022). Automated black-box testing of nominal and error scenarios in restful apis. *Software Testing Verification and Reliability*, 32(5). <https://doi.org/10.1002/stvr.1808>

- De Haas, M., Coraddu, A., El Mouhandiz, A.-A., Dimitra Charisi, N., & A. Kana, A. (2023). Power Increase due to Marine Biofouling: a Grey-box Model Approach. Modelling and Optimisation of Ship Energy Systems (MOSES-2023). <https://doi.org/10.59490/moses.2023.661>
- Dwivedi, Y., Hughes, L., Wang, Y., Alalwan, A., Ahn, S., Balakrishnan, J., ... & Wirtz, J. (2023). Metaverse marketing: how the metaverse will shape the future of consumer research and practice. *Psychology and Marketing*, 40(4), 750-776. <https://doi.org/10.1002/mar.21767>
- Huckle, T., Mummert, K., Lyons, A., McCreanor, T., McLellan, G., & Moewaka Barnes, H. (2024). New immersive alcohol marketing and commerce in metaverse environments. *Drug and Alcohol Review*. <https://doi.org/10.1111/dar.13967>
- Liu, G. & Wang, J. (2022). Eegg: an analytic brain-computer interface algorithm. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 30, 643-655. <https://doi.org/10.1109/tnsre.2022.3149654>
- Lo-Thong, O., Charton, P., Cadet, X., Grondin-Pérez, B., Saavedra, E., Damour, C., & Cadet, F. (2020). Identification of flux checkpoints in a metabolic pathway through white-box, grey-box and black-box modeling approaches. *Scientific Reports*, 10(1), 13446. <https://doi.org/10.1038/s41598-020-70295-5>
- Loyola-González, O. (2019). Black-box vs. white-box: understanding their advantages and weaknesses from a practical point of view. *IEEE Access*, 7, 154096-154113. <https://doi.org/10.1109/access.2019.2949286>
- Neupane, S., Ables, J., Anderson, W., Mittal, S., Rahimi, S., & Banicescu, I. (2022). Explainable intrusion detection systems (X-IDS): a survey of current methods, challenges, and opportunities. *IEEE Access*, 10, 112392-112415. <https://doi.org/10.1109/access.2022.3216617>
- Rejeb, A., Rejeb, K., & Treiblmaier, H. (2023). Mapping metaverse research: identifying future research areas based on bibliometric and topic modeling techniques. *Information*, 14(7), 356. <https://doi.org/10.3390/info14070356>
- Rieg, T., Frick, J., Baumgartl, H., & Buettner, R. (2020). Demonstration of the potential of white-box machine learning approaches to gain insights from cardiovascular disease electrocardiograms. *Plos One*, 15(12), e0243615. <https://doi.org/10.1371/journal.pone.0243615>

Implementation of educational reforms: socioeconomic context¹

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Abstract

The study analyzes the most cited works on educational reform to identify key trends shaping the field. The findings reveal a growing emphasis on the connection between education and economic growth, particularly through human capital development. Additionally, there is a strong focus on evidence-based policy-making and research practices, with researchers increasingly using case studies to inform educational development and policy decisions. Technology integration into education is another significant trend, with the prominence of e-learning, artificial intelligence, and information management topics. The study also highlights the importance of practitioner-oriented research, interdisciplinary collaboration, equity and inclusion, global education, and lifelong learning. Researchers, policymakers, and educators can work together to create more equitable, inclusive, and sustainable education systems by understanding these trends.

Key words

Quality of Education, University, Education and Science, Educational Reforms

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Introduction and background

The implementation of educational reforms is significantly influenced by the socioeconomic context within which these reforms are situated. Various studies have explored how historical, political, and economic factors shape educational policies and their outcomes. This background synthesizes findings from multiple sources to provide a comprehensive understanding of the socioeconomic context of educational reforms.

Historical and Political Context.

Educational reforms cannot be divorced from their historical and political contexts. For instance, Berkovich highlights the influence of neoliberal governance on educational reforms in Israel, indicating that political, social, and economic elements shape the roles of school

¹ The article was elaborated within the EU project "Immersive Marketing in Education: Model Testing and Consumers' Behavior" (No. 09I03-03-V04-00522/2024/VA) and a project from the Ministry of Education and Science of Ukraine under project "Modeling and forecasting of socio-economic consequences of higher education and science reforms in wartime" (reg. n. 0124U000545).

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principals and their training (Berkovich, 2014). Similarly, Denny critiques the failure of West Indian education reforms to consider historical contexts, arguing that ignoring these factors leads to ineffective policy solutions (Denny, 2021). The historical trajectory of educational policies often reflects broader socio-political changes, as seen in Sweden, where societal shifts since the 1990s have prompted significant educational reforms (Cabau, 2009). In Chile, the decentralization of education under military rule resulted in increased educational inequities, which persisted despite subsequent reforms (Webb & Radcliffe, 2013). This fact illustrates how historical injustices can continue to affect educational access and quality. The implications of the Cold War on educational curricula also demonstrate how political contexts can shape educational reforms over time (Topolovčan & Dubovicki, 2019).

Economic Influences.

Economic factors play a crucial role in shaping educational reforms. In Singapore, the "Thinking Schools, Learning Nation" initiative responds to global economic demands, emphasizing the need for educational outcomes catering to diverse talents and skills (Sharpe & Gopinathan, 2002). This aligns with findings from Mnguni and Mokiwa, who argue that STEM education reforms are driven by socioeconomic imperatives to promote social justice and prepare learners for future challenges (Mnguni & Mokiwa, 2020). The relationship between education and economic development is further evidenced in Ghana's case, where teacher education reforms were influenced by external funding and global educational trends, often neglecting local contexts (Adu-Gyamfi & Otami, 2020). In China, the "Made In China 2025" initiative illustrates how national economic goals are closely tied to educational reforms, emphasizing entrepreneurship education as a response to changing economic landscapes (Wu & Benson, 2016).

Social Inequalities and Access.

Educational reforms often aim to address social inequalities, yet existing socioeconomic disparities can limit their effectiveness. Lavrijsen and Nicaise provide empirical evidence that educational tracking can exacerbate social inequalities in academic achievement, indicating that the design of educational systems is intertwined with broader socioeconomic contexts (Lavrijsen & Nicaise, 2015). Similarly, Sawiński's analysis of Poland's educational reforms reveals that social stratification influences student outcomes despite efforts to equalize educational opportunities (Sawiński, 2017). The impact of educational reforms on labor market outcomes is also significant. Alzua et al. demonstrate that Argentina's Ley Federal de Educación positively affected high school graduation rates, yet the benefits were unevenly distributed across socioeconomic groups (Alzua et al., 2015). This highlights the need for reforms to be sensitive to the socioeconomic contexts in which they are implemented.

Globalization and Neoliberalism.

The influence of globalization and neoliberal ideologies on educational reforms is a recurring theme in the literature. Carter and Dediwalage argue that the pressures of globalization necessitate educational reforms that align with market demands, often leading to a commodification of education (Carter & Dediwalage, 2010). In Saudi Arabia, the Tatweer education reforms were framed within a neoliberal context, aiming to produce a workforce that could contribute to national economic goals (Tayan, 2017). Furthermore, integrating online teaching in STEM education to respond to the COVID-19 pandemic illustrates how global crises can accelerate educational reforms driven by socioeconomic and technological imperatives (Mnguni & Mokiwa, 2020).

The socioeconomic context is a critical determinant of the success and sustainability of educational reforms. Historical, political, and economic factors influence educational policies,

often with significant social equity and access implications. Understanding these socio-economic contexts will be essential for developing effective and inclusive educational reforms as educational systems evolve in response to global challenges.

1 Methodology

This paper used bibliometric analysis to analyze the main determinants of educational reforms. The dataset for bibliometric analysis was obtained from the query "education* reform*" from the Scopus database (<https://www.scopus.com/>). Bibliometric analysis tools – VOSviewer (<https://www.vosviewer.com/>) and Scival (<https://www.scival.com/>). The main task of bibliometric analysis is to identify clusters that characterize educational reforms' main determinants.

Total number of articles in dataset: 17996.

Time frame: 2021-2024 (November 19).

Subject area: Social Sciences; Economics, Econometrics, Finance; Business, Management and Accounting; Decision Sciences.

Number of articles for analysis after limitation: 3186.

Total number of keywords: 9679.

Frame of keywords for analysis: top 2% by prominence (204 keywords, number of occurrences not less than 10).

2 Results and Discussion

Analysis of the content of the most cited works for the query "education* reform*" (Figure 1) showed that scientists focus on the following areas of research:

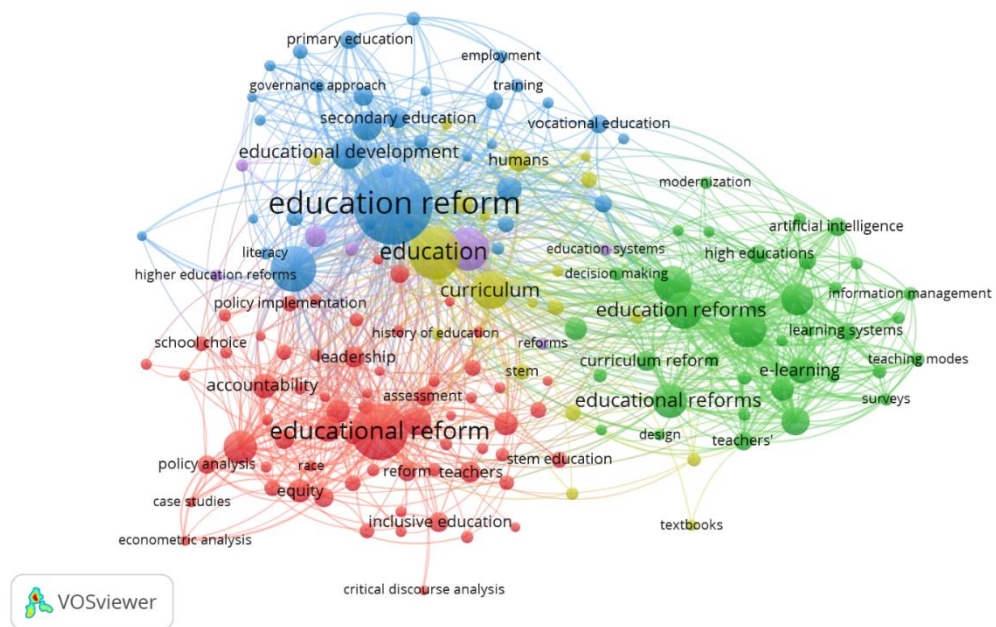
Red Cluster includes terms like "educational reform," "accountability," "equity," "inclusive education," and "case studies" emphasizing policy-oriented aspects of reform and quality of education.

Green Cluster contains terms like "e-learning," "artificial intelligence," and "information management," focusing on modern technologies and teaching methodologies.

Blue Cluster features terms like "educational development," "secondary education," "policy implementation," "innovation," "entrepreneurship," and "research," which reflect technology transfer.

Yellow and Purple Subclusters: smaller groups with terms related to curriculum development and different education issues.

Fig. 1 Bibliometric analysis: keyword map wheel on demand "education* reform*" (database – Scopus, tool – SciVal, 2021-2024)



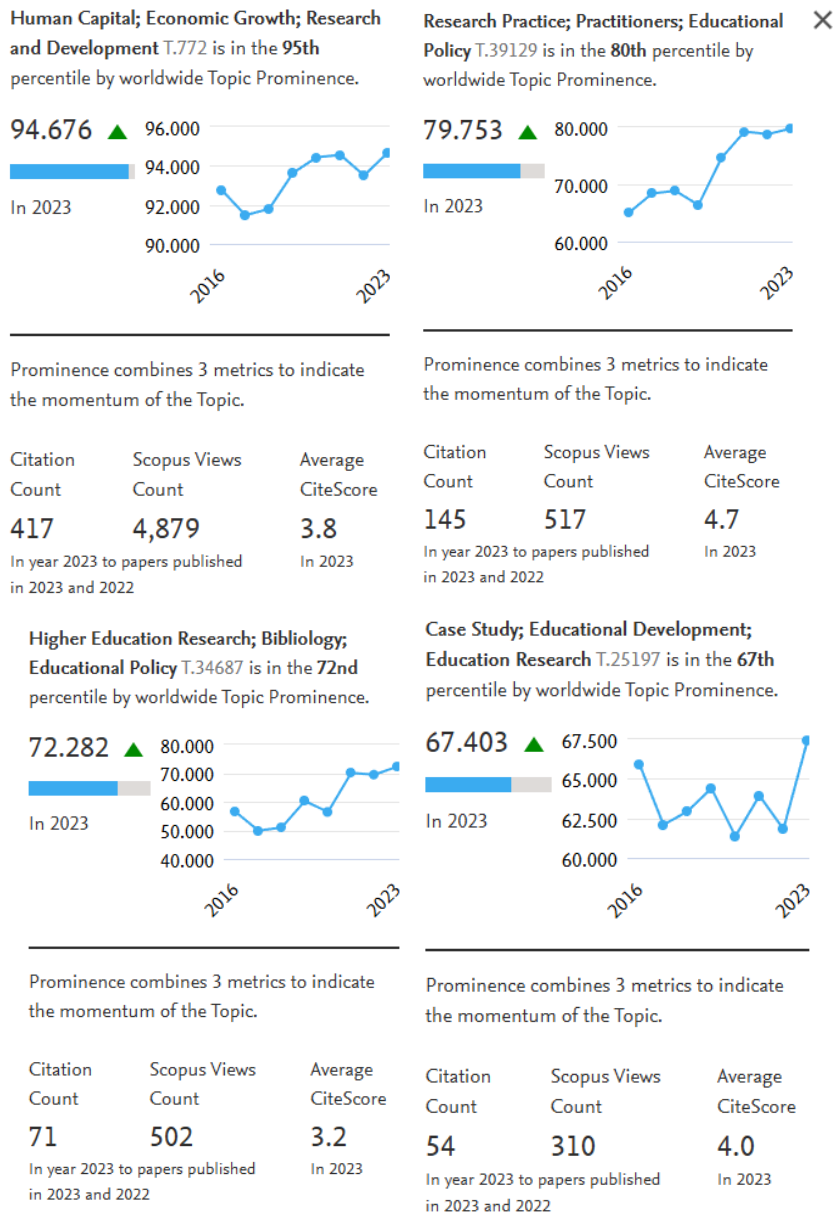
Source: authors' research

Educational and scientific reforms are deeply intertwined, influencing and shaping each other. Scientific advancements often drive educational reforms, as discoveries and technologies necessitate updates in curricula and teaching methods. For instance, the advent of computers and the internet has revolutionized education, leading to the development of online learning platforms and digital textbooks. Conversely, educational reforms can stimulate scientific progress by fostering a new generation of skilled researchers and innovators. A well-educated populace with critical thinking and problem-solving skills can contribute to scientific breakthroughs and technological advancements.

Both educational and scientific reforms share common goals, such as improving quality, promoting innovation, and enhancing societal well-being. Effective educational systems are essential for nurturing future scientists, engineers, and researchers. Countries can cultivate a skilled workforce capable of driving scientific and technological progress by providing quality education. Scientific advancements can inform educational practices, leading to more effective and engaging learning experiences.

So, it's good to know some "scientific" trends in educational reforms (Figure 2).

Fig. 2 Bibliometric analysis: topics on demand "university marketing" (database – Scopus, tool – SciVal, 20121-2024, featured topics)



Some findings from Figure 2 are listed below.

1. Increasing Prominence of "Human Capital and Economic Growth".

This topic has the highest prominence score (94.676) and is in the 95th percentile worldwide.

Its steady upward trajectory reflects growing interest in the relationship between human capital, economic development, and research.

2. Steady Growth in Research Practice and Educational Policy.

Topics like "Research Practice; Practitioners; Educational Policy" consistently grow, reaching the 80th percentile in 2023.

This observation indicates sustained attention to how research informs educational practices and policies globally.

3. Rise of Educational Development through Case Studies.

"Case Study; Educational Development; Education Research" ranks in the 67th percentile, reflecting moderate prominence.

The growing use of case studies in education research signals a trend toward localized, real-world applications of educational theories and practices.

4. Expanding Interest in Higher Education Policy and Bibliology.

Topics in "Higher Education Research; Bibliology; Educational Policy" are now in the 72nd percentile of prominence, highlighting increasing focus on how higher education policies are shaped and measured.

The growing CiteScore (3.2) suggests the quality of publications in this area is also improving.

5. Emphasis on the Connection Between Education and Technology.

The prominence of topics such as "Human Capital" is indirectly linked to adopting technology and innovation, indicating that digital tools, e-learning, and technological advancements shape how education supports economic growth.

6. High Impact of Human Capital Research.

With 417 citations and nearly 4,900 Scopus views, "Human Capital; Economic Growth" demonstrates how this area dominates regarding readership and citations.

It underscores a trend of prioritizing research that links education to broader socioeconomic benefits.

7. Growing Focus on Practitioner-Oriented Education Research.

"Research Practice; Practitioners; Educational Policy" highlights the increasing relevance of practitioner-focused research, likely driven by the need for actionable strategies to improve educational outcomes.

Its CiteScore of 4.7 is the highest in this dataset, indicating a solid scholarly impact.

These trends highlight a strong movement toward linking education to societal challenges, especially economic growth, technology integration, and evidence-based policy-making. There's also a noticeable push to improve higher education and practitioner-focused research for real-world impact.

Similar studies can be conducted for other key topics, depending on the specifics of educational reforms in the state development plan.

Conclusion

Analyzing the most cited works on educational reform reveals several key trends shaping the field. Firstly, there is a growing emphasis on the connection between education and economic growth, mainly through human capital development. This trend is reflected in the high prominence of human capital and economic growth topics.

Secondly, there is a strong focus on evidence-based policy-making and research practices. Researchers are increasingly using case studies to inform educational development and policy decisions. Additionally, there is a growing interest in higher education policy and the role of research in shaping it.

Thirdly, the integration of technology into education is a significant theme. The prominence of topics related to e-learning, artificial intelligence, and information management highlights the increasing use of technology in teaching and learning.

Also, there is a growing emphasis on practitioner-oriented research. This trend reflects the need for research that is directly applicable to the challenges faced by educators and policymakers. The high citation rate and CiteScore of publications in this area indicate its strong impact on the field.

The analysis reveals a shift towards interdisciplinary research in the field of education. As educational challenges become increasingly complex, researchers find it necessary to draw on knowledge from various disciplines, including psychology, sociology, economics, and computer science. This interdisciplinary approach allows for a more comprehensive understanding of educational issues and the development of innovative solutions.

Another significant trend is the growing focus on equity and inclusion in education. Researchers are increasingly examining issues such as racial, gender, and socioeconomic disparities and exploring strategies to promote equity and inclusion. This focus reflects a growing awareness of the importance of giving all students equal opportunities to succeed.

The globalization of education is another significant trend. As the world becomes increasingly interconnected, there is a growing interest in global education. Researchers are examining issues such as international student mobility, cross-cultural understanding, and the impact of globalization on education systems. This trend highlights the need for education systems to prepare students for a globalized world.

Finally, the importance of lifelong learning is becoming increasingly recognized. The rapid pace of technological and societal change has made it essential for individuals to life lifelong learning. Researchers are exploring innovative approaches to adult education and professional development to meet the needs of a changing workforce.

The analysis suggests that educational reform is evolving rapidly, driven by the need to address complex societal challenges. By understanding these trends, researchers, policymakers, and educators can better position themselves to shape the future of education.

In conclusion, the field of educational reform is undergoing significant transformation. Researchers, policymakers, and educators can work together to create more equitable, inclusive, and sustainable education systems by understanding these trends.

References

- Adu-Gyamfi, K. and Otami, C. (2020). In search of an effective teacher: ghana's move towards achieving sustainable education through teacher education reforms. *International Journal of Higher Education*, 9(4), 216. <https://doi.org/10.5430/ijhe.v9n4p216>
- Alzua, M., Gasparini, L., & Haimovich, F. (2015). Education reform and labor market outcomes: the case of Argentina's Ley Federal de Educación. *Journal of Applied Economics*, 18(1), 21-43. [https://doi.org/10.1016/s1514-0326\(15\)30002-7](https://doi.org/10.1016/s1514-0326(15)30002-7)
- Berkovich, I. (2014). Neoliberal governance and the "new professionalism" of Israeli principals. *Comparative Education Review*, 58(3), 428-456. <https://doi.org/10.1086/676403>
- Cabau, B. (2009). Language-in-education issues: Sweden as a case study. *Educational Studies*, 35(4), 379-389. <https://doi.org/10.1080/03055690802648366>
- Carter, L. & Dediwalage, R. (2010). Globalisation and science education: the case of sustainability by the bay. *Cultural Studies of Science Education*, 5(2), 275-291. <https://doi.org/10.1007/s11422-009-9248-8>
- Denny, S. (2021). Edutocracy: a model of the new west indian plantocracy in Barbados. *Sage Open*, 11(2). <https://doi.org/10.1177/21582440211030278>
- Lavrijsen, J. & Nicaise, I. (2015). New empirical evidence on the effect of educational tracking on social inequalities in reading achievement. *European Educational Research Journal*, 14(3-4), 206-221. <https://doi.org/10.1177/1474904115589039>
- Mnguni, L. & Mokiwa, H. (2020). The integration of online teaching and learning in stem education as a response to the COVID-19 pandemic. *Journal of Baltic Science Education*, 19(6A), 1040-1042. <https://doi.org/10.33225/jbse/20.19.1040>
- Sawiński, Z. (2017). Education reform and inequality: fifteen years of new lower secondary schools in Poland. *Edukacja*, 141(2). <https://doi.org/10.24131/3724.170209>
- Sharpe, L. & Gopinathan, S. (2010). After effectiveness: new directions in the singapore school system? *Journal of Education Policy*, 17(2), 151-166. <https://doi.org/10.1080/02680930110116507>
- Tayan, B. (2017). The Saudi tatweer education reforms: implications of neoliberal thought to Saudi education policy. *International Education Studies*, 10(5), 61-71. <https://doi.org/10.5539/ies.v10n5p61>
- Topolovčan, T. & Dubovicki, S. (2019). The heritage of the Cold War in contemporary curricula and educational reforms. *Center for Educational Policy Studies Journal*, 9(2), 11-32. <https://doi.org/10.26529/cepsj.567>
- Webb, A. & Radcliffe, S. (2013). Mapuche demands during educational reform, the penguin revolution and the Chilean winter of discontent. *Studies in Ethnicity and Nationalism*, 13(3), 319-341. <https://doi.org/10.1111/sena.12046>
- Wu, H. & Benson, S. (2017). Made in China 2025 and new trends of entrepreneurship education of China: a socio-economic-educational perspective. *Asian Education Studies*, 2(1), 10-19. <https://doi.org/10.20849/aes.v2i1.103>

Selected aspects of preferences and level of knowledge of tourism students in the field of gastronomy¹

Radúz Dula – Roman Lacko²

Abstract

Gastronomy is currently one of the most utilized types of service dedicated to feeding people. In literature, we often encounter that even though people know the meaning of the word gastronomy, they do not know its more specific specifications. The objective of this contribution is to evaluate general knowledge in the field of gastronomy among university students who study business in tourism and services. To achieve this goal, a questionnaire survey was chosen as the most suitable method, which was carried out in November 2023. The sample consisted of more than 150 respondents. The results indicate an insufficient overview in selected areas, thus indicating a guiding trend for the teaching process. Based on the results, it will be possible to more appropriately determine the areas and objectives of teaching in the relevant subjects.

Key words

gastronomy, questionnaire, teaching process, tourism

JEL Classification: L83, Z38, C12

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Introduction

The issue of gastronomy and education is one of the key aspects in the field of tourism management. In general, gastronomy and its processes can be considered an integral part of education in the field of business, management, and tourism development. For future managers to be successful in this area, they must necessarily have a general overview. This contribution will therefore focus on verifying the overview of students who have not yet completed a subject related to the management of gastronomy processes.

According to (Koerich & Müller, 2022), “the term Gastronomy is defined and conceptualized from different perspectives and academic disciplines. It is an ambiguous concept that confronts common belief and scientific knowledge, which cannot be accessed from a single perspective.” According to these authors, gastronomy knowledge consists of scientific, explicit knowledge and popular, tacit knowledge. In this way, they highlighted the transdisciplinary character of this field. They also emphasize the importance of the socio-cultural context, which significantly influences this knowledge (Koerich & Müller, 2022). Cultural aspects

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are one of the most important aspects of gastronomy. Socio-cultural aspects of eating can even have an impact on the health status of a given population (Monterrosa, Frongillo, Drownowski, De Pee, & Vandevijvere, 2020). There are differences in the approach to selected activities based on the characteristics of individual cultures (Djelic et al., 2021; Schwitzgebel, Cokelet, & Singer, 2020). In many cases, it is not only about the customs of individual cultures but also about their specific features (Spence, 2022). Gastronomy is often the driving force behind the development of tourism, with gastronomic tourism being a relevant term and a significant area of research in the field of tourism (Razpotnik Visković & Komac, 2021). A relatively current and systematizing study is the study by the authors (Yong, Chua, Han, & Kim, 2022), which emphasizes the future scientific direction in this field.

General knowledge in the field of gastronomy goes hand in hand with access to information, the driving force of which is social networks and the internet in general today. Even young people should master basic information and gastronomic offers, how to distinguish quality gastronomic establishments, and know relevant rankings, such as Michelin (Batat, 2020).

One of the most used areas in the field of gastronomy is social etiquette. It is the basis for the development of communication, and social inclusion, and in many cases, it is also the driving force behind entrepreneurial success. It is necessary to master its rules for personal development (Dash, 2022). Many studies also express ethics (not etiquette) in the field of gastronomy. All these studies examine the ethical and moral side when choosing food that a person will consume (Şahin & Gök Demir, 2023; Sharma et al., 2022). However, in this contribution, we will focus more on etiquette.

1 Methodology

The main goal of this study is to evaluate the level of general knowledge in the field of gastronomy and dining etiquette among students of the study program Business in Tourism and Services. Based on identifying general knowledge, we can proceed to make the teaching process more efficient and targeted at selected areas that students are insufficiently mastering.

1.1 Research object

One of the main ways of achieving the goal of this study was a survey of knowledge in a selected group of students of the aforementioned study program. This survey was conducted using a questionnaire. The questionnaire was distributed to students online during selected seminars. In this way, we managed to collect more than 150 responses. Subsequently, based on selected criteria - mainly incomplete answers, deliberately incorrect answers, etc., we filtered out 126 reliable respondents. The survey was attended by 39 male respondents and 87 female respondents, which is also the approximate proportion of tourism students at the relevant faculty. The age of the respondents was in the range of 18 - 23 years.

1.2 Methods and Hypotheses

To fulfil this study's goal, we set several research questions that focused on areas where the potential for insufficient student knowledge is highest. The first research question was whether students have a basic overview of the field of gastronomy at home (Slovakia) and abroad. The second research question was whether students perceive and master the basic aspects of etiquette in the field of dining. Based on these research questions, we also set hypotheses that will help us identify the state of student knowledge. Since the survey is a sampling examination, we used a one-sample t-test to verify the claims about the basic set. Its assumption is the validity of the central limit theorem, which we fulfilled in our research by the size of the sample of 126 respondents. The null and alternative hypotheses in the case of a one-sample t-test are:

H_0 : Mean of the population μ is equal to chosen value μ_0

H_1 : Mean of the population μ is not equal to chosen value μ_0 .

To be able to decide on hypotheses, we need a t-value and a p-value. The test t-characteristic is calculated using the following formula (1):

$$t = \frac{\bar{x} - \mu_0}{s/\sqrt{n}} \quad (1)$$

If the p-value calculated in the next step is lower than the significance level (0.05) we reject the null hypothesis. All calculations were performed in SAS Enterprise Guide 8.3.

2 Results and Discussion

In this section, we will describe the main results of our study. The section is divided into two main subsections. Please note that this translation has been done in a scientific style.

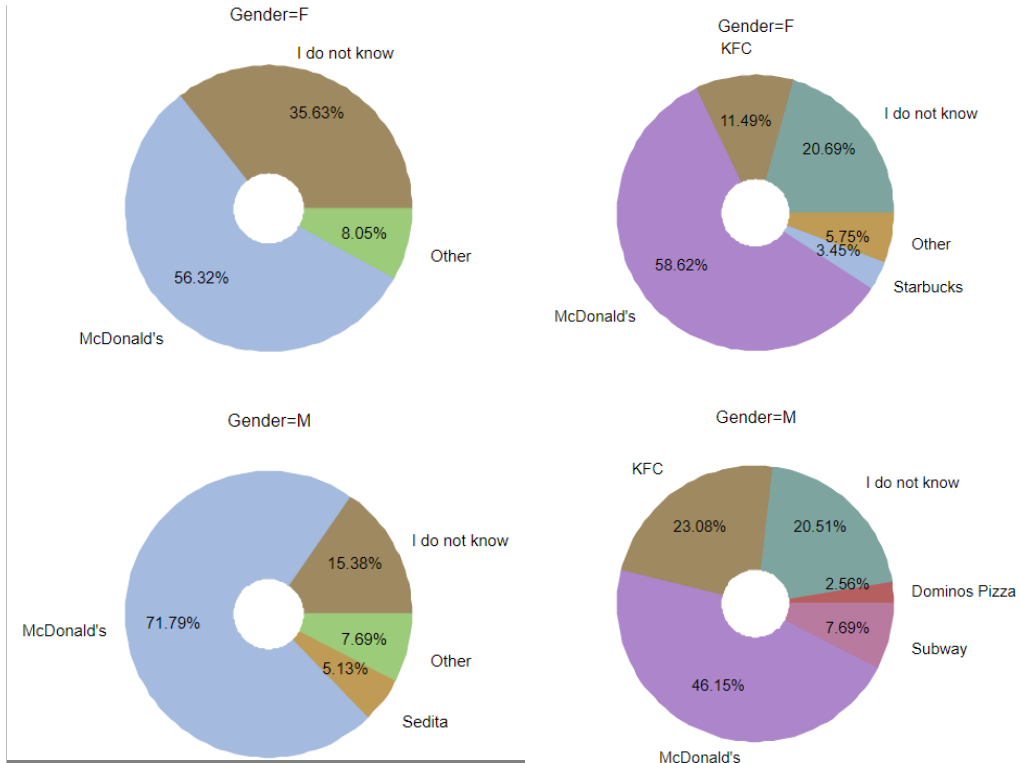
2.1 Analysis of the main knowledge in gastronomy

In this subsection, we will focus on the analysis of the questionnaire results for the area of basic knowledge of students about gastronomy in Slovakia and around the world. Overall, we analysed the results of responses to four main questions:

1. Which restaurant had the highest revenues in Slovakia in the previous year?
2. Which restaurant has the most branches worldwide?
3. Which restaurant in Slovakia achieves the best rating?
4. Which restaurant ranking is the most recognized worldwide?

The results of the responses to each question can be seen in Graphs 1 and 2.

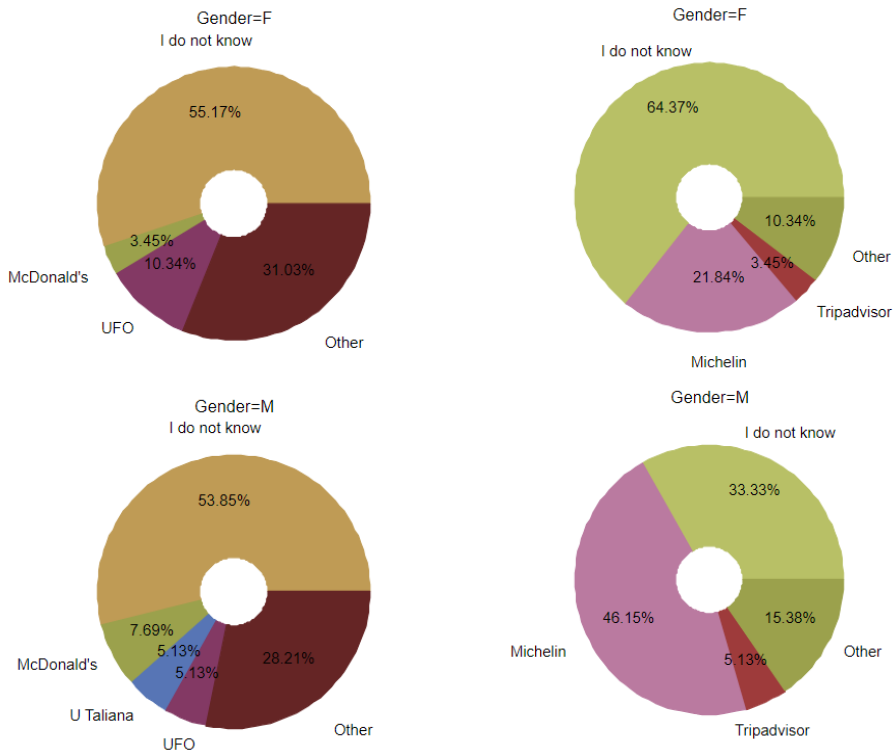
Graph 1 Donut plot of answers to questions 1 (left) and 2 (right)



Source: own processing according to questionnaire performed.

The correct answer to question number 1 was McDonald's. As can be observed in Graph 1, nearly 57% of women and 72.7% of men answered correctly. The success rate of the responses is relatively high. A significant number of both women and men were unable to answer the question. An interesting observation is the higher number of "Sedita" responses, which is a food company that produces confectionery. Other responses included Kaufland, Medusa Group, and many others. For question number 2, the correct answer was Subway. Only 7.69% of men answered correctly. The number of women who answered correctly was significantly lower, with only 2 respondents in absolute terms. The majority of respondents falsely identified McDonald's as the correct answer. KFC also dominated the responses. A significant number of respondents, approximately 20%, answered: "I don't know". The following Graph 2 captures the responses to questions number 3 and 4.

Graph 2 Donut plot of answers to questions 3 (left) and 4 (right)



Source: own processing according to questionnaire performed.

In response to question number 3, which pertained to the highest-ranked Slovak restaurant, there were several correct answers. Recognized responses included UFO, Yasai, U Taliana, Wagamama, and Gašperov mlyn. Of course, other restaurants could also be considered as the correct answer, but they did not appear in the respondents' answers. In total, there were 19 correct answers, representing approximately 15% of the responses. The correct answer to question 4 was Michelin. The responses to this question were largely successful, especially among males, where as many as 46% answered correctly. This percentage dropped to almost 22% among females. Other interesting responses included TripAdvisor, Booking, Forbes, and Master Chef. The results of the statistical testing are presented in Table 1.

Tab. 1 One-sample t-test result of questions 1 - 4

<i>Option/ Indicator</i>	<i>Highest Turnover in Slovakia</i>	<i>Most branches in the world</i>	<i>Best-rated restaurant in Slovakia</i>	<i>Most famous ranking in the world</i>
Target value μ_0	1	1	1	1
Lower 95% CL	0.5083	0.0051	0.0874	0.2203
Upper 95% CL	0.6821	0.0742	0.2141	0.3828
t-value	-9.22	-55.00	-26.53	-17.01
Pr > t	<.0001	<.0001	<.0001	<.0001

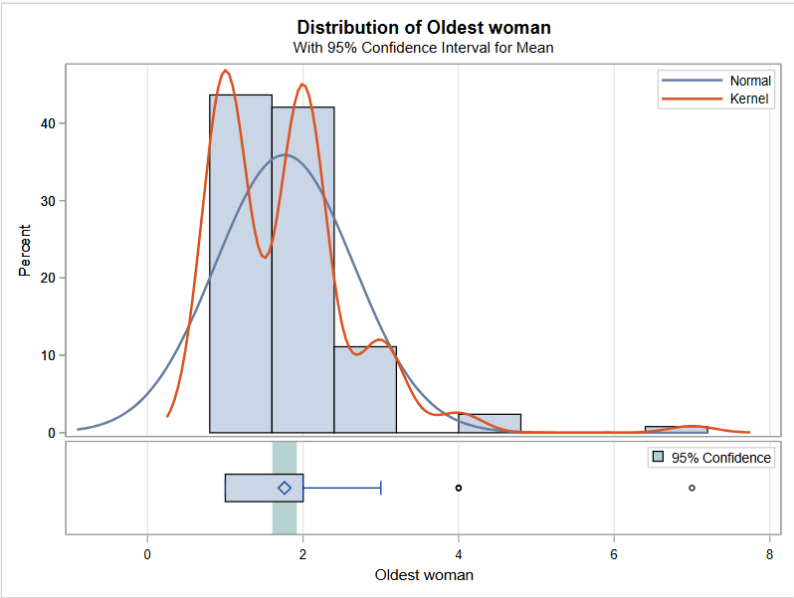
Source: own processing according to questionnaire performed.

The results of the one-sample t-tests at the significance level of 0.05 are presented in Table 1. The hypothesis tested was whether it can be stated about the population that the average answer equals 1, i.e., is correct. In the case of each question, it cannot be stated that the respondents were successful. Since the p-value is lower than the significance level in all cases, we reject the hypothesis that the average of the population's responses equals 1 (which is the numerical expression of the correct answer).

2.2 Analysis of the main knowledge in gastronomy etiquette

In this section, we will focus on the results of responses related to etiquette in gastronomy. The following Graphs 3 to 8 display the distributions of responses to the question in which respondents had to specify the correct order of service at the table according to the guest's gender and age. Respondents had a choice of 7 options for each category according to the order, where option 7 meant that it has no impact on the order. The correct order was: first, the oldest lady is served (numerical expression - 1), then the woman (2), then the oldest man (3), then the man (4), then the child (5) and the one who ordered first has no impact on the order (7). In Graph 3, we present the results of responses to the order of service of the oldest woman.

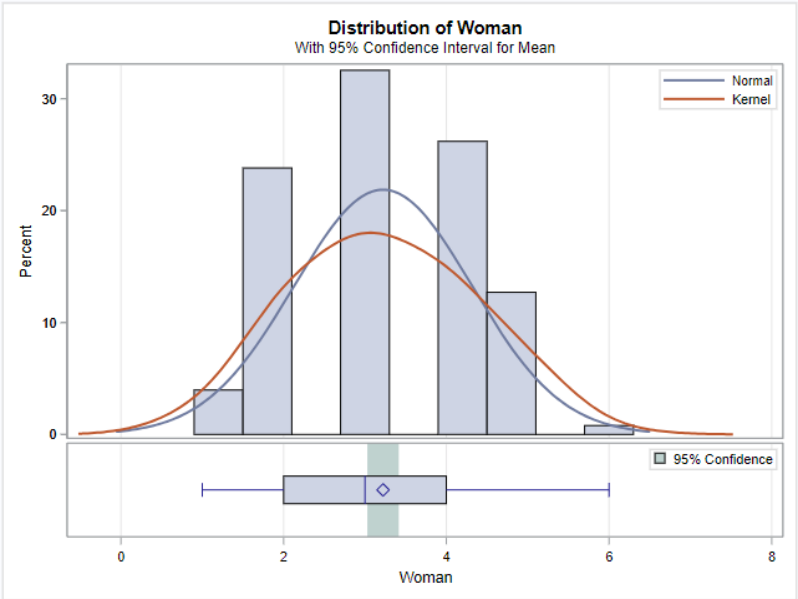
Graph 3 Histogram of responses to the order of service of the oldest woman



Source: own processing according to questionnaire performed.

Most respondents, more than 40%, answered correctly that the oldest woman is served at the table first. A relatively large number of respondents incorrectly stated that she should be served second in order, just over 10% of respondents stated the service of the oldest woman as the third in order. In Graph 4, we present the results of responses to the order of service of a woman.

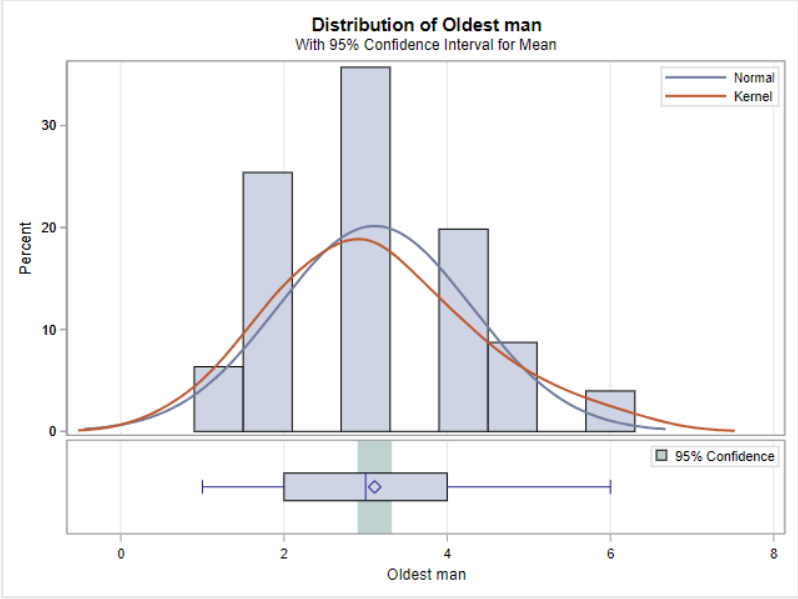
Graph 4 Histogram of responses to the order of service of the woman



Source: own processing according to questionnaire performed.

In Graph 5, we present the results of responses to the order of service of the oldest man.

Graph 5 Histogram of responses to the order of service of the oldest man

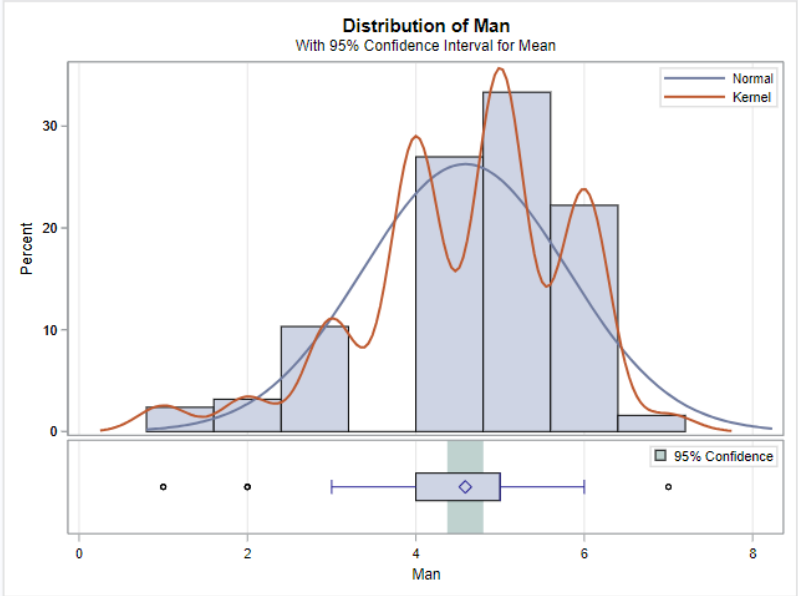


Source: own processing according to questionnaire performed.

In the case of the results shown in Graphs 4 and 5, a similar distribution of responses can be observed. The respondents were probably confused by the option 'Oldest Man', which could have given the impression that he should be served immediately after the 'Oldest

Woman'. This was also reflected in the ambiguity of the responses. In Graph 6, we present the results of responses to the order of service of a man.

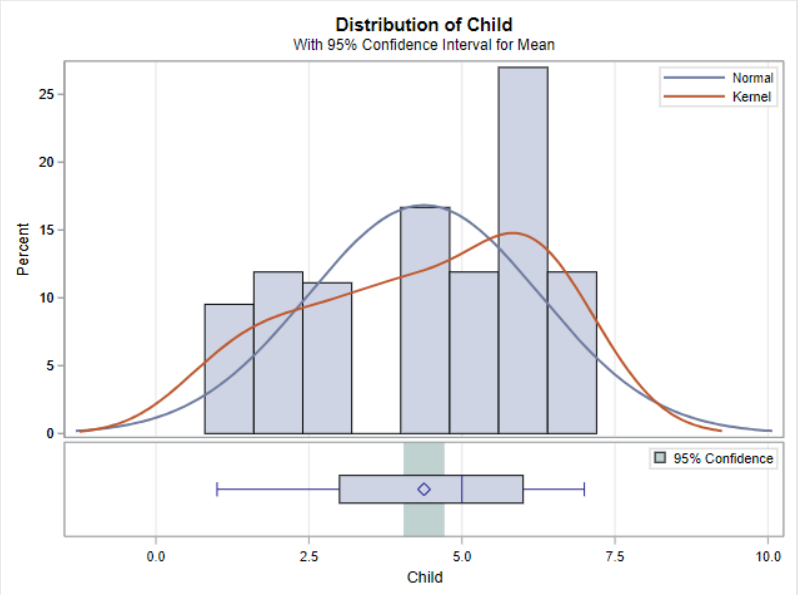
Graph 6 Histogram of responses to the order of service of the man



Source: own processing according to questionnaire performed.

The largest number of responses, to determine the order of service of a man, was in the range from 4 to 6, however, responses 1, 2, or 7 also appeared. In general, the variability of responses to the order of a man is high. In Graph 7, we present the results of responses to the order of service of a child.

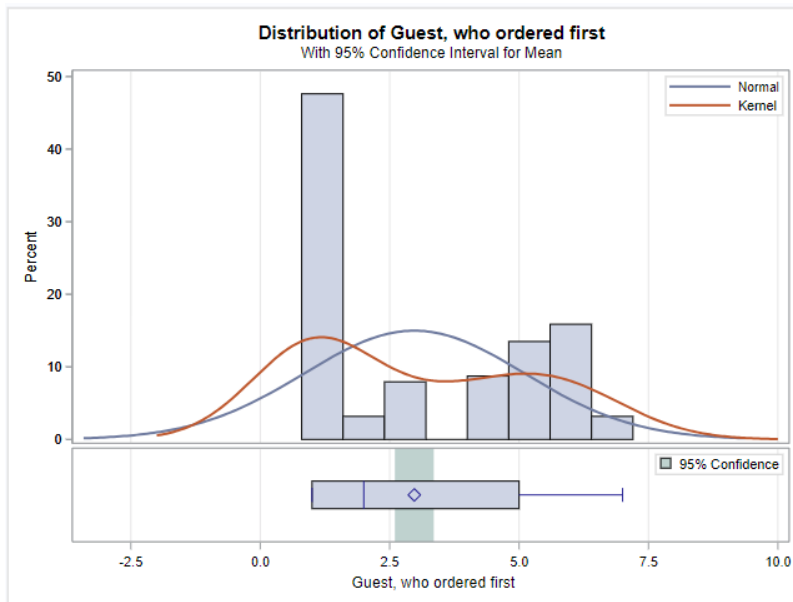
Graph 7 Histogram of responses to the order of service of the child



Source: own processing according to questionnaire performed.

The most ambiguous responses were recorded in the case of the order of service of a child when the distribution took on a distinctly platykurtic shape. According to the rules, the child should be served last. Although most values are concentrated around responses 5 or 6, the frequency of responses is not significantly significant, unlike previous options. In Graph 8, we present the results of responses to the order of service of the person who ordered the first.

Graph 8 Histogram of responses to the order of service of the person who ordered first



Source: own processing according to questionnaire performed.

Who ordered first has no impact on the order of service. However, it is an option that significantly influenced the survey results, as it suggestively induced a false belief. Most respondents even ranked it directly as the first served. Subsequently, we verified whether it can be stated based on the sample that the population masters the etiquette of service. The results of the one-sample t-test are presented in Table 2.

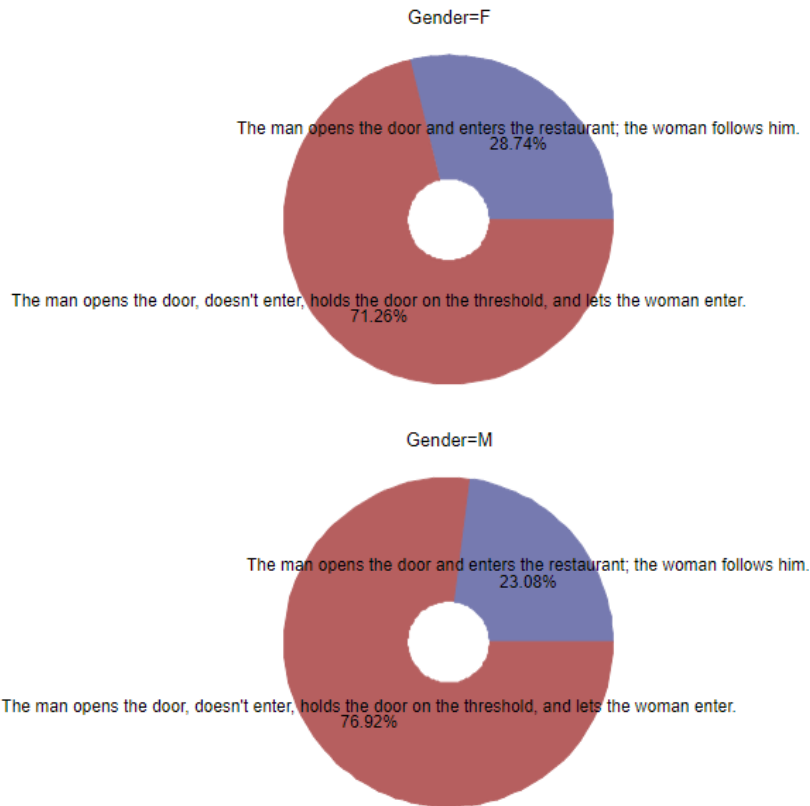
Tab. 2 One-sample t-test of questions related to etiquette

<i>Option/ Indicator</i>	<i>Oldest woman</i>	<i>Woman</i>	<i>Oldest man</i>	<i>Man</i>	<i>Child</i>	<i>Guest, who ord. 1st</i>
Target value μ_0	1	2	3	4	5	7
Lower 95% CL	1.6051	3.0292	2.9016	4.3731	4.0465	2.6007
Upper 95% CL	1.9187	3.4152	3.3206	4.8015	4.7154	3.3517
t-value	9.62	12.53	1.05	5.43	-3.66	-21.21
Pr > t	<.0001	<.0001	0.2958	<.0001	0.0004	<.0001

Source: own processing according to questionnaire performed.

Based on the t-test results, the test t-value, and the p-value, we reject the hypotheses about the correct answer for all options except for the option 'Oldest Man'. This suggests a disregard for service rules among young college students. The following Graph 9 presents the results of the response to the question, Who enters the restaurant first?

Graph 9 Percentage of answers to the question, who enters the restaurant first



Source: own processing according to questionnaire performed.

As can be observed from the gender-based response results, respondents do not master the basic rules of etiquette when entering restaurant premises. The correct answer was that the man should open the door, enter the restaurant, and the woman would follow him. As many as 77 percent of men do not master this rule, which is incidentally an even larger percentage than women, who are not the actual implementers of this rule. This observation suggests a significant gap in the understanding and application of this particular etiquette rule among the surveyed population. Further research may be necessary to explore the underlying causes and potential solutions.

Conclusion

Our research has pointed out several important aspects. In general, young people are mainly proficient in areas related to fast food. A worse situation occurs with other forms of gastronomy. To a large extent, knowledge in the field of economic and also qualitative aspects of gastronomy among young people is insufficient, this trend is even more pronounced among women. Another interesting fact is that many respondents do not master some aspects at all and the answer did not even come close to the correct one. The problematic area is also dining etiquette. Our results have shown that young people almost do not master etiquette at all. Considering that students of economic fields tend to become managers once

(possibly in gastronomy too), it is necessary to point out the possibilities of their further education in selected lessons. Gastronomy is not only part of hotels and hospitality management, but as an integral topic shall be used in lessons on entrepreneurship or human resources management. It is also an integral part in medical spa and wellness management, where food itself (gastronomy) is key of success in the chosen therapy.

This paper shall support gastronomy focused lessons/curricula on university and high school level, not only focusing on gastronomy itself, but also on the topic of etiquette. A wider overview of quality and success in gastronomy (excluding fast food) is also lacking among our focus group of students / young adults. Answers and the implementation of the results to tested questions are vital for employees, managers and entrepreneurs in gastronomy, hospitality, and also medical spa (where gastronomy is an integral part of treatment) in order to understand the basic principles of serving guests.

Given that this scientific field has an interdisciplinary - if not transdisciplinary character, there could be a teaching subject that would develop students' knowledge even between the faculty character. Also, given the availability of information, it is really necessary for students to use reliable sources of information for their personal development (Papas, 2021; Plec, 2024).

References

- Batat, W. (2020). Pillars of sustainable food experiences in the luxury gastronomy sector: A qualitative exploration of Michelin-starred chefs' motivations. *Journal of Retailing and Consumer Services*, 57, 102255. <https://doi.org/10.1016/j.jretconser.2020.102255>
- Dash, D. B. B. (2022). The Importance of Etiquette and Useful Expressions in English: A Critical Analysis. *Iterary Horizon*, 2(3).
- Djekic, I., Bartkiene, E., Szűcs, V., Tarcea, M., Klarin, I., Černelić-Bizjak, M., ... Guiné, R. P. F. (2021). Cultural dimensions associated with food choice: A survey based multi-country study. *International Journal of Gastronomy and Food Science*, 26, 100414. <https://doi.org/10.1016/j.ijgfs.2021.100414>
- Koerich, G. H., & Müller, S. G. (2022). Gastronomy knowledge in the socio-cultural context of transformations. *International Journal of Gastronomy and Food Science*, 29, 100581. <https://doi.org/10.1016/j.ijgfs.2022.100581>
- Monterrosa, E. C., Frongillo, E. A., Drewnowski, A., De Pee, S., & Vandevijvere, S. (2020). Sociocultural Influences on Food Choices and Implications for Sustainable Healthy Diets. *Food and Nutrition Bulletin*, 41(2_suppl), 59S-73S. <https://doi.org/10.1177/0379572120975874>
- Papas, C. (2021). Restaurant server training: Top 10 etiquette tips. Retrieved 25 June 2024, from <https://blog.typsy.com/restaurant-server-training-top-10-etiquette-tips>
- Plec, R. (2024, March 4). Mastering Server Etiquette: Essential Tips for Restaurant Servers. Retrieved 25 June 2024, from Authentic Hospitality website: <https://www.authentichospitalitygroup.com/server-etiquette/>
- Razpotnik Visković, N., & Komac, B. (2021). Gastronomy tourism: A brief introduction. *Acta Geographica Slovenica*, 61(1). <https://doi.org/10.3986/AGS.10258>
- Şahin, E., & Gök Demir, Z. (2023). Decision Tree Analysis of Sustainable and Ethical Food Preferences of Undergraduate Students of Gastronomy and Culinary Arts. *Sustainability*, 15(4), 3266. <https://doi.org/10.3390/su15043266>

- Schwitzgebel, E., Cokelet, B., & Singer, P. (2020). Do ethics classes influence student behavior? Case study: Teaching the ethics of eating meat. *Cognition*, *203*, 104397. <https://doi.org/10.1016/j.cognition.2020.104397>
- Sharma, A., Jolly, P. M., Chiles, R. M., DiPietro, R. B., Jaykumar, A., Kesa, H., ... Saulais, L. (2022). Principles of foodservice ethics: A general review. *International Journal of Contemporary Hospitality Management*, *34*(1), 135–158. <https://doi.org/10.1108/IJCHM-12-2020-1486>
- Spence, C. (2022). Interacting with food: Tasting with the hands. *International Journal of Gastronomy and Food Science*, *30*, 100620. <https://doi.org/10.1016/j.ijgfs.2022.100620>
- Yong, R. Y. M., Chua, B.-L., Han, H., & Kim, B. (2022). Taste your way across the globe: A systematic review of gastronomy tourism literature (2000-2021). *Journal of Travel & Tourism Marketing*, *39*(7–9), 623–650. <https://doi.org/10.1080/10548408.2023.2184445>

Inovácie v marketingovej stratégii pre drevostavby- úloha digitálneho a zeleného marketingu¹

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Innovations in Marketing Strategies for Wooden Buildings: The Role of Digital and Green Marketing

Abstract

This paper focuses on the analysis of marketing strategies in the wooden building sector, with a particular emphasis on digital and green marketing. The aim of the research is to identify the effectiveness of these marketing tools in promoting ecological solutions in construction. The study uses a combination of qualitative analysis and comparative methods to evaluate the marketing mix of selected companies. The findings show that the successful use of digital technologies, such as virtual tours and online configurators, along with ecological certifications, significantly increases customer awareness and interest in wooden buildings. The paper provides recommendations for optimizing marketing strategies and supporting sustainable development in ecological construction solutions.

Key words

digital marketing, green marketing, wooden buildings, sustainable construction

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Úvod

V posledných rokoch sa výskum v oblasti ekologického a udržateľného marketingu v stavebnom sektore zameriava predovšetkým na ekologické produkty, medzi ktoré patria aj drevostavby. Tieto produkty, ktoré sú považované za energeticky efektívne a šetrné k životnému prostrediu, získali veľkú pozornosť v oblasti marketingových stratégií. Výskum sa často sústreďuje na to, ako ekologické a udržateľné produkty, ako sú drevostavby, môžu získať širšie uplatnenie na trhu (Dorčák et al., 2014). Mnohé štúdie sa zameriavajú na rôzne marketingové nástroje, ktoré podporujú predaj ekologických výrobkov, vrátane digitálneho marketingu, obsahového marketingu, certifikácií a prístupu k udržateľnosti (Vaverka et al., 2008; Kolb, 2011; Kocián, 2021; Toivonen et al., 2021).

Digitálny marketing zohráva kľúčovú úlohu v oslovovaní nových zákazníkov, najmä prostredníctvom interaktívnych a personalizovaných kampaní, ako sú virtuálne prehliadky, online konfiguratory a sociálne médiá (Petruch & Walcher, 2021; Wichmann et al., 2022; Nasiri et al., 2021). Ako naznačuje Terho et al. (2022), digitálne technológie umožňujú firmám lepšie zapojiť zákazníkov a zvýšiť ich angažovanosť. Na druhej strane, zelený marketing,

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ktorý sa zameriava na ekologické certifikácie (ako FSC, PEFC) a komunikáciu environmentálnych výhod produktov, zohráva dôležitú úlohu v budovaní dôvery medzi spotrebiteľmi a firmami (Shi et al., 2022; Amiri et al., 2021; Toppinen et al., 2018). Tento prístup sa ukazuje ako veľmi efektívny v prípade drevostavieb, kde environmentálny aspekt je hlavným predajným bodom.

Napriek bohatému výskumu v tejto oblasti, stále chýba komplexné prepojenie digitálneho a zeleného marketingu, ktoré by detailne ukázalo, ako tieto dve stratégie spolu fungujú a aký vplyv majú na rozhodovanie zákazníkov pri výbere ekologických riešení v stavebníctve (Straková et al., 2021). Väčšina štúdií sa zameriava buď na jeden z týchto aspektov, ale neexistuje dostatočný výskum, ktorý by skúmal, ako kombinácia týchto prístupov ovplyvňuje povedomie o ekologických produktoch a podporuje rozhodovanie zákazníkov (Reydet & Carsana, 2017). Zostáva nejasné, ako môžu firmy efektívne kombinovať digitálne nástroje s ekologickými certifikáciami a ďalšími zelenými stratégiami na zvýšenie predaja drevostavieb a zlepšenie konkurencieschopnosti na trhu (Yang et al., 2022).

Cieľom tohto výskumu je preskúmať inovatívne marketingové stratégie v sektore drevostavieb s osobitným dôrazom na digitálny a zelený marketing. Výskum sa zameriava na analýzu marketingového mixu a jeho vplyv na zákaznicke správanie, pričom skúma, ako tieto stratégie zvyšujú povedomie o drevostavbách ako ekologických riešeniach a podporujú rozhodovanie zákazníkov pri ich výbere. Táto štúdia sa tiež zameriava na identifikáciu nástrojov marketingového mixu, ktoré sú kľúčové pre efektívne marketingové stratégie, a poskytuje praktické odporúčania pre optimalizáciu marketingových stratégií v sektore drevostavieb. Cieľom je zlepšiť nielen teoretické pochopenie tejto problematiky, ale aj poskytnúť podnikateľom hodnotné poznatky na zlepšenie ich marketingových prístupov. Tento prístup je podporený literatúrou o ekologických trendoch a digitálnych technológiách, ktoré hrajú rozhodujúcu úlohu v súčasnom marketingovom prostredí.

Štruktúra príspevku je nasledovná: v prvej časti sa predstavuje teoretický základ o digitálnom a zelenom marketingu v kontexte drevostavieb, v druhej časti sa popisujú metodologické postupy použité pri výskume, nasleduje analýza získaných dát a diskusia o zisteniach, pričom v závere sú prezentované odporúčania pre prax a návrhy pre ďalší výskum. Cieľom tejto práce je nielen identifikovať efektívne marketingové stratégie, ale aj prispieť k zlepšeniu udržateľného marketingu v oblasti stavebníctva.

1 Metodika práce

Cieľom tohto príspevku je preskúmať inovatívne marketingové stratégie v sektore drevostavieb, pričom osobitný dôraz je kladený na digitálny a zelený marketing. Tieto prístupy sú kľúčové pri propagácii ekologických a udržateľných riešení bývania, pretože umožňujú efektívne komunikovať hodnoty produktov zákazníkom, zvyšovať ich povedomie a podporovať rozhodovanie pri kúpe. Výskum sa zameriava na identifikáciu najdôležitejších nástrojov marketingového mixu, hodnotenie ich efektívnosti v kontexte ekologického stavebníctva a formuláciu odporúčaní, ktoré by mohli optimalizovať marketingové stratégie podnikov pôsobiacich v tomto sektore. Tento postup umožnil detailné preskúmanie jednotlivých prvkov marketingových stratégií, ich vzájomných prepojení a vplyvu na zákaznicke správanie a konkurencieschopnosť podnikov.

Dáta použité v tomto príspevku pochádzajú z primárnych aj sekundárnych zdrojov. Primárne dáta boli zhromaždené prostredníctvom analýzy podnikových materiálov, ako sú

webové stránky, katalógy a technické špecifikácie produktov, a pozorovania prezentácií podnikov na veľtrhoch a odborných podujatiach zameraných na ekologické stavebníctvo. Sekundárne dáta zahŕňajú správy Asociácie dodávateľov montovaných domov (ADMD), štatistické údaje o stavebníctve v Českej republike a relevantné vedecké štúdie, ktoré analyzovali preferencie zákazníkov a účinnosť marketingových stratégií.

Dáta boli následne analyzované skrz marketingovú a komparatívnu analýzu. Pri marketingovej analýze sme sa zamerali na podrobnú analýzu digitálneho a zeleného marketingu v sektore drevostavieb a ich vplyv na zákaznícke správanie. Sústredili sme sa na to, ako vybrané spoločnosti implementujú tieto stratégie, aké nástroje využívajú a aké výsledky dosahujú pri propagácii ekologických riešení. Komparatívna analýza nám umožnila porovnať marketingové stratégie jednotlivých spoločností, identifikovať ich silné a slabé stránky a preskúmať rozdiely v ich prístupe k digitálnemu a zelenému marketingu.

Stanovili sme si nasledujúcu výskumnú otázku :

"Akým spôsobom môžu digitálne a zelené marketingové stratégie efektívne prispieť k zvyšovaniu povedomia zákazníkov a podpore ich rozhodovania v prospech ekologických riešení v sektore drevostavieb?"

Táto výskumná otázka vychádza z cieľa príspevku, ktorým je preskúmať inovatívne marketingové stratégie v sektore drevostavieb so zameraním na digitálny a zelený marketing. Marketing ekologických produktov, akými sú drevostavby, sa musí prispôbiť špecifickým potrebám zákazníkov a rastúcemu dopytu po udržateľných riešeniach. Otázka reflektuje potrebu pochopiť prepojenie medzi marketingovými nástrojmi a ich dopadom na rozhodovanie zákazníkov. Tiež umožňuje hodnotiť, ako tieto stratégie podporujú nielen predaj, ale aj budovanie pozitívneho vnímania drevostavieb ako ekologicky zodpovedných produktov.

Výskum sme realizovali na piatich regionálne významných spoločnostiach. Spoločnosti sme z dôvodu ochrany údajov anonymizovali. Spoločnosť A sa vyznačuje dôrazom na inovatívne technológie a vysokú kvalitu svojich produktov. Vďaka implementácii pokročilej CLT technológie a ponuke vysoko personalizovaných riešení zaujíma popredné miesto v segmente luxusných drevostavieb. Spoločnosť B sa zameriava na poskytovanie cenovo dostupných modulárnych riešení, ktoré oslovujú širokú zákaznícku základňu so strednými príjmami. Významnou črtou ich stratégie je flexibilná cenová politika a dostupnosť produktov prostredníctvom regionálnych distribučných sietí. Spoločnosť C je známa svojim inovatívnym prístupom k energeticky efektívnym drevostavbám, pričom používa pokročilé prefabrikované technológie. Široká ponuka dizajnových možností a dôraz na ekologickú udržateľnosť oslovujú predovšetkým mladých a ekologicky uvedomelých zákazníkov. Spoločnosť D sa špecializuje na projekty s vysokými estetickými nárokmi a aktívne využíva lokálne suroviny, čím podporuje regionálnu ekonomiku. Ich úzka spolupráca s architektmi a prezentácia na prestížnych veľtrhoch im zabezpečila reputáciu prémiového hráča na trhu. Spoločnosť E predstavuje moderný prístup k distribúcii, ktorý kombinuje digitálne platformy, virtuálne prehliadky a mobilné showroomy. Ich stratégia sa zameriava na maximálnu dostupnosť produktov pre zákazníkov v mestských aj vidieckych oblastiach.

Výsledky výskumu budeme prezentovať v tabuľkách. Očakávali sme, že výsledky výskumu prinesú jasnejší obraz o efektívnosti jednotlivých marketingových stratégií a ich prínose k budovaniu povedomia a rozhodovania zákazníkov v prospech ekologických riešení.

2 Výsledky a diskusia

2.1 Výskum

Tab.1 Digitálny marketing

Spoločnosť	Digitálny marketing	Stratégia	Hlavné nástroje a prístupy
Spoločnosť A	-Personalizácia digitálneho obsahu,	-zameranie na detailné prezentácie projektov a virtuálne prehliadky,	-interaktívne virtuálne prehliadky, profesionálne spracované prezentácie projektov, podrobný pohľad na produkty.
Spoločnosť B	-Cenovo dostupný digitálny marketing,	-sociálne médiá a influencer marketing na zvýraznenie výhod,	-sociálne médiá, influencer marketing, interaktívne videá z výstavby domov.
Spoločnosť C	-Online konfigurátory a nástroje na plánovanie,	-zapájanie zákazníkov do procesu návrhu,	-online konfigurátory, nástroje na plánovanie domov, zvýšenie angažovanosti zákazníkov.
Spoločnosť E	- Regionálny dosah cez mobilné showroomy a hybridné kampane,	-kombinácia online a offline interakcií pre širší dosah,	-mobilné showroomy, hybridné kampane, kombinácia online a offline prezentácií.

Zdroj: vlastné spracovanie

Spoločnosť A vyniká v personalizácii digitálneho obsahu. Ich digitálne kampane zahŕňajú profesionálne spracované prezentácie projektov a interaktívne prvky, ako sú virtuálne prehliadky vzorových domov. Tento prístup umožňuje zákazníkom detailne preskúmať ponuku produktov a pochopiť ich pridanú hodnotu.

Spoločnosť B kladie dôraz na cenovo dostupný digitálny marketing. Využíva sociálne médiá a influencer marketing na zvýraznenie výhod svojich nízkoenergetických domov. Interaktívne videá z výstavby domov oslovujú mladšie publikum, ktoré hľadá ekologické a finančne dostupné riešenia.

Spoločnosť C sa špecializuje na online konfigurátory a nástroje na plánovanie domov, ktoré zlepšujú zákaznícku skúsenosť a zapájajú zákazníkov do procesu návrhu. Táto forma digitálneho marketingu zvyšuje angažovanosť a vedie k väčšej spokojnosti zákazníkov.

Naopak, Spoločnosť E sa zameriava na regionálny dosah prostredníctvom mobilných showroomov a hybridných kampaní, ktoré kombinujú online a offline interakcie. Táto stratégia umožňuje spoločnosti osloviť aj zákazníkov, ktorí preferujú tradičné formy prezentácie.

Tab.2 Zelený marketing

Spoločnosť	Digitálny marketing	Stratégia	Hlavné nástroje a prístupy
Spoločnosť A	-Zdôraznenie obnoviteľnosti a nízkej uhlíkovej stopy,	-budovanie dôvery a podpora ekologických rozhodnutí zákazníkov,	-prezentácia na veľtrhoch a odborných podujatiach.
Spoločnosť C	-Kombinácia zeleného a obsahového marketingu,	-zvýšenie informovanosti zákazníkov,	-vzdelávacie workshopy o ekologických technológiách.
Spoločnosť D	-Dôraz na certifikácie,	-posilnenie dôveryhodnosti a zvýšenie povedomia,	-certifikácie FSC a PEFC, odborné články, blogy.
Spoločnosť E	- Ekologické doplnky a energeticky úsporné technológie,	-zdôraznenie dlhodobej finančnej a ekologickej hodnoty,	-modulárne riešenia, energeticky úsporné technológie.

Zdroj: vlastné spracovanie

Spoločnosť A využíva zelený marketing na zdôraznenie obnoviteľnosti a nízkej uhlíkovej stopy svojich produktov. Prezentácia projektov na veľtrhoch a odborných podujatiach zvyšuje dôveru zákazníkov a podporuje rozhodovanie v prospech ekologických riešení.

Spoločnosť C efektívne spája zelený marketing s obsahovým marketingom. Organizuje vzdelávacie workshopy o ekologických technológiách, čím zvyšuje informovanosť zákazníkov a zároveň podporuje ich pozitívne vnímanie ekologických produktov.

Spoločnosť D kladie dôraz na certifikácie, ako sú FSC a PEFC, ktoré potvrdzujú ekologický pôvod materiálov. Ich propagácia prostredníctvom odborných článkov a blogov posilňuje dôveryhodnosť a zvyšuje povedomie o ekologických výhodách ich produktov.

Spoločnosť E sa zameriava na ekologické doplnky, ako sú modulárne riešenia a energeticky úsporné technológie, pričom zdôrazňuje ich dlhodobú finančnú i ekologickú hodnotu.

V oblasti digitálneho marketingu sa spoločnosti A, B a C sa vyznačujú aktívnym zapojením zákazníkov prostredníctvom interaktívnych digitálnych nástrojov, ktoré podporujú ich angažovanosť a zlepšujú zákaznícku skúsenosť. Spoločnosť A kladie dôraz na personalizáciu a vysokú kvalitu obsahu, pričom využíva profesionálne spracované prezentácie projektov a virtuálne prehliadky vzorových domov. Tento prístup jej umožňuje zaujať prémiový segment zákazníkov, ktorí preferujú detailné informácie a individuálny prístup. Spoločnosť B naopak využíva cenovo dostupné formy digitálnej propagácie orientované na širšie publikum. Sociálne médiá a influencer marketing sú kľúčovými nástrojmi, ktoré umožňujú jednoduché a efektívne šírenie informácií o produktoch, pričom interaktívne videá z výstavby domov oslovujú mladšie generácie zákazníkov, ktoré hľadajú ekologické a finančne dostupné riešenia. Spoločnosť C sa sústreďuje na technické riešenia, ako sú online konfigurátory a plánovacie nástroje, ktoré zlepšujú interakciu so zákazníkom. Tieto nástroje nielenže zapájajú zákazníkov do procesu návrhu ich budúceho domova, ale zároveň zvyšujú ich spokojnosť tým, že im umožňujú personalizovať produkty podľa ich potrieb. Spoločnosť E kombinuje digitálne a regionálne prístupy, čím rozširuje dosah na zákazníkov, ktorí preferujú tradičné aj moderné formy interakcie. Mobilné showroomy a hybridné kampane jej umožňujú osloviť rôzne segmenty zákazníkov, vrátane tých v menej dostupných regiónoch.

V oblasti zeleného marketingu sú najvýraznejšie spoločnosti D a A, ktoré kladú dôraz na certifikácie a ekologické certifikáty, ako sú FSC a PEFC, ktoré potvrdzujú ekologický pôvod materiálov. Tieto certifikácie posilňujú dôveryhodnosť produktov a podporujú zákaznícke rozhodovanie v prospech udržateľných riešení. Spoločnosť C sa odlišuje tým, že do svojich stratégií zeleného marketingu pridáva vzdelávací rozmer, organizuje workshopy o ekologických technológiách a zvyšuje tak informovanosť zákazníkov. Tento prístup oslovuje predovšetkým ekologicky uvedomelých zákazníkov, ktorí ocenia prehĺbenie svojho povedomia o environmentálnych výhodách drevostavieb. Spoločnosť E integruje zelený marketing do svojej cenovej a produktovej stratégie, čím jej umožňuje ponúkať ekologické riešenia za dostupné ceny. Zdôrazňuje dlhodobú finančnú aj ekologickú hodnotu svojich modulárnych a energeticky úsporných riešení, čo jej pomáha osloviť zákazníkov s rôznymi rozpočtovými možnosťami. Týmto prístupom spoločnosť kombinuje udržateľnosť s ekonomickou efektívnosťou, čo jej poskytuje jedinečnú konkurenčnú výhodu na trhu.

2.2 Diskusia

Zistenia tejto štúdie ukazujú, že kombinácia digitálneho a zeleného marketingu je kľúčová pre efektívne zvyšovanie povedomia zákazníkov a podporu ich rozhodovania v prospech ekologických riešení v sektore drevostavieb. Digitálne nástroje umožňujú firmám prezentovať hodnotu drevostavieb prostredníctvom moderných a interaktívnych foriem komunikácie, zatiaľ čo zelený marketing posilňuje dôveryhodnosť produktov zdôrazňovaním ich environmentálnych benefitov a certifikácií.

Výskumná otázka:

„Akým spôsobom môžu digitálne a zelené marketingové stratégie efektívne prispieť k zvyšovaniu povedomia zákazníkov a podpore ich rozhodovania v prospech ekologických riešení v sektore drevostavieb?“

Zistenia naznačujú, že digitálny marketing je účinným nástrojom na zvýšenie povedomia zákazníkov o ekologických výhodách drevostavieb. Spoločnosť A využíva virtuálne prehliadky a interaktívne konfigurátory, čo umožňuje zákazníkovi podrobne spoznať ekologické a technické vlastnosti ich produktov. Tieto nástroje zvyšujú zákaznícku angažovanosť a vedú k informovanejšiemu rozhodovaniu. Táto stratégia potvrdzuje výsledky Terho et al. (2022), ktorí zdôrazňujú význam interaktívnych nástrojov pre budovanie pozitívneho vnímania produktov. Sociálne médiá a influencer marketing, ktoré využíva spoločnosť B, sa ukázali ako mimoriadne efektívne pri oslovovaní mladšej generácie zákazníkov. Príťažlivé vizuálne kampane a videá zamerané na proces výstavby nízkoenergetických domov demonštrujú praktické výhody drevostavieb. Tento prístup je v súlade s tvrdením Wichmann et al. (2022), že digitálny marketing môže formovať postoje zákazníkov v prospech udržateľných riešení. Virtuálne a hybridné prezentácie, ktoré používa spoločnosť E, ukázali, že kombinácia online a offline prístupov je efektívna pri oslovení širokého publika, vrátane zákazníkov preferujúcich tradičné formy prezentácie. Tieto nástroje umožňujú firmám preniknúť aj na trhy mimo veľkých miest a zlepšujú dostupnosť ekologických riešení.

Zelený marketing zohráva dôležitú úlohu pri budovaní dôveryhodnosti produktov prostredníctvom ekologických certifikácií a propagácie environmentálnych výhod. Spoločnosť D kladie dôraz na certifikácie FSC a PEFC, ktoré preukazujú ekologický pôvod použitých materiálov. Tieto certifikácie nielen zvyšujú hodnotu produktov, ale aj podporujú rozhodovanie zákazníkov v prospech ekologických riešení, čo potvrdzujú aj Shi et al. (2022). Ekologické doplnky, ako sú solárne panely a zelené strechy, sú ďalším významným prvkom zeleného

marketingu, ktorý zdôrazňujú spoločnosti A a E. Tieto riešenia sú propagované ako dlhodobé investície s finančnými a ekologickými výhodami, čo korešponduje so štúdiou Amiri et al. (2021), ktorá potvrdzuje, že ekologické benefity produktov ovplyvňujú zákaznicke rozhodovanie. Spoločnosť C sa zameriava na vzdelávacie kampane a workshopy o ekologických technológiách, čím zvyšuje informovanosť zákazníkov a podporuje ich pozitívne vnímanie drevostavieb. Tento prístup kombinuje obsahový marketing s praktickou ukázkou výhod ekologických riešení, čím sa odlišuje od tradičných marketingových stratégií.

Táto štúdia bola obmedzená na výskum piatich spoločností pôsobiacich v Českej republike, čo nemusí pokryť všetky rozdiely v marketingových prístupoch na globálnom trhu. Navyše, výskum sa opiera o sekundárne dáta a pozorovania, čo môže znížiť schopnosť identifikovať aktuálne preferencie zákazníkov. Pre ďalší výskum odporúčame rozšíriť analýzu o primárne údaje, ako sú dotazníky alebo rozhovory so zákazníkmi, aby sme lepšie pochopili ich postoje k digitálnemu a zelenému marketingu. Taktiež by bolo užitočné preskúmať, ako rôzne kombinácie digitálnych a ekologických stratégií ovplyvňujú dlhodobú lojalitu zákazníkov. Tento výskum priniesol cenné poznatky o synergii digitálneho a zeleného marketingu a ich prínose pre sektor ekologického stavebníctva, čím vytvára základ pre ďalšie zlepšovanie teórie a praxe v oblasti udržateľného marketingu.

Záver

Tento príspevok poskytol pohľad na efektívnosť digitálnych a zelených marketingových stratégií v sektore drevostavieb, pričom sa zameril na ich schopnosť zvyšovať povedomie zákazníkov o ekologických a udržateľných riešeniach bývania. Výskum preukázal, že kombinácia digitálneho a zeleného marketingu zohráva zásadnú úlohu v získavaní dôvery zákazníkov a podporovaní ich rozhodovania v prospech drevostavieb ako ekologických riešení.

Náš prínos spočíva v analýze marketingového mixu v sektore drevostavieb a v identifikácii kľúčových faktorov, ktoré ovplyvňujú úspech digitálneho a zeleného marketingu. Výsledky tejto štúdie poskytujú praktické odporúčania pre podniky v oblasti drevostavieb, ako optimalizovať svoje marketingové stratégie a lepšie reagovať na rastúci dopyt po ekologických produktoch. Prístup, ktorý zahŕňa integráciu digitálnych nástrojov a ekologických stratégií, ponúka firmám silný nástroj na budovanie značky a zákaznickej lojality. Zovšeobecnenie výsledkov ukazuje, že digitálny marketing a zelený marketing sa navzájom dopĺňajú a spoločne zvyšujú hodnotu produktov v očiach zákazníkov. To znamená, že firmy, ktoré tieto prístupy efektívne kombinujú, sú schopné získať významnú konkurenčnú výhodu na trhu. Výsledky štúdie sú použiteľné nielen pre sektor drevostavieb, ale aj pre ďalšie oblasti udržateľného marketingu, kde ekologické a technologické inovácie zohrávajú kľúčovú úlohu.

Výskum však mal aj svoje limity. Bol zameraný na konkrétny segment trhu v Českej republike, a preto sa výsledky nemusia úplne pokryť všetky rozdiely v marketingových stratégiách na globálnom trhu. Okrem toho, výskum sa opiera prevažne o sekundárne dáta a pozorovania, čo môže obmedziť schopnosť identifikovať aktuálne preferencie zákazníkov. Pre ďalší výskum odporúčame rozšíriť analýzu o primárne údaje, ako sú dotazníky alebo rozhovory so zákazníkmi, aby sme lepšie pochopili ich postoje k digitálnemu a zelenému marketingu. Taktiež by bolo užitočné preskúmať, ako rôzne kombinácie digitálnych a ekologických stratégií ovplyvňujú dlhodobú lojalitu zákazníkov a ich rozhodovanie pri výbere ekologických riešení. Tento výskum priniesol cenné poznatky o synergii digitálneho a zeleného marketingu a ich prínose pre sektor ekologického stavebníctva, čím vytvára základ pre ďalšie zlepšovanie teórie a praxe v oblasti udržateľného marketingu.

Zoznam bibliografických odkazov

- Amiri, A., Emami, N., Ottelin, J., Sorvari, J., Marteinson, B., Heinonen, J., & Junnila, S. (2021). Embodied emissions of buildings - A forgotten factor in green building certificates. *Energy and Buildings*, 241, 110962.
- Dorčák, P., Pollák, F., & Szabo, S. (2014). Analysis of the Possibilities of Improving an Online Reputation of Public Institutions. In *Proceedings of IDIMT-2014: Networking Societies—Cooperation and Conflict: 22nd Interdisciplinary Information Management Talks*, Poděbrady, Czech Republic, September 10–12; Edited by P. Doucek, G. Ch., and V. Oškrdal. Linz: Trauner Verlag.
- Kolb, J. (2011). *Dřevostavby. Systémy nosných konstrukcí, obvodové pláště*. Praha: Grada Publishing.
- Kocián, A. (2021). *Marketingový mix vybrané společnosti*. Karviná: Slezská univerzita v Opavě.
- Nasiri, G. R., Deymeh, H., Karimi, B., & Miandoabchi, E. (2021). Incorporating sales and marketing considerations into a competitive multi-echelon distribution network. *Journal of Retailing and Consumer Services*, 62, 102646.
- Petruch, M., & Walcher, D. (2021). Timber for future? Attitudes towards timber construction by young millennials in Austria - Marketing implications from a representative study. *Journal of Cleaner Production*, 294, 126324.
- Reydet, S., & Carsana, L. (2017). The effect of digital design in retail banking on customers' commitment and loyalty: The mediating role of positive affect. *Journal of Retailing and Consumer Services*, 37, 132–138.
- Shi, J., Yang, D., Zheng, Z., & Zhu, Y. (2022). Strategic investment for green product development and green marketing in a supply chain. *Journal of Cleaner Production*, 366, 132868.
- Straková, J., Korauš, A., Váchal, J., Pollák, F., Černák, F., Talíř, M., & Kollmann, J. (2021). Sustainable Development Economics of Enterprises in the Services Sector Based on Effective Management of Value Streams. *Sustainability*, 13(16), 8978.
- Terho, H., Mero, J., Siutla, L., & Jaakkola, E. (2022). Digital content marketing in business markets: Activities, consequences, and contingencies along the customer journey. *Industrial Marketing Management*, 105, 294–310.
- Toppinen, A., Röhr, A., Pätäri, S., Lähinen, K., & Toivonen, R. (2018). The future of wooden multistory construction in the forest bioeconomy – A Delphi study from Finland and Sweden. *Journal of Forest Economics*, 31, 3–10.
- Toivonen, R., Vihemäki, H., & Toppinen, A. (2021). Policy narratives on wooden multi-storey construction and implications for technology innovation system governance. *Forest Policy and Economics*, 125, 102409.
- Vaverka, J., Havířová, Z., & Jindrák, M. (2008). *Dřevostavby pro bydlení*. Praha: Grada Publishing.
- Wichmann, J. R. K., Uppal, A., Sharma, A., & Dekimpe, M. G. (2022). A global perspective on the marketing mix across time and space. *International Journal of Research in Marketing*, 39(2), 502–521.
- Yang, X., Lyu, H., Li, J., Fu, F., & Zhou, H. (2022). Comprehensive design for a vernacular wood house with energy-saving process. *Sustainable Energy Technologies and Assessments*, 53, 102571.
- Daft, R.L. (2001). *Organizational theory and design*. Mason, OH: South-Western.

The current level of digitalization of small, medium and large enterprises in Slovakia and Ukraine¹

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Abstract

Nowadays the world is changing rapidly under the influence of digital technologies. The aim of the paper is to assess the current level of digitalization of small, medium and large enterprises in Slovakia and Ukraine. The main research methods were statistical analysis and comparison of selected indicators of the information society. The results showed a high differentiation in the level of digitalization for the studied countries and groups of enterprises. They can be an important source of information for understanding the current situation and planning improvements in this area.

Key words

Digitalization, enterprises, Slovakia, Ukraine

JEL Classification: O33; L86

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Introduction

Currently, the key trend for enterprises, which allows them to maintain a leading position in the market, is digitalization. The use of digital technologies increases the ability of companies to innovate and grow, and is also extremely important from the point of view of the development of national and regional economies (Samara et al., 2022).

Measuring the current level of digitalization of enterprises is an important issue, since digital transformation can improve the efficiency of business processes and provide new opportunities for innovation. Taking this fact into account, it is advisable to review and compare the indicators of the use of digital technologies by small, medium and large enterprises in Slovakia and Ukraine.

1 Methodology

The aim of this paper is to assess the current level of digitalization of small, medium and large enterprises in Slovakia and Ukraine. To achieve the goal, the following questions were formulated:

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RQ1: What is the level of digitalization of small, medium and large enterprises in these countries?

RQ2: Which digital technologies are dominant in small, medium and large enterprises in Slovakia and Ukraine?

The assessment of the level of business digitalization in Slovakia was carried out based on data from a survey on the use of ICT and e-commerce in enterprises in the European Union (Eurostat). Data on the use of digital technologies by Ukrainian enterprises was obtained from the website of the State Statistics Service of Ukraine. The main research methods were statistical analysis and comparison of selected indicators of the information society.

2 Results and Discussion

Topics related to the study of the level of digitalization and the use of digital technologies in companies are often found in the literature. The level of digitalization in individual countries around the world differs. According to Urciuoli et al. (2013) companies in some countries are implementing digitalization to improve product quality and efficiency (Japan, Germany), while in others they are developing new business models based on digital offerings and services (USA). Assessment of the level of digitalization of enterprises in selected countries of Central and Eastern Europe showed that the highest the level of digitalization was recorded in Slovenia, Croatia and the Czech Republic, and the lowest in Bulgaria and Romania (Brodny & Tutak, 2022).

2.1 Current level of digitalization of enterprises in Slovakia

To assess the level of digitalization of enterprises in the countries of the European Union, the Digital Intensity Index (DII), based on surveys regarding the use of ICT and e-commerce, is widely used.

Tab. 1 Digital Intensity by size class of enterprise in Slovakia and EU-27, 2023 (as of %)

DII	Small enterprises		Medium enterprises		Large enterprises	
	SK	EU	SK	EU	SK	EU
Very low	61.2	45.4	42.1	24	15.5	9
Low	24.8	33.8	33.7	34	34.7	22.7
High	15.1	17.4	19.6	32.3	35	41.9
Very high	2.3	3.5	4.6	9.6	14.9	26.3
At least basic level of digital intensity	38.8	54.6	57.9	76	84.5	91

Source: Eurostat Database

DII is one of the key performance indicators in the context of the European Digital Decade: digital targets for 2030. This program defines digital ambitions for the next decade in the form of clear and specific goals, one of which is digital business transformation.

In 2023, 38.8% of small and 57.9% of medium-sized enterprises in Slovakia reached the basic level of digital intensity, while the share of large enterprises was 84.5% (Table 1). The basic level requires the use of at least 4 of 12 selected digital technologies, such as

artificial intelligence technologies, social networks, cloud computing, customer relationship management (CRM) or e-commerce sales, representing at least 1% of total turnover.

The level of digitalization of large businesses is naturally higher than that of small and medium-sized businesses. The share of large enterprises with high and very high digital intensity reaches 35% and 14.9%. While similar indicators for small enterprises are 15.1% and 2.3%, for medium-sized enterprises – 19.6% and 4.6%. Moreover, most of them recorded a low (24.8% and 33.7%) or very low (61.2% and 42.1%) level of digital intensity.

Comparing the Digital Intensity Index of Slovak enterprises with average European indicators, it should be noted that its position in the digital ranking of EU member states remains weak. However, the investment of around 85 million euros included in Slovakia's Recovery and Resilience Plan (RRP) will help businesses digitalize their business processes and provide digital skills training.

Assessing the level of digitalization of Ukrainian business is a difficult task due to the continuation of military operations on its territory and the absence until now of a methodology for calculating the digital intensity index (DII). In this regard, this article proposes to assess the current situation using comparable and accessible indicators of the information society. The unit of measurement for the selected indicators is the percentage of enterprises using a specific digital technology in their activities.

3 Integration of digital technologies at enterprises in Slovakia and Ukraine

To study the degree of integration of digital technologies into business and the comparability of the results of Slovakia and Ukraine, indicators of the information society were selected. The indicators used in the work along with their brief description are presented in Table 2.

Tab. 2 Summary of indicators used to study the degree of digitalization of enterprises in the countries

Technologies	Description	Information Society Indicator
Internet connection	Internet access and transmission speed are treated as basic elements of infrastructure necessary for enterprises to carry out the digitalization process and to implement new technologies that require increasingly faster data transfer rates. (Brodny & Tutak, 2022).	Type of connections to the internet
Cloud computing	Cloud computing is a technology that enables the provision of various hosting services via the Internet. It enables the collection, processing, analysis, and	Purchase of cloud computing services used over the Internet

	visualization of much larger amounts of information data using external computing power. (Patsidis et al., 2023).	
Integration of internal processes	Horizontal and/or vertical integration, through the use of, e.g., ERP and similar systems, is aimed at facilitating and ordering the flow of information in an enterprise. (Kumar & Reinartz , 2018).	Enterprises who have Enterprise Resource Planning (ERP) software package Enterprises using Customer Relationship Management (CRM) software
Artificial intelligence	AI aims to provide the abilities of perception, cognition, and decision-making for machines (Yongjun et al., 2021).	Enterprises that use at least one of AI technologies

Source: own processing

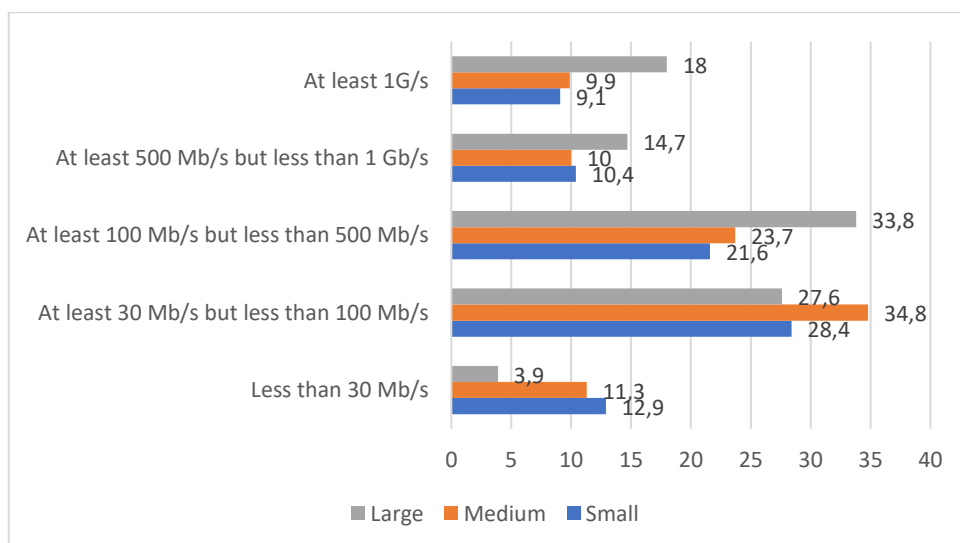
The unit of measurement for the selected indicators is the percentage of enterprises using a specific digital technology in their activities.

3.1 Type of connections to the internet

Digitalization is a complex phenomenon wherein exponential technologies, originating from a selected group of core technological firms, are enabled through data and high-speed connectivity.

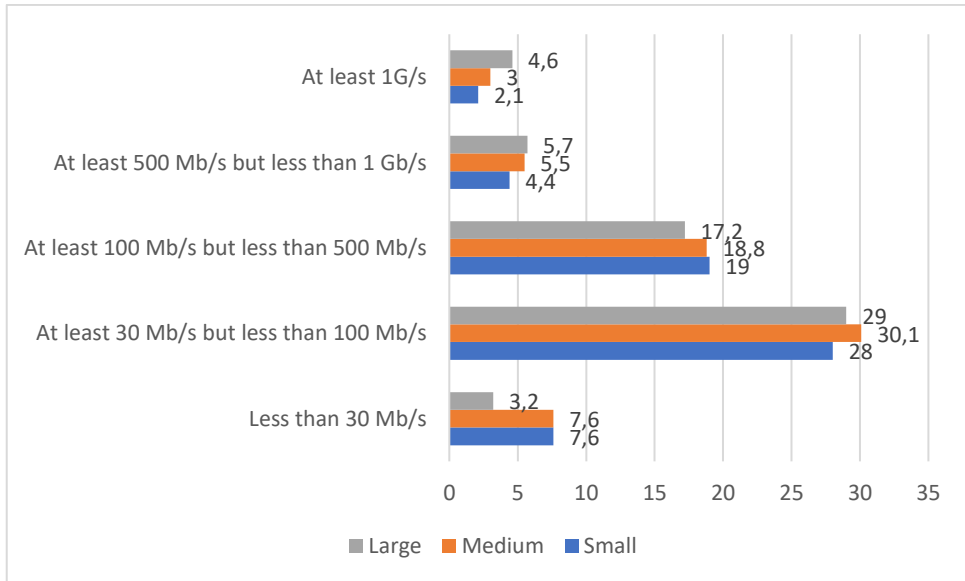
Graphs 1 and 2 present data on the types of Internet connections by class of enterprise in Slovakia (2023) and Ukraine (2022).

Graph 1 Type of connections to the internet by size class of enterprise, Slovakia, 2023 (as of %)



Source: Eurostat Database

Graph 2 Type of connections to the internet by size class of enterprise, Ukraine, 2022 (as of %)



Source: Eurostat Database

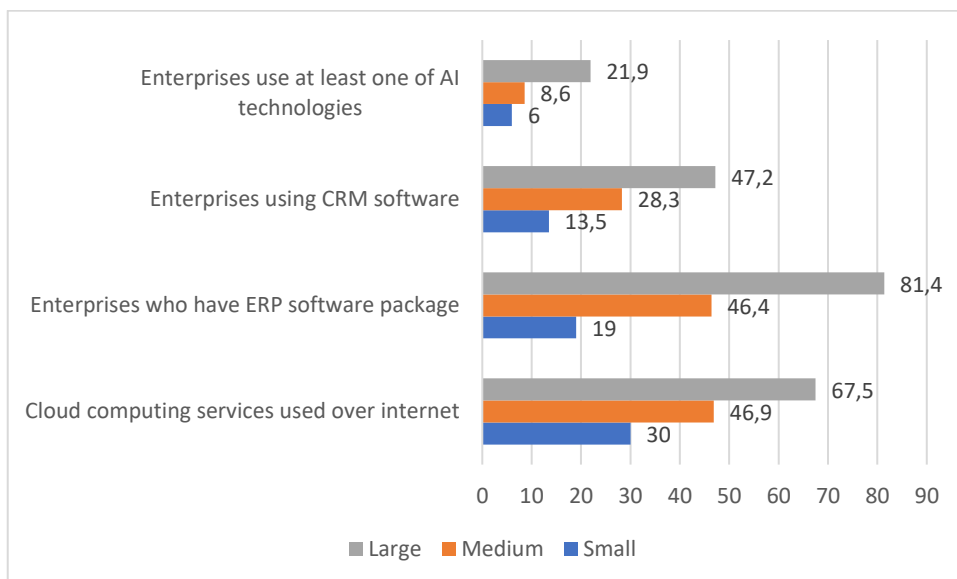
In both countries, large enterprises are more likely to use high-speed connections (for example, speeds greater than 1 Gb/s). In Slovakia this share is 18%, and in Ukraine - 4.6%. Small businesses in both countries tend to use lower-speed connections. For example, in Slovakia, 12.9% of small businesses have a speed of less than 30 Mb/s, while in Ukraine the figure is 7.6%.

It should be noted that in Slovakia access to higher speed connections (500 Mb/s and above) is more common than in Ukraine. For small enterprises, the share of connections with 1 Gb/s is 9.1% versus 2.1% in Ukraine. Ukrainian enterprises, especially small and medium-sized ones, more often use connections with speeds of less than 30 Mb/s.

3.2 Digital technologies for business

For many companies, business process automation is one of the most popular digital technologies and is identified with the implementation of ERP, CRM and other similar systems. The main role in management is played by the enterprise resource planning system (ERP), which provides an information platform for business management.

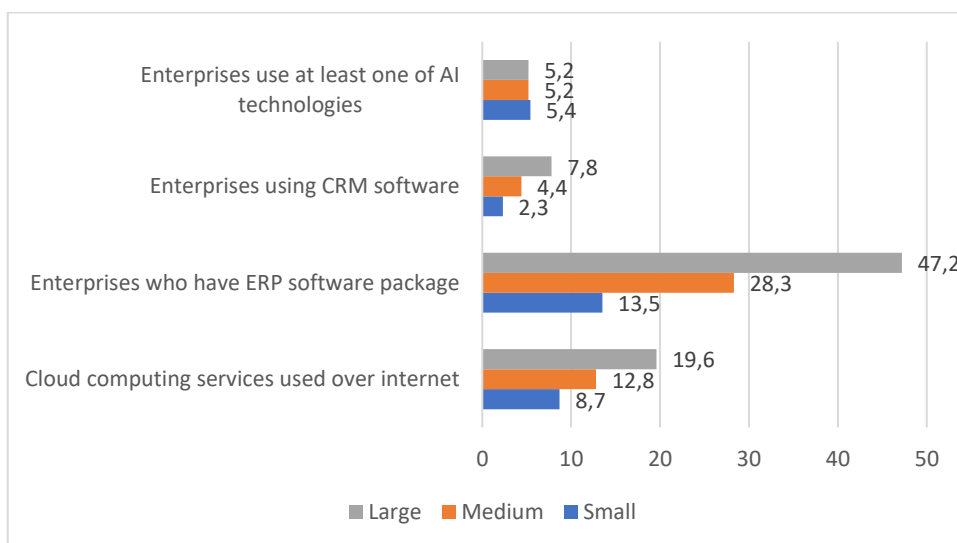
Graph 3 Digital technologies for business by size class of enterprise, Slovakia, 2023 (as of %)



Source: Eurostat Database

ERP systems (Enterprise Resource Planning) in Slovakia have been implemented by 81.4% of large enterprises and 46.4% of medium-sized ones, which is significantly higher than in Ukraine (47.2% of large and 28.3% of medium-sized enterprises). Small businesses in both countries implement ERP much less frequently (19% in Slovakia and 13.5% in Ukraine).

Graph 4 Digital technologies for business by size class of enterprise, Ukraine, 2022



Source: Eurostat Database

Slovak enterprises are significantly more likely to use cloud technologies, especially large companies (67.5%) and medium-sized companies (46.9%). In Ukraine, the level of use of cloud services is much lower: 19.6% for large, 12.8% for medium-sized, and only 8.7% for small enterprises. Cloud computing services allow companies to access computing resources hosted on the Internet by third parties, rather than building or expanding their own IT infrastructure. This represents a significant advantage since building your own infrastructure will entail developing hardware and software.

47.2% of large and 28.3% of medium-sized enterprises in Slovakia use CRM systems, which is significantly higher than in Ukraine (7.8% and 4.4%, respectively). Small businesses in both countries have low levels of CRM adoption (13.5% in Slovakia and 2.3% in Ukraine).

The least used technology in Slovak enterprises is artificial intelligence technology, which is used on average by 21.9% of large enterprises, 8.6% of medium-sized enterprises and 6% of small enterprises. In Ukraine, these figures are 5.2%, 5.2% and 5.4%, respectively.

Conclusion

Analysis of the current level of digitalization of small, medium and large enterprises in Slovakia and Ukraine shows significant differences in selected indicators: type of Internet connection, use of cloud computing, ERP systems, CRM software and artificial intelligence (AI) technologies.

Slovakia is ahead of Ukraine in terms of the level of implementation of digital technologies in all business categories. This is due to a higher level of digital infrastructure, availability of technology and the amount of investment in digitalization.

In terms of the size of enterprises, the highest level of digitalization was found in the group of large enterprises, which is due to their potential and resources. SMEs are significantly behind them in adopting digital tools. The gap varies across technologies and services. The smaller the company, the higher the barriers to digital transformation. The SME adoption gap widens as technologies become more complex or mainstream. The biggest gap is in business process integration (ERP) and procurement of cloud computing services.

References

- Brodny, J. & Tutak, M. (2022). Analyzing the Level of Digitalization among the Enterprises of the European Union Member States and Their Impact on Economic Growth. *Journal of Open Innovation: Technology, Market, and Complexity*, Vol. 8, Issue 2, 2022, 70.
- Eurostat Database. Retrieved November 27, 2024, from https://ec.europa.eu/eurostat/databrowser/view/isoc_e_dii/default/table?lang=en&category=isoc.isoc_e
- Kumar, V. & Werner, R. (2018). *Customer relationship management: concepts, strategy and tools*. Springer Verlag.
- Patsidis, A.; Dyško, A.; Booth, C.; Rousis, A.O.; Kalliga, P.; Tzelepis, D. (2023). Digital Architecture for Monitoring and Operational Analytics of Multi-Vector Microgrids Utilizing Cloud Computing, Advanced Virtualization Techniques, and Data Analytics Methods. *Energies* 2023, 16, 5908.

- Samara, E., Andronikidis, A., Komninos, Y., Bakouros, N., Katsoras, E. (2022). The Role of Digital Technologies for Regional Development: A System Dynamics Analysis *J. Knowl. Econ.* pp.1-23.
- Yongjun, X., Xin, L., Xin, C., Changping, H., Enke, L., Sen, Q. (2021). Artificial intelligence: A powerful paradigm for scientific research, *The Innovation, Volume 2, Issue 4*. Retrieved November 17, 2024, from [https://www.cell.com/the-innovation/fulltext/S2666-6758\(21\)00104-1?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS2666675821001041%3Fshowall%3Dtrue](https://www.cell.com/the-innovation/fulltext/S2666-6758(21)00104-1?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS2666675821001041%3Fshowall%3Dtrue)