ADVANCES IN BUSINESS-RELATED SCIENTIFIC RESEARCH JOURNAL (ABSRJ)

Coffee drinker's perspectives on MSMEs coffee shops: its capability, innovation capability, and purchasing intentions
Virgo Simamora, Lani Dinana Wijaya

Innovative behavior: the role of psychological empowerment Empirical evidence in MSMEs in central Java, Indonesia
Suhana, Anwar Mansyur, Lie Liana, Ali Mursid

The development of digital competences and attitude towards e-learning
Laura Fink, Nataša Makovec, Jaka Vadnjal

Level of technical efficiency of the construction sector in EU countries
Michaela Staňková, Luboš Střelec, Markéta Křetínská

Digital wallet adoption: Worldcoin's impact on financial technology
Tanpat Kraiwanit, Pongsakorn Limna, Peerapat Wattanasin, Papon Moolngearn, Atipon Satranarakun

Double translation: A post-colonial appraisal of management model transition in a multinational company network
Eren Onay, Mehmet Erçek

COFFEE DRINKER'S PERSPECTIVES ON MSMES COFFEE SHOPS: IT CAPABILITY, INNOVATION CAPABILITY, AND PURCHASING INTENTIONS

Virgo Simamora*
Universitas 17 Agustus 1945 Jakarta, Indonesia
virgo.simamora@uta45jakarta.ac.id

Lani Diana Wijaya
Universitas 17 Agustus 1945 Jakarta, Indonesia
lani.wijaya@uta45jakarta.ac.id

Abstract

Enhancing information technology (IT) and innovation capabilities is crucial for micro, small, and medium-sized enterprises (MSMEs) in responding to consumer behavioral changes during the coronavirus disease (COVID-19) pandemic. This study is an explanatory study investigating coffee drinkers' perspectives on the influence of IT and innovation capabilities on their purchasing intentions. The study's population was unspecified number of coffee drinkers in Indonesia. A purposive sampling technique was used to select a sample of 210 coffee drinkers. This survey is accessible only to those who consume at least one cup of coffee daily. A questionnaire was distributed from March 20 to April 24, 2022 to collect data from the eligible respondent. This study found that coffee drinkers' purchase intentions to buy coffee from MSME coffee shops were favorably influenced by technological competence. The findings also revealed the influence of innovation capabilities on purchase intentions among coffee drinkers. This study concludes that IT and innovation capability could be a competitive advantage in coping with a difficult time during the COVID-19 pandemic.

Key Words

Information technology capability; innovation capability; purchasing intentions; MSMEs.

*Corresponding Author

INTRODUCTION

The increase in coffee consumption and production implies significant opportunities in the Indonesian coffee shop business. Five million 60 kg bags of coffee were consumed in Indonesia, a 50.5% increase from 2020 (International Coffee Organization, 2021). Indonesia is one of the top five coffee-consuming countries worldwide. Additionally, coffee production increased by 7%, from 717,962 thousand tons in 2017 to 774,415 thousand tons in 2018 (Haryanto, 2019). An increase followed this phenomenon in the number of coffee shops in Indonesia. According to Haryanto (2019), the number of coffee shops in Indonesia has risen from 1,083 in 2016 to 2,950 in 2019, with a total profit of IDR 10 billion. In other words, the coffee beverage industry is a very attractive market for entrepreneurs, especially micro, small, and medium-sized enterprises (MSMEs).

Consumer behavior has changed because of the coronavirus disease 2019 (COVID-19) pandemic's outdoor activity restrictions, and people are now more comfortable shopping online. According to Sumi and Ahmed (2022), perceived utility, utilitarianism, usefulness, and ease of use are the factors that positively influenced consumers' favorable attitudes and online purchasing behavior.

However, only 19% of MSMEs were digital-based, showing they lacked the capabilities required for online-based practices. Hence, the MSME sector was most impacted by COVID-19 (Baker & Judge, 2020). Due to their smaller size, less extensive operations, and limited access to capital, MSMEs have been among the most vulnerable and dynamic sectors during the pandemic (Ahmed & Sur, 2021). During the COVID-19 pandemic, the sales of MSMEs decreased significantly, from 64.7 million in 2019 to 34 million in 2020. Furthermore, the sales of MSME coffee shops also dropped 70% during the COVID-19 pandemic.

Sing et al. (2022) discovered that MSMEs that increased their use of information technology (IT) during the COVID-19 pandemic could decrease costs and increase their competitiveness. Additionally, Al-Abdallah and Batainneh (2018) and Andrina et al. (2022) discovered that IT capabilities positively affected consumer purchasing intention. Therefore, to thrive, it was crucial to integrate digital technologies (Behl et al., 2022).

Innovation capability (IC) is the ability to innovate, which ensures a firm's advantage over competitors and long-term success (Le & Lei, 2019). In a highly competitive market, IC provides new consumer benefits, reduces substantial costs, and creates unique products that meet customer needs (Slater et al., 2014). Wiratama et al. (2020) found that entrepreneur knowledge is critical in influencing the IC of MSMEs. Based on prior research on innovation, IC provides a competitive advantage as it impacts consumer purchasing intentions (PIs) (Wu & Chen, 2014; Carlina & Ekowati, 2022). As a result, innovative activities are required to enhance an entrepreneur's knowledge to influence an organization's innovation.

The research aims to examine the influence of IT and ICs on customer purchase intentions of MSME coffee shops from the perspective of a coffee drinker. This research is significant because the findings may improve

MSMEs' understanding of IT, which is critical given the urgent need to shift to digital technologies. Furthermore, the study's findings enable MSMEs to increase their understanding of innovation, which is crucial when dealing with a highly competitive market.

LITERATURE REVIEW

Previous research has shown that IT capability (ITC) is an organization's valuable resource as it affects a company's performance (Aydiner, 2017). ITCs are the capabilities to mobilize and deploy IT-based resources in conjunction with other firm resources and capabilities (Liu et al., 2013; Zhang et al., 2008). Therefore, ITCs are valuable due to their compatibility with other firm resources, including business-process and supply-chain management (Peng et al., 2016), management, and human resources (Saunders and Brynjolfsson, 2016). An ITC is a complex collection of IT resources that enable companies to coordinate business activities effectively by mobilizing and deploying these IT-based resources (Bharadwaj, 2000). It describes how an organization's computer system or group of computers and other related technologies can store, process, and send information (Zhu & Nakata, 2007).

Based on previous studies, this study believes that ITC is a valuable resource every business unit needs to help them improve consumers' PIs. MSMEs can enhance their IT skills via business applications like e-promotion tools, reputation communication forums (Simamora et al., 2021), e-catalogs (Rustiarini et al., 2021), and e-marketing and online reviews (Salqaura et al., 2021). In the present research, "information technology capability" is defined as a firm's capability to provide internet and application facilities that consumers see as valuable. Thus, in this study, indicators of MSMEs' IT skills are the access to the internet and the use of applications from the point of view of coffee drinkers.

IC is crucial in a highly competitive market as it provides new consumer benefits, reduces substantial costs, and creates unique products that meet customer needs (Slater et al., 2014). Previous studies have confirmed that IC is valuable as it contributes to an organization's performance (Naala et al., 2017; Donkor et al., 2018). According to Rajapathirana and Hui (2018), IC is the ability to develop new products or services based on market demand. Chang et al. (2012) explain that IC describes an organization's comprehensive capabilities that facilitate the ability to commercialize innovative ideas, processes, products, and services. O'Cass and Sok (2014) stated that IC is all interconnected company process to facilitate and achieve successful product development. Lastly, innovation is a company's ability to generate ideas and turn them into brand-new or improved services or procedures that could benefit the company (Aas & Breunig, 2017). Indicators of IC include the ability to increase the quality of existing products and the capacity to create new products using the most advanced technologies (Sok et al., 2013).

Many factors affect IC in an organization, such as knowledge management practices and organizational culture (Lam et al., 2021), knowledge sharing (Le & Lei, 2019), and the direct involvement of corporate leaders in innovation activities (Bolívar-Ramos et al., 2012; Wang & Dass, 2017). Finally, Wang and Noe (2010) explained that knowledge-sharing and leadership characteristics are the primary resources needed to improve organizational IC.

Referring to the mentioned theoretical framework above, this study defines IC as the capability of MSMEs coffee shops to serve high-quality coffee beverages and create new and unique products according to consumers' perspectives. Therefore, the indicators of MSMEs coffee shop's IC are serving high-quality coffee beverages and creating unique coffee beverages according to the perception of coffee drinkers.

Kotler and Armstrong (2016) defined PIs as a response to a product that shows a consumer's desire to purchase. Consumers are interested in purchasing because they have a positive view of the product (Nulufi & Murwatiningsih, 2015). They have a positive view as they believe the product is valuable. Thus, they want to buy and recommend it to others (Roozy et al., 2014). Many factors influence consumer buying interest, such as product features, brand name, social influence, and cost (Rahim et al., 2016). Since each customer has unique tastes and preferences, the variables that impact their PIs will differ (Lee, 2009). Based on the above-mentioned theoretical understanding, this study defines consumer purchase intention as a customer's positive perception of a product and desire to purchase and recommend it to others. Therefore, the indicators of consumers' PI of MSMEs coffee shops are consumers' desire to buy coffee from MSMEs' coffee shops and recommend the coffee to other consumers.

The effect of ITC on PIs

Previous research conducted by Hausman and Siekpe (2009) explained that IT positively influences consumers' purchase intentions. In the study of Hausman and Siekpe (2009), ITC demonstrates the company's ability to create web interface features that impact consumer interest in exploring the company's website and purchase intention. Moreover, the study of Al-Abdallah and Bataineh (2018) investigated the effect of ITC and e-purchasing intent in the fashion business. In the research of Al-Abdallah and Bataineh (2018), ITC refers to the company's ability to facilitate social networking sites such as e-word of mouth and e-reference groups that impact e-purchasing intention. Furthermore, in the research of Al-Abdallah and Bataineh (2018), the application of e-word of mouth and e-reference groups facilitates consumers' submission of feedback and reviews that impact PI. Finally, Adrina et al. (2021) also proved that ITC affected PI in e-commerce. In the study of Adrina et al. (2021), ITC explains the company's ability to provide IT that is perceived as easy to use, which affects consumers' PIs.

Based on the theoretical framework mentioned above, this study proposes the first hypothesis:

H1: ITC positively impacts consumers' PIs in MSME coffee shops in Jakarta.

The effect of IC on PIs

Previous research by Wu and Chen (2014) explained that IC had an effect on consumers' PIs. According to Wu and Chen's research, products that address environmental challenges, such as energy efficiency and environmentally friendly products, are likely to enhance consumers' PIs with a high level of green marketing awareness. Furthermore, Benachenhou et al. (2018) found the effect of marketing innovation on consumers' buying preferences for the Coca-Cola brand in Tlemcen. According to Benachenhou et al. (2018), Coca-Cola's IC in the brand's visual and verbal packaging has proven to influence consumers' PIs. Finally, the study by Amoako et al. (2018) found the impact of online innovation on repurchase intention in the hotel industry in Ghana. According to Amoako et al. (2018), providing digital platforms is crucial to creating a customer experience that affects repurchase intention.

Based on the theoretical framework above and previous research, this study proposes the second hypothesis:

H2: IC positively impacts consumers' PIs in MSME coffee shops in Jakarta.

METHODS

This study investigated the impact of IT and innovation capabilities on customer purchase intentions in Jakarta MSME coffee shops. The population of this study consists of an unknown number of coffee drinkers in Jakarta. The sample number was 210 > 96, the minimum number of samples required by the Lemeshow formula. All samples in this study met the research's criteria for coffee consumers who consumed at least one cup of coffee each day.

The primary data for this study was collected through an online questionnaire distributed from March 20 to April 24, 2022. Seven indicators were applied for assessing the variables in this study, two for evaluating IT competence, two for measuring IC, and two for measuring purchase intents; all reflecting indicators. Additionally, convergent validity and discriminant validity were used to measure validity, whereas Cronbach's alpha and composite reliability were used to examine reliability. This research used the partial least square (PLS) technique to evaluate the data, using the following analytical steps: (1) assessing the outer model; (2) evaluating the inner model; and (3) hypothesis testing, which was performed by examining the probability value and t statistics.

RESULTS AND DISCUSSION

The profile of respondents

Two hundred and ten people who liked to drink coffee at least one cup daily participated in this research. Table 1 shows that more than half of the respondents were females (56.2%), followed by males (43.8%). Furthermore, most respondents lived in North Jakarta (37.1%), followed by East Jakarta (25.7%).

The majority of respondents were between 31 and 40 years old (33.3%), followed by 20–30 years old (31%), >40 years old (23.8%), and <20 years old (11.9%). Most of the respondents were high school level (42.3%), followed by respondents who graduated from university (33.3%) and have a certificate diploma (23.8%) (see Table 1).

Table 1: Respondent profile

Variable	Total	%
Gender		
Female	118	56.2
Male	92	43.8
Age		
- <20	25	11.9
- 20–30	65	31
- 31–40	70	33.3
- >40	50	23.8
Education		
- High school	89	42.3
- Diploma	50	23.8
- Bachelor	71	33.8

Evaluating the measurement model

The first step in PLS analysis was assessing the measurement model. In the first step, the model was assessed to verify the relationship between the latent variable and its indicators. The assessment was based on reliability and validity tests. Using the Smart PLS application, the following PLS algorithm model is generated.

Figure 1: PLS algorithm model
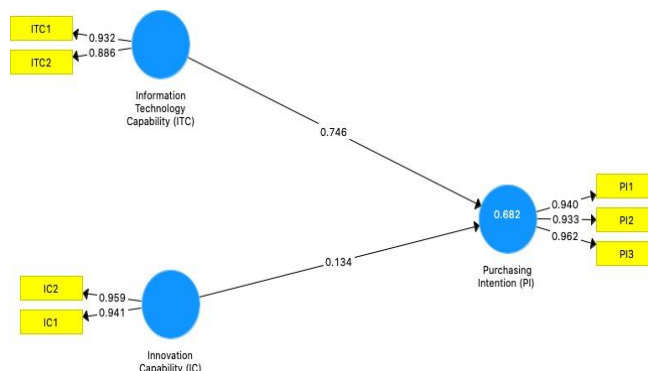
Validity test

Validity test aims to determine how effectively the instrument can execute its function measuring instrument. The first instrument to examine the validity test was the convergent validity, based on the value of loading factors. Ghozali (2021) stated that the minimum loading factor that satisfies the convergent validity is 0.7. The convergent validity requirements have been fulfilled while the loading factors are greater than 0.7 (see Figure 1).

The second instrument was applied to examine the validity of this study, called discriminant validity. The evaluation was based on cross-loading and the Fornell–Larcker criteria. According to Ghozali (2021), to completely satisfy discriminant validity, the value of each item on the construct is higher than cross-loading, the value of AVE is >0.5, and the square root of the AVE of each construct is greater than the correlation of latent construct (Fornell–Larcker criteria).

Table 2: Factor loading

Indicators	ITC	IC	PI
ITC1	0.932	0.482	0.827
ITC2	0.886	0.517	0.644
IC1	0.457	0. 941	0.466
IC2	0.569	0.959	0.553
PI1	0.724	0.516	0.940
PI2	0.796	0.472	0.933
PI3	0.457	0.549	0.962

Table 3: Average variance extracted

Construct	AVE
ITC	0.827
IC	0.903
PI	0.892

Table 4: The Fornell–Larcker Criterion

	ITC	IC	PI
ITC	0.910		
IC	0.545	0.950	
PI	0.818	0.540	0.945

This study's results show that each indicator's loading value was greater than the value of cross-loading (see Table 2). Furthermore, the AVE of each construct was higher than 0.5 (see Table 3). Lastly, this study's results found

that the AVE's square root for each construct was greater than the correlation with other constructs (see Table 4).

Reliability test

The reliability test aims to assess the degree to which measurement instruments can provide reliable data. Ghozali (2021) stated that the minimum acceptable value of Cronbach's alpha and composite reliability to meet reliability requirements is 0.70. The reliability test was conducted using Cronbach's alpha and composite reliability as follows:

Table 5: Cronbach's alpha and composite reliability

Cronbach's alpha	Composite reliability
0.794	0.905
0.893	0.949
0.940	0.962

All values of Cronbach's alpha and composite reliability were above 0.70; therefore, the reliability requirement was acceptable. Hence, the measurement model was reliable.

Evaluating the structural model

The next step of PLS analysis was assessing the structural model. The assessment aims to predict causal relationships (cause-and-effect relationships) between latent variables. The analysis was conducted with the bootstrapping analysis procedure to evaluate the path coefficient value.
    Based on the results, the path coefficient of correlation between ITC and PI was 0.746 with p-values of $0.0000 < 0.05$ (see Table 6), indicating a significant relationship between ITC and PI. Furthermore, the path coefficient of correlation between IC and PI was 0.134 with a p-value of $0.000 < 0.05$ (see Table 7), indicating a significant relationship between ITC and PI.

Table 6: Path coefficient

	Original sample (O)	Sample mean (M)	Standard deviation	T statistics	p-value
ITC→PI	0.746	0.745	0.057	13.104	0.000
IC→PI	0.134	0.135	0.065	2.050	0.041

Table 7: The value of R^2

	R2	R2 adjusted
PI	0.682	0.679

The further evaluation of the structural model using the R-square criteria explains the variance in the endogenous variable defined by the exogenous variables. According to Chin et al., (2010), the recommended values of R^2 square for endogenous are 0.67, 0.33, and 0.19, respectively, indicating the changes are substantial, moderate, and weak. This study found that the value R was 0.682, suggesting that IT and ICs caused 68.2% of the changes in PIs, and the rest were caused by other variables not examined in this study (see Table 7).

DISCUSSION

This study shows that ITC is an important aspect that affects customers' PIs at MSME coffee shops in Jakarta. This research confirms the findings of Hausman and Siekpe (2009), Al-Abdallah and Bataineh (2018), and Adrina et al. (2021). In Hausman and Siekpe's research (2009), ITC is a company's capacity to develop web interface features that influence consumer desire to explore the company's website and increase purchase intentions. According to Al-Abdallah and Bataineh (2018), IT is a firm's capability to support social networking sites, such as e-word of mouth and e-reference groups, which influence e-PIs. Finally, Adrina et al. (2021) defined ITC as a company's ability to deliver easy-to-use technology, which impacts customers' purchasing preferences.

Additionally, this study found that IC was essential as it positively influenced customers' purchase intentions. The findings support previous research by Wu and Chen (2014), Benachenhou et al. (2018), and Amoako et al. (2018), which discovered the effect of IC on customers' purchase intentions. According to Wu and Chen's study, products that addressed environmental issues, such as energy efficiency and environmentally friendly products, were likely to increase customers' purchase intentions who had strong marketing green marketing awareness. In the research of Benachenhou et al. (2018), IC referred to the Coca-Cola company's ability to design a visual element and informative text for Coca-Cola packaging that influenced customer purchasing interest in Tlemcen. In the research conducted by Amoako et al. (2018), IC referred to the hotel industry's digital platform, which improved online purchasing innovation in Ghana.

The first issue arised as a result of this research was the need to enhance capabilities related to IT. This was important because it enabled MSMEs to engage in digital business with the wide variety of digital business applications available on e-commerce platforms. E-word of mouth (Fan & Miao, 2012), online reviews (Thomas et al., 2019), brochures, and virtual reality (Kiliç et al., 2021) are some of the digital business applications that have a positive effect on consumers' purchase intentions. Giving MSMEs access to the internet and digital business applications will increase their chances of successfully marketing their goods (Astuti et al., 2020). Additionally, it helps MSMEs deal with the changing behaviors of consumers, who prefer to shop for goods on the internet. This was especially important during the COVID-19 pandemic, when community activities were restricted

(Özbay & Ozcan, 2021). Finally, because of the consistently rapid growth of internet penetration, the Indonesian market is entering the era of digitalization, which means that ITCs are becoming valuable resources for every organization to improve organizational performance. This is because of the rapid growth of internet penetration (Turulja & Bajgorić, 2016).

The second issue that can be drawn from this research was the finding that a company's capacity for innovation significantly influences consumers' PIs. This argument gives credibility to the conclusions reached by previous studies of Naala et al. (2017) and Donkor et al. (2018) which found the effect of IC on business performance. Additionally, the argument supports the findings of Suroso et al. (2021), who found that the capability of innovation is an invaluable asset for MSMEs when coping with highly competitive markets. Since Lin and Lee (2005) and Lam et al. (2021) stated that knowledge management is a source of IC, MSMEs need to focus on improving their knowledge management capabilities to increase their IC. However, in Indonesia, the development of IC in MSMEs is unfortunately impeded by a lack of knowledge management in MSMEs (Suroso et al., 2021). MSMEs can start by increasing workers' self-belief and encouraging them to share knowledge (Lin, 2007). Finally, in an economy driven by digital technology, big data's capabilities and offerings have been relentlessly empowering organizations' knowledge management platforms to simplify knowledge management practices such as acquiring, creating, sharing, storing, and transferring information (Behl, et al., 2022). This helps organizations meet their short-term and long-term goals and accelerate their path toward success (Jha & Sahoo, 2021). Lastly, innovation activities require the support of leaders committed to guiding those activities toward developing innovation capabilities (Bolívar-Ramos et al., 2012; Wang and Dass, 2017). Within the scope of this inquiry, the phrase "head of the coffee shop" can refer to either the business's proprietor or the establishment's manager.

Workers' confidence in engaging the information sharing is increasing as knowledge management drives innovation. With the use of big data facilities and organizational commitment, innovation capacity may become a source of innovation, enabling MSMEs to deliver high-quality coffee beverages and create new and unique flavors of coffee based on customer feedback.

CONCLUSIONS

According to this research, ITC significantly affected purchase intentions from the viewpoint of coffee drinkers. Consequently, MSMEs must shift to digital technologies to respond to the behavioral changes of customers, who increasingly prefer to shop online. MSMEs may develop their ITCs by providing internet connection to their customers and using easy available applications to promote consumer interest in their coffee shops. Similarly, this study found the influence of innovation capacity on consumers' PIs among coffee drinkers. Hence, MSMEs coffee shops may use innovation to

gain a competitive advantage by improving the quality of their coffee beverage and creating a distinct flavor of coffee.

REFERENCES

Aas, T. H., & Breunig, K. J. (2017). Conceptualizing innovation capabilities: A contingency perspective. Journal of Entrepreneurship, Management and Innovation, 13(1), 7–24.

Ahmed, S., & Sur, S. (2021). Change in the uses pattern of digital banking services by Indian rural MSMEs during demonetization and Covid-19 pandemic-related restrictions. Vilakshan-XIMB Journal of Management.

Al-Abdallah, G. M., & Bataineh, A. Q. (2018). Social networking sites and fashion e-purchasing process. Journal of Business and Retail Management Research, 13(2), 36–48. https://doi.org/10.24052/jbrmr/v13is02/art-04

Amoako, G. K., Doe, J. K., & Neequaye, E. K. (2021). Online innovation and repurchase intentions in hotels: the mediating effect of customer experience. International Hospitality Review, 37(1), 28-47. https://doi.org/10.1108/ihr-02-2021-0008

Andrina, A. A. A. P., Kurniadi, C. J., Kenang, I. H., & Sutrisno, T. F. (2022). The role of technology acceptance model factors on purchase intention in e-commerce. BISMA (Bisnis dan Manajemen), 14(2), 160–176. https://doi.org/10.26740/bisma.v14n2.p160-176

Astuti, R. P., Kartono, K., & Rahmadi, R. (2020). Pengembangan UMKM melalui Digitalisasi Tekonolgi dan Integrasi Akses Permodalan. ETHOS: Jurnal Penelitian dan Pengabdian kepada Masyarakat, 8(2), 248-256. https://doi.org/10.29313/ethos.v8i2.5764

Aydiner, A. S. (2017). Linking information system capabilities with firm performance: A review of theoretical perspectives and new research agenda. International Journal of Research in Business and Social Science (2147-4478), 6(1), 55–64. https://doi.org/http://dx.doi.org/10.20525/ijrbs.v6i1.656

Baker, T. H., & Judge, K. (2020). How to help small businesses survive COVID-19. Columbia Law and Economics Working Paper, (620).

Behl, A., Gaur, J., Pereira, V., Yadav, R., & Laker, B. (2022). Role of big data analytics capabilities to improve sustainable competitive advantage of MSME service firms during COVID-19–A multi-theoretical approach. Journal of Business Research, 148, 378–389.

Benachenhou, S., Guerrich, B., & Moussaoui, Z. (2018). The effect of packaging elements on purchase intention: case study of Algerian customers. Management Science Letters, 8(4), 217-224. https://doi.org/10.5267/j.msl.2018.2.004

Bharadwaj, A. S. (2000). A resource-based perspective on information technology capability and firm performance: an empirical investigation. MIS quarterly, 24(1), 169–196. https://doi.org/10.2307/3250983

Bolívar-Ramos, M. T., Garcia-Morales, V. J., & García-Sánchez, E. (2012). Technological distinctive competencies and organizational learning: Effects on organizational innovation to improve firm performance. Journal of engineering and technology management, 29(3), 331-357. https://doi.org/10.1016/j.jengtecman.2012.03.006

Carli–a, G., & Ekowati, S. (2022). Pengaruh Kreativitas Dan Inovasi Terhadap Minat Beli Konsumen Bakso O'Boss Di Kota Bengkulu. EKOMBIS REVIEW: Jurnal Ilmiah Ekonomi dan Bisnis, 10(2), 599-608. https://doi.org/10.37676/ekombis.v10i12

Chang, Y. C., Chang, H. T., Chi, H. R., Chen, M. H., & Deng, L. L. (2012). How do established firms improve radical innovation performance? The organizational capabilities view. Technovation, 32(7-8), 441–451.

Chin, W. W., Vinzi, V. E., Henseler, J., & Wang, H. (2010). Handbook of partial least squares: Concepts, methods and applications. Germany: Springer.

Donkor, J., Donkor, G. N. A., Kankam-Kwarteng, C., & Aidoo, E. (2018). Innovative capability, strategic goals and financial performance of SMEs in Ghana. Asia Pacific Journal of Innovation and Entrepreneurship, 12(2), 238–254. https://doi.org/10.1108/apjie-10-2017-0033

Fan, Y. W., & Miao, Y. F. (2012). Effect of electronic word-of-mouth on consumer purchase intention: The perspective of gender differences. International Journal of Electronic Business Management, 10(3), 175–181.

Ghozali, I. (2021). Partial Least Squares, Konsep, Teknik, dan Aplikasi Menggunakan Program SmartPLS 3.2.9. Semarang: Universitas Diponegoro.

Haryanto. 2019. Riset TOFFIN: Bisnis Kedai Kopi Makin Menggeliat di 2019. Industry. Retrieved from: https://www.industry.co.id/read/58786/riset-toffin-bisnis-kedai-kopi-makin-menggeliat-di-2019

Hausman, A. V., & Siekpe, J. S. (2009). The effect of web interface features on consumer online purchase intentions. Journal of Business Research, 62(1), 5–13. https://doi.org/10.1016/j.jbusres.2008.01.018

International Coffee Organization. (2021). November 2020 Market Report-E-attachment. International Coffee Organization. https://www.ico.org/news/November%202020%20Market%20Report-E-attachment.pdf f

Jha, R. S., & Sahoo, P. R. (2021). Influence of big data capabilities in knowledge management—MSMEs. Paper Presented at ICT Systems and Sustainability: Proceedings of ICT4SD 2020, Volume 1 (pp. 513-524). Springer Singapore. https://doi.org/10.1007/978-981-15-8289-9_50

Kiliç, İ., Doğantekin, A., & Yasar, S. A. R. I. (2021). The Effect of Brochure and Virtual Reality Goggles on Purchasing Intention in Destination Marketing. Advances in Hospitality and Tourism Research (AHTR), 9(2), 313–340. https://doi.org/10.30519/ahtr.784131

Kotler, P., & Amstrong, G. (2016). Prinsip-Prinsip Pemasaran, Jilid 1 (16 Ed.). Jakarta: Erlangga

Lam, L., Nguyen, P., Le, N., & Tran, K. (2021). The relation among organizational culture, knowledge management, and innovation capability: Its implication for open innovation. Journal of Open Innovation: Technology, Market, and Complexity, 7(1), 1–16.

Le, P. B., & Lei, H. (2019). Determinants of innovation capability: the roles of transformational leadership, knowledge sharing and perceived organizational support. Journal of knowledge management, 23(3), 527-547. https://doi.org/10.1108/JKM-09-2018-0568

Lee, S. H. (2009). How do online reviews affect purchasing intention?. African Journal of Business Management, 3(10), 576–581.

Lin, H. F. (2007). Knowledge sharing and firm innovation capability: an empirical study. International Journal of manpower, 28(3/4), 315–332.

Lin, H. F., & Lee, G. G. (2005). Impact of organizational learning and knowledge management factors on e-business adoption. Management Decision, 43(2), 171–188.

Liu, H., Ke, W., Wei, K. K., & Hua, Z. (2013). The impact of IT capabilities on firm performance: The mediating roles of absorptive capacity and supply chain agility. Decision support systems, 54(3), 1452-1462. https://doi.org/10.1016/j.dss.2012.12.016

Naala, M., Nordin, N., & Omar, W. A. B. W. (2017). Innovation capability and firm performance relationship: A study of pls-structural equation modeling (Pls-Sem). International Journal of Organization & Business Excellence, 2(1), 39–50.

Nulufi, K., & Murwartiningsih, M. (2015). Minat Beli sebagai Mediasi Pengaruh Brand Image dan Sikap Konsumen terhadap Keputusan Pembelian Batik di Pekalongan. Management Analysis Journal, 4(2), 129–141.

O'Cass, A., & Sok, P. (2012). Examine the role of functional area resource-capability complementarity in achieving customer and product-based performance outcomes. Journal of Strategic Marketing, 20:4, 345-363. https://doi.org/10.1080/0965254X.2011.643918

Özbay, F., & Özcan, A. (2021). The examined of the influence of COVID-19 on e-commerce and consumer behavior: A study on Turkey. Aydın İktisat Fakültesi Dergisi, 6(1), 21–33.

Peng, J., Quan, J., Zhang, G., & Dubinsky, A. J. (2016). Mediation effect of business process and supply chain management capabilities on the impact of IT on firm performance: Evidence from Chinese firms. International journal of information management, 36(1), 89–96. https://doi.org/10.1016/j.ijinfomgt.2015.09.006

Rahim, A., Safin, S. Z., Kheng, L. K., Abas, N., & Ali, S. M. (2016). Factors influencing purchasing intention of smartphone among university students. Procedia Economics and Finance, 37, 245–253. https://doi.org/10.1016/s22125671(16)30121-6

Rajapathirana, R. J., & Hui, Y. (2018). Relationship between innovation capability, innovation type, and firm performance. Journal of Innovation & Knowledge, 3(1), 44–55. https://doi.org/10.1016/j.jik.2017.06.002

Roozy, E., Arastoo, M. A., & Vazifehdust, H. (2014). Effect of brand equity on consumer purchase intention. Indian Journal of Science Research, 6(1), 212–217.

Rustiarini, N. W., Anggraini, N. P. N., & Satwam, I. K. S. B. (2021). Perancangan Katalog Produk Untuk Meningkatkan Penjualan UMKM. JMM (Jurnal Masyarakat Mandiri), 5(5), 2615–2624. https://doi.org/10.31764/jmm.v5i5.5296

Salqaura, S. A., Sipayung, R. C., & Salqaura, S. S. (2021). E-Marketing dan Keunggulan Kompetitif terhadap Kinerja Pemasaran dengan Online Review sebagai Variabel Moderating. JKBM (Jurnal Konsep Bisnis dan Manajemen), 8(1), 26–36. https://doi.org/10.31289/jkbm.v8i1.5449

Saunders, A., & Brynjolfsson, E. (2016). Valuing information technology related intangible assets. Mis Quarterly, 40(1), 83-110. https://doi.org/10.25300/MISQ/2016/40.1.04

Simamora, V., Kiak, N. T., & Muga, M. P. L. (2021). The effect of celebrity endorsement and the reputation of the @ootd fess forum on consumer buying interest in fashion products among millennials. JMM17: Jurnal Ilmu Ekonomi Dan Manajemen, 8(02), 58–66. https://doi.org/10.30996/jmm17.v8i02.5627

Slater, S. F., Mohr, J. J., & Sengupta, S. (2014). Radical product innovation capability: Literature review, synthesis, and illustrative research propositions. Journal of product innovation management, 31(3), 552-566. https://doi.org/10.1111/jpim.12113

Sumi, R. S., & Ahmed, M. (2022). Investigating young consumers' online buying behavior in COVID-19 pandemic: perspective of Bangladesh. IIM Ranchi, journal of management studies, 1(2), 108-123. https://doi.org/10.1108/IRJMS-09-2021-0123

Suroso, S., Novitasari, D., Nugroho, Y. A., Chidir, G., & Asbari, M. (2021). Managing MSME Innovation Performance: Analysis of Knowledge-Oriented Leadership and Knowledge Management Capability. Edukatif: Jurnal Ilmu Pendidikan, 3(6), 4541–4555.

Thomas, M. J., Wirtz, B. W., & Weyerer, J. C. (2019). Determinants of Online Review Credibility and Its Impact On Consumers'purchase Intention. Journal of Electronic Commerce Research, 20(1), 1–20.

Turulja, L., & Bajgorić, N. (2016). Human resources or information technology: What is more important for companies in the digital era?. Business Systems Research: International journal of the Society for Advancing Innovation and Research in Economy, 7(1), 35–45.

Wang, S., & Noe, R. A. (2010). Knowledge sharing: A review and directions for future research. Human resource management review, 20(2), 115–131.

Wang, X., & Dass, M. (2017). Building innovation capability: The role of top management innovativeness and relative-exploration orientation. Journal of Business Research, 76, 127–135. https://doi.org/10.1016/j.jbusres.2017.03.019

Wiratama, N. A. D., Rahmadi, M. A., Cahyadi, V., & Candra, S. (2020). Analysis the Effect of Entrepreneurship and Innovation in Food and Beverage SMEs in Jakarta. Paper presented at Proceedings of the 7th North American International Conference on Industrial Engineering and Operations Management, Orlando, Florida, USA, June 12–14, 2204–2213.

Wu, S. I., & Chen, Y. J. (2014). The impact of green marketing and perceived innovation on purchase intention for green products. International Journal of Marketing Studies, 6(5), 81–100. https://doi.org/10.5539/ijms.v6n5p81

Zhang, M., Sarker, S., & Sarker, S. (2008). Unpacking the effect of IT capability on the performance of export-focused SMEs: a report from China. Information Systems Journal, 18(4), 357–380. https://doi.org/10.1111/j.1365-2575.2008.00303.x

Zhu, Z., & Nakata, C. (2007). Reexamining the link between customer orientation and business performance: The role of information systems. Journal of marketing theory and practice, 15(3), 187–203. https://doi.org/10.2753/MTP1069-6679150301

INNOVATIVE BEHAVIOR: THE ROLE OF PSYCHOLOGICAL EMPOWERMENT EMPIRICAL EVIDENCE IN MSMEs IN CENTRAL JAVA, INDONESIA

Suhana Suhana*
Universitas Stikubank,
Indonesia
suhana@edu.unisbank.ac.id

Anwar Mansyur
Universitas Stikubank,
Indonesia
a.n.mansyur@edu.unisbank.ac.id

Lie Liana
Universitas Stikubank,
Indonesia
lieliana@edu.unisbank.ac.id

Ali Mursid
Bank BPD Jateng School of
Economics and Business,
Indonesia
ali.mursyid14@gmail.com

Abstract

This study aims to explore the antecedents of psychological empowerment and its consequences. Employees of micro, small, and medium enterprises in Semarang City, Central Java, Indonesia, comprised this study's population. This study's sample size was 158 respondents from various business sectors. Food and beverages, beauty care, massage services, financial services, grocery, and other industries are included. Quota sampling was utilized as a sampling technique. The data were processed using structural equation models. The result indicated that transformational leadership positively affect on psychological empowerment. Knowledge sharing is significantly influenced by psychological empowerment. Other findings include the fact that psychological empowerment has a strong favorable effect on job performance and innovative behavior. This study has theoretical and managerial consequences.

Key Words

Transformational leadership; psychological empowerment; innovative behavior; knowledge sharing; job performance.

*Corresponding Author

INTRODUCTION

The environment in which organizations operate is becoming more dynamic. Organizations that are creative and innovative are more likely to survive and thrive. The behavior of an organization's members will determine its level of innovation. Individual-initiated behavior is defined as new ideas being generated, created, developed, promoted, and executed to increase performance (Konermann, 2012).

Innovative behavior (IB) is critical for gaining a competitive edge (Martins & Terblanche, 2003). Organizations operating in a highly competitive business climate require IB to please customers and maintain a competitive position in the marketplace. Leaders are the most essential component in encouraging workplace innovation (Javed et al., 2019).

The most important predictor of IB is leadership (Jung et al., 2008). According to Conger (1999), one of the most powerful variables in promoting organizational innovation is transformational leadership (TL). TL increases work capacity and stimulates people's creativity. Conversely, the association between TL and IB is still unrobust. Some study findings on TL and IB are contradictory (Shin & Zhou, 2003). This condition promotes future research into the mediating and moderating elements existing between them. Organizations must use processes to improve organizational and employee results. Psychological empowerment (PE) is relevant in this situation (Lu et al., 2018).

PE is a key factor in explaining IB. A number of previous study have found that TL is the predictor of PE. Previous research has also found that PE is key in enhancing IB(Marane, 2012). PE refers to a person's cognitive condition characterized by a sense of authority, great motivation, and high skill in meeting work objectives (Spreitzer, 1995). Empowered employees will exhibit more innovative behavior. However, Kmieciak et al. (2012) discovered the different one. IB is not affected by PE. This gap is worth investigating to create a clearer theoretical understanding of the link between these two factors.

Moreover, PE has an effect on knowledge sharing (KS). This finding is congruent with the findings of Amichai-Hamburger et al. (2008) that PE is becoming increasingly significant in studying the effectiveness of social systems designed to encourage knowledge and information sharing. Job performance (JP) is also affected by PE. Conversely, the empirical evidence of a direct association between PE and performance quite varies (Chen et al., 2007). This indication urges academics to investigate these two variables to develop a clearer theoretical depiction of their relationship.

Thus, this study investigates the causes and implications of PE, and the specific goals of this study are to explore the effects of TL on PE, KS, JP and IB.

LITERATURE REVIEW

Transformational Leadership and Psychological Empowerment

TL emphasizes cooperation, collaborative task completion, learning from shared experiences, and delegation of authority to conduct ideas to improve employee participation in idea formulation and execution (Gumusluŏlu & Ilsev, 2009). TL has an empowering effect (Daft, 2021). This leadership develops a work atmosphere in which employees are encouraged to empower themselves.

Meanwhile PE manifests itself in four dimensions: meaning, self-efficacy, impact, and self-determination. It refers to an organizational member's positive psychological attitude, anticipation, and belief that he or she will be able to shape the job. Additionally, it is facilitated by TL. According to Avolio et al. (2004), transformational leaders strengthen their psychological empowerment by increasing their self-confidence and personal development through personalized consideration. Transformational leaders also challenge and bring meaning to subordinates' work, improving organizational members' psychological empowerment (Avolio et al., 2004; Jung et al., 2002).

Of the elaboration, the first hypothesis is:

H1: Transformational leadership positively affects on psychological empowerment.

Psychological Empowerment and Knowledge Sharing

Knowledge sharing (KS) is influenced by PE. Psychologically empowered employees tend to sharing more knowledge than those who are not. Employees will be more involved in knowledge-sharing activities if they feel psychologically empowered. Individuals who are competent in their employment will also share more knowledge than that of less competent individuals (Barling et al., 1996). According to the findings of Muhammed (2006), PE plays a crucial role in shaping knowledge management methods. Meanwhile KS is a byproduct of knowledge management.

Other research findings indicate that psychologically empowered employees are likely to share knowledge (Srivastava et al., 2006). Employees believe that they have more freedom and opportunities to experiment with and share fresh ideas if they are psychologically empowered. According to Locke et al. (1997), engagement in decision-making provides possibilities for employees to share knowledge, which increases knowledge-sharing activities.

For Kang et al. (2017), KS is a form of proactivity. Given that PE motivates individuals to perform better on proactive activities across multiple domains in their professional duties, certain levels of PE will influence KS. To foster KS, PE is required.

According to the prior elaboration, the second hypothesis is as follows:

H2: Psychological empowerment positively affects on knowledge sharing.

Psychological Empowerment and Job Performance

Meaning is a crucial aspect of PE. Individuals who believe that the work is vital to other people and the organization will perform better (Liden et al., 2000). Similarly, persons believing they have skills for the work they undertake will do well. PE influences not only the individuals's professional position but also the work environment. Work meaning can raise awareness on the importance of work, motivating them to perform better (Spreitzer, 1995). In a meta-analysis, Stajkovic and Luthans (1998) discovered a substantial relationship between self efficacy and job performance (JP). Employees with self-determination at work will respond to each scenario as it arises, and those who have a say in the outcome of their job will work harder to persuade their coworkers and affect their work unit direction. These features of PE motivate employees to accomplish their job as quickly as possible (Li et al., 2015). Employees will see the importance of their work if they are satisfied with it. Similarly, if employees understand that their job has an impact on their coworkers, they will perform well. The findings of Chow et al. (2006) reflect the previous findings that PE is highly connected to JP.

Furthermore, the literature describes the outcomes of PE as good and affecting JP. The empowerment construct explains how and why job of an employee acts as an incentive to empower, driving employee behavior that is ultimately linked to job performance (Harris et al., 2009). Moreover, PE leads to increased job efficacy, achievement and success, and improved performance.

As a result, the third hypothesis is:

H3: Psychological empowerment positively affects on job performance.

Psychological Empowerment and Innovative Behavior

Individual cognitive beliefs or motivational statements regarding authority inside the organization are the focus of PE (Seibert et al., 2011). PE is a motivating paradigm with four elements pertaining to an employee's attitude and role at work, namely, meaning, competence, impact, and self-determination. Job meaningfulness refers to the close link that employees have with their jobs (Farzaneh et al., 2014). Meaningful feelings will emerge, and then encourage employees more innovative at work (Chiang & Hsieh, 2012). Meanwhile, competence refers to a one's belief in their ability to perform their work and obligations well. Perceived autonomy allows employees to try out new ideas and is favorably associated with IB (de Jong & Kemp, 2003).

IB is a type of individual-level innovation that is critical for increasing competitive advantage. Individuals must be able to work outside of their usual activities, such as discovering new technologies, applying new working techniques, and doing studies to put new ideas into action (De Jong & Den Hartog, 2010).

As a result, our hypothesis is as follows:

H4: Psychological empowerment is associated with innovative behavior.

METHODS

This is an explanatory research which tests the stated theory. Therefore, the research findings will likely strengthen the theoretical framework. Meanwhile, this study's data sources comprise both primary and secondary sources. Primary data are information gathered directly from research respondents. Questionnaires are delivered to selected respondents to collect primary data. Meanwhile, secondary data are gathered from sources other than the research item.

Measures

The respondents in this study are employees of MSMEs in Semarang, Central Java, Indonesia. MSMEs with at least five employees meet the criteria for the research population. The sample size for the structural equation model was 158 people. The respondents work in various industries, such as food, and beverages, beauty care, massage services, financial services, grocery, and others. We used nonprobability sampling as our sampling technique, which does not provide the same opportunity to the sample population. The study utilized quota technique, in which a population with specific characteristics is sampled until the quota is met. The AMOS version 21 software program is used for structural equation modeling in the data analysis technique.

This study's variables include TL, PE, KS, IB, and JP. The transformational leadership questionnaire was adapted from Vuori and Okkonen (2012). Spreitzer's (1995) questionnaire was used for the psychological empowerment questionnaire items, whereas Vuori and Okkonen's (2012) questionnaire was used for measuring the knowledge-sharing variable. De Jong and Den Hartog (2010) questionnaire was used to assess innovative behavior. The job performance questionnaire was adapted from the questionnaire of Dyne et al. (2014).

FINDINGS

Respondents' Sociodemographic Profile

The researcher reported the respondents' sociodemographic profile, which included gender, age, education level, work experience, and business field.

In this survey, the respondents were 80 women and 78 men. Among the respondents, 81 (51.3%), 45 (28.5%), 24 (15.2%), and 8 (5%) respondents were <30, 30–40, 41–50, and >50 years old, respectively. In terms of educational attainment, 91 (57.7%), 12 (7.8 %), and 23 (14.5%) respondents were high school, junior high school, and bachelor's degree graduates, respectively. In terms of job experience, 90 (57%), 40 (25.3%), 13 (8.2%), and 15 (9.5%) respondents have <5, 5–10, 10–15, and >15 years, respectively. Although the business fields in which respondents work vary, the food, and beverage, massage service, financial service, and beauty care sectors account for 84 (53.2%), 15 (9.5%), 9 (5.7%), and 9 (5.7%) of all respondents, respectively. Respondents working in electronics and food stores accounted for 5% of the total, with the remaining industries accounting for <5%. Table 1 contains information about the respondents' sociodemographic characteristics.

Table 1. Respondents Characteristics

		N	%
Gender	Men	71	44.9
	Women	87	55.1
Age	< 30 years	81	51.3
	> 0–40 years	45	28.5
	41–50 years	24	15.2
	>50 years	8	5
Education	Junior high school	44	27.8
	Senior high school	91	57.7
	Undergraduate	23	14.5
Experience of work	<5 years	90	57.0
	5 –< 10 years	40	25.3
	≥ 10–15 years	13	8.2
	> 15 years	15	9.5
Business sector	Accessories	5	3.2
	Culinary	84	53.2
	Financial services	9	5.7
	Herbs	7	4.4
	Textiles	6	3.8
	Beauty care	9	5.7
	Electronics	8	5.0
	Massage	15	9.5
	Wholesale	8	5.0
	Pet shop	7	4.5

Common Method Variance (CMV)

This study detected CMV, constructed anonymous questionnaires, and randomized the scale item (Podsakoff et al., 2003). Furthermore, for each tested construct, the questionnaires issued to respondents were explained in detail. This study examined Common Latent Factor (CLF) to determine

the presence of CMV using single factor of Harman. The results of Harman's single factor analysis provided a good explanation of the first factor which was smaller than 50.00% (40.84%). The CLF loading factor analysis revealed that the result reached .39, indicating a CMV variance of 1.52%.

Confirmatory Factor Analysis (CFA) Results

This study used the structural equation modeling analysis (SEM) method. SEM analysis is reliable in performing multivariate analysis of complex models (Hair et al., 2019). Anderson and Gerbing (1988) define the matter using two steps: CFA and structural equation modeling in the first and second phases, respectively. CFA is used to identify the framework's measurement model, whereas structural equation modeling supports the offered hypotheses.

The results of confirmatory factor analysis showed good convergent and discriminant validity for all constructs (Hair et al., 2019; Bagozzi & Yi, 1988). While, the data showed normal distribution (Hair et al., 2019). The analysis of CFA results indicated a good model fit. The χ^2 value = 122.430; χ^2/(df = 78) = 1.570, (p <.001), good fit index (GFI) = .911; comparative fit index (CFI) = .961, and incremental fit index (IFI) = .962. Other indications such as the Tucker Lewis index (TLI) = .947; normed fit index (NFI) = .901, and the root mean square error of approximately (RMSEA) = .060, also indicate an acceptable model fit. The study's CFA analysis produced a good model fit with CFI, IFI, and TLI values all above .90. Meanwhile, the RMSEA and Standard RMR (SRMR) = .0465, which is above .08, also indicates good model fit.

The subsequent CFA revealed that the model fit was similarly satisfactory. Reliability of item, factor loading of standard, variance of error, construct reliability (CR), and average variance extracted (AVE) fulfilled the suggested standards (Hair et al., 2019). The analysis results demonstrated that the research model was reliable, as evidenced by CR values that exceeded .70, with exact values ranging from .750 to .851. Furthermore, the convergent validity of the study revealed appropriate values of AVE, which ranged between .501 and .657 (>.50). Table 2 shows the specifics of the aforementioned CFAs. The matrix correlation calculations were likewise approved, implying that the AVE square root diagonal computations were greater than the correlations of construct (Fornell & Larcker, 1981). Table 3 shows more information.

Table 2. Results of Confirmatory Factor Analysis Model

Construct	Factor loading	Variance of Error	Composite reliability	Average variance extracted
Transformational leadership				
TL1	.816	.334	.851	.657
TL2	.778	.395		
TL3	.836	.301		

Psychological engagement				
PE1	.703	.506	.771	.530
PE2	.722	.479		
PE3	.757	.427		
Knowledge sharing				
KS1	.774	.401	.837	.632
KS2	.756	.428		
KS3	.851	.276		
Innovative behavior				
IB1	.674	.546	.750	.501
IB2	.771	.406		
IB3	.674	.546		
Job performance				
JP1	.768	.410	.799	.571
JP2	.734	.461		
JP3	.764	.416		

Note: χ^2 = 122.430; $\chi^2/(df = 78)$ = 1.570 (p<.001); RMSEA = .060; NFI = .901; RFI = .867; IFI = .962; TLI = .947; CFI = .961; RMR = .019; GFI = .911; AGFI = .863; PGFI = .592; SRMR = .0465; and PNFI = .670.

Table 3. Discriminant Validity Correlation Matrix

Construct	TL	PE	KS	IB	JP
TL	.810				
PE	.563	.728			
KS	.201	.504	.795		
IB	.293	.582	.417	.708	
JP	.376	.715	.300	.305	.755

Note: TL, transformational leadership; PE, psychological empowerment; KS, knowledge sharing; IB, innovative behavior; JP, job performance.

Structural Model Analysis and Hypothesis Validation Results

According to Anderson and Gerbing (1988) the second approach is to validate the hypotheses proposed in this model of research. The results of the structural model analysis showed the value of Chi-Square = 133.267, Chi-square/(df = 84) = 1.587, (p <.001); RMSEA = .061; GFI = .903; NFI= .893; IFI = .957; TLI = .946; and CFI = .957, which indicated model fit. Furthermore, the IFI, TLI, and CFI values also indicated good model fit with calculations close to 1.00, and above .90. The RMSEA calculation showed a value between .04 and .08, which means model fit. While the standardised RMR (SRMR) = .0523 (less than .08) also shows acceptable model fit (Hu & Bentler, 1999).

Finally, this framework's hypothesis validation demonstrates that all hypotheses are accepted. The study results reveal that TL has a strong influence on PE (H1). Additionally, PE has an effect on KS (H2), JP (H3), and IB (H4). Table 4 shows the outcomes of hypothesis testing.

Table 4. Results of Hypothesis

Hypothesis	Relationship	Estimate	S.E.	C.R.	Conclusion
H1	TL → PE	.597***	.086	6.977	Accepted
H2	PE → KS	.811***	.115	7.030	Accepted
H3	PE → JP	.807***	.107	7.525	Accepted
H4	PE → IB	.761***	.123	6.202	Accepted

Note: *p ≤ .1; **p ≤ .05; and ***p ≤ .001
TL, transformational leadership; PE, psychological empowerment; KS, knowledge sharing; JP, job performance; IB, innovative behavior.

DISCUSSION

Transformational Leadership and Psychological Empowerment

TL has a significant effect on PE. Transformational leaders prioritize their staff. This attention from superiors is a crucial factor in increasing an employee's psychological strength. This type of leader is effective at fostering good communication with subordinates. Open communication will create a pleasant psychological environment for subordinates. This type of leader can also create intrinsic incentive to his or her followers. Intrinsic motivation is motivation that is tied to subordinate psychology rather than financial awards, bonuses, or the like. The intrinsic motivation model might take the shape of praise, gratitude, increased responsibility, trust, and others.

Several studies support the findings of this investigation. According to Avolio et al. (2004), to foster a higher sense of PE, the top management should clearly communicate a vision that encourages people at all levels of the organization to assume greater responsibility for their work. Clarity of purpose and clear definitions of duties, positions, and rewards can contribute to a sense of PE.

Pieterse et al. (2010) suggested that TL aids in enhancing subordinates' innovative behavior. However, organizations should consider the psychological empowerment of subordinates in addition to promoting TL and opposing transactional leadership. Leaders can increase subordinates' psychological empowerment through management development programs. Organizations can manage the use of TL, which is effective in fostering IB, through empowerment programs. Furthermore, studies have shown that TL can be taught, and programs of training have been designed (Pieterse et al., 2010; Barling et al., 1996). Transformational leadership development activities can supplement attempts to improve subordinates' psychological empowerment.

Furthermore, Dvir et al. (2002) discovered that TL had a good effect on subordinates' PE. This study discovered significant favorable relationships between TL and all psychological empowerment scales. This conclusion is consistent with Gumusluŏlu and Ilsev's (2009) findings. Listening, understanding, supporting, and providing confidence as a leadership style

will boost the sense of psychological empowerment (Gumusluǒlu & Ilsev, 2009). The works of Stanescu et al. (2020) and Hassan et al. (2021) also demonstrated that TL significantly increased the sense of PE.

Psychological Empowerment and Knowledge Sharing

The finding indicated that PE has a positive effect on KS. It suggests that the greater their subordinates' psychological empowerment, the greater their employees' level of information sharing. Subordinates will feel more at ease if their superiors believe in their capacity to accomplish their duties. This trust is essential for KS. A strong sense of purpose in their job will also motivate subordinates to share expertise freely

Many previous research findings are consistent with the findings of this study. Stanescu et al. (2020) investigated the impact of PE on knowledge management techniques. The findings revealed that PE has a favorable impact on KS. Additionally, Ahmadi et al. (2012) investigated the effect of PE on knowledge-sharing interest. The findings experimentally demonstrate that PE is one of the important elements influencing employees' desire in KS.

Wang et al. (2019) conducted another study. His study focuses on PE and success of project. In his study, KS serves as a moderating variable. The findings indicate that PE and KS have a considerable effect on information sharing and project success, respectively. Andam (2017) investigated the association between PE and KS. The results of a survey of 155 people reveal that two characteristics of PE, self-determination, and impact, have a direct impact on KS. Kang et al. (2017) discovered a substantial positive relationship between PE and two types of KS activities, contribution, and seeking. As a result, PE plays an important part in the knowledge-sharing process.

Andam (2017) empirically confirmed the influence of PE on IB, with KS serving as a moderating component. The study focused on MSMEs in Yogyakarta. The findings indicate that two aspects of PE, meaning, and self-determination, have a favorable effect on KS. Furthermore, Gholipour et al. (2015) found that PE and its aspects were a major predictor of employee knowledge sharing. Khan et al. (2022), Dong et al. (2022) and Khatoon et al. (2022) reached the same conclusion. All of them discovered that PE strongly predicted KS. The previous findings show that under the effect of PE, employees may proactively take on the responsibility of KS.

Psychological Empowerment and Job Performance

PE has a considerable favorable effect on JP. The feeling that subordinates' work is vital to the organization will boost their performance. An optimistic attitude of their abilities to complete their assignment has a beneficial impact on their performance. Similarly, bosses' faith in providing independence in completing their work will increase their work excitement. The performance of subordinates will improve.

Several previous study findings are consistent with the conclusions of this investigation. Helmy et al. (2019) discovered that PE has a moderating effect on individual-level behavioral outcomes like JP. With 357 respondents, Pacheco and Coello-Montecel (2023) discovered that PE improved JP. Rani et al. (2021) discovered that supporting evidence that PE can have a considerable impact on JP.

Different research findings were conducted by Chen et al. (2007) that empirical findings regarding the direct effect of psychological empowerment are varied and even controversial. Seibert et al. (2011) did not find positive relationship between competence, one of the important components of empowerment on performance. While the result of Thomas and Tymon (1994) indicated that competence has a significant effect on performance. These varied findings suggest that the relationship between these two variables could be mediated or moderated by certain variables. This will be an agenda for future research.

Psychological Empowerment and Innovative Behavior

The results demonstrated that PE has a considerable favorable effect on IB. The better subordinates' psychological empowerment, the better their innovative behavior. Superiors' delegated authority over how subordinates execute their work will result in innovative attitudes and behavior. Subordinates are allowed to be innovative in fulfilling their tasks and to generate their own ideas and then implement them in their work.

Several studies have found that PE has a considerable favorable effect. Locke and Shaw (1984) investigated the effect of individual workers' perceptions of autonomy on IB. The result indicated that perceived autonomy had a favorable effect on individual workers' innovative behavior. Helmy et al. (2019) discovered evidence that PE is favorably connected with workplace innovation.

The findings of Javed et al. (2019) revealed a link between PE and IB. It is in line with the study result of de Jong and Kemp (2003) and Singh and Sarkar (2012). Employees who are psychologically empowered will face the challenges of existing job standards and offer unique ideas (Sharifirad, 2013). Traditional work approaches are not compatible with innovative ideas. Employees that are innovative tend to go above and beyond the standard practices. As a result, in the setting of innovation, employees require PE that removes the fear of punishment or dismissal from the workplace (Javed et al., 2019).

The conclusion that PE positively affect on innovative behavior is consistent with Spreitzer's (1995) finding that PE is a predictor of IB. Employees are more likely to originate, promote, and adopt creative ideas when they believe they can affect organizational outcomes.

Furthermore, the findings of Nasir et al. (2018) complement previous findings that PE influences innovative work behavior (Ertürk, 2012). To encourage IB, a leader must distribute responsibility to their staff, convey knowledge widely to employees who need it, and provide their employees

the freedom to complete the allotted job based on their abilities and experience.

According to the findings of Seibert et al. (2011), the three elements of PE, meaningfulness, competence, and self-determination, have a favorable influence on innovative behavior. Javed et al. (2019) discovered evidence that PE is a factor that explains IB in agile teams. Furthermore, the findings of Stanescu et al. (2020); Mustafa et al. (2022); and Rafique et al. (2023) confirmed the finding that PE influenced IB considerably.

CONCLUSIONS

This study was conducted on MSME employees in Semarang, Central Java, Indonesia. There were 158 MSME employees responding. The quota sampling technique was utilized in this investigation. Food and beverage, beauty care, massage services, financial services, wholesale, and others are among the MSME business sectors studied in this study.

The study's finding suggests that TL has a positive impact on PE. Another study found that PE positively affect on KS, JP and IB. In terms of theoretical implications, the findings strengthen the association model between TL, PE, KS, JP, and IB. Practical contributions are also made in this study. The study findings can be used by organizational management to increase KS, JP and IB by enhancing employees' psychological empowerment. Moreover, TL is critical for increasing employees' psychological empowerment.

The study adds to the body of knowledge on the association between TL, PE, KS, JP, and IB. Future studies could broaden the area of independent variables influencing PE. TL serves as an independent variable in this study. As a result, the association model between the variables in this study can provide a more comprehensive picture. Future research can potentially broaden the field of industries studied to broaden generalizability. The study findings also allow future agenda to delve deeper into the effect of PE on JP, which is still highly various. This further research is necessary to take into account specific mediating or moderating variables. As a result, a thorough model of the link between the aforementioned factors will be more clearly depicted.

REFERENCES

Ahmadi, S. A. A., Daraei, M. R., Khodaie, B., & Salamzadeh, Y. (2012). Structural equations modeling of relationship between psychological empowerment and knowledge management practices (A case study: Social security organization staffs of Ardabil province, Iran). International Business Management, 6(1), 8–16.

Amichai-Hamburger, Y., McKenna, K. Y. A., & Tal, S. A. (2008). E-empowerment: Empowerment by the Internet. Computers in Human Behavior, 24(5), 1776–1789.

Andam, F. (2017). Psychological Empowerment : Exploring the Links to Knowledge Sharing. 6(1), 62–71.

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

Avolio, B. J., Zhu, W., Koh, W., & Bhatia, P. (2004). Transformational leadership and transformational learning: Information literacy and the World Wide Web. Journal of Organizational Behavior, 5(88), 951–968.

Bagozzi, R. P., & Yi, Y. (1988). On the Evaluation of Structural Equation models. Journal of the Academy of Marketing Science, 16, 74–94.

Barling, J., Weber, T., & Kelloway, K. (1996). Effects of trnasformational leadership trainning on attitudinal and financial outcomes. Journal of Applied Psychology, 81(6), 827–832.

Chen, G., Kirkman, B. L., Kanfer, R., Allen, D., & Rosen, B. (2007). A multilevel study of leadership, empowerment, and performance in teams. Journal of Applied Psychology, 92(2), 331–346.

Chiang, C. F., & Hsieh, T. S. (2012). The impacts of perceived organizational support and psychological empowerment on job performance: The mediating effects of organizational citizenship behavior. International Journal of Hospitality Management, 31(1), 180–190.

Chow, H. I., Wing-chun Lo, T., Sha, Z., & Hong, J. (2006). The impact of developmental experience, empowerment, and organizational support on catering service staff performance. International Journal of Hospitality Management, 25(3), 478–495.

Conger, J. A. (1999). Charismatic and transformational leadership in organizations: an insider's perspectice on these developing streams of research. 10(1974), 145–179.

Daft, R. L. (2021). The Leadership Experience. Cengage Learning.

De Jong, J., & Den Hartog, D. (2010). Measuring innovative work behaviour. Creativity and Innovation Management, 19(1), 23–36.

de Jong, J., & Kemp, R. (2003). Determinants of Co-Workers' Innovative Behaviour: An Investigation into Knowledge Intensive Services. International Journal of Innovation Management, 07(02), 189–212.

Dong, L., Ji, T., Zhou, G., & Zhang, J. (2022). Subjective Norms or Psychological Empowerment? Moderation Effect of Power Distance on Knowledge Sharing. Sustainability (Switzerland), 14(21).

Dvir, T., Eden, D., Avolio, B. J., & Shamir, B. (2002). Impact of Transformational Leadership on Follower Development & Performance: A Field Experiment. Academy of Management Journal, 45(4), 735–744.

Dyne, L. Van, Graham, J. W., Dienesch, R. M., Graham, J. W., & Dienesch, R. M. (2014). Dyne1994. 37(4), 765–802.

Ertürk, A. (2012). Linking psychological empowerment to innovation capability: Investigating the moderating effect of supervisory trust. International Journal of Business and Social, 3(14), 153–165.

Farzaneh, J., Farashah, A. D., & Kazemi, M. (2014). The impact of person-job fit and person-organization fit on OCB: The mediating and moderating effects of organizational commitment and psychological empowerment. Personnel Review, 43(5), 672–691.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research This, 18(1), 39–50.

Gholipour, R., Samadi Miarkolaei, H., & Samadi Miarkolaei, H. (2015). Gholipour, R., Samadi Miarkolaei, H., & Samadi Miarkolaei, H. (2015). A study on impact of psychological empowerment on knowledge sharing culture case study of female employees of ministry of education in Mazandaran province. Women's Studies Sociological and Psychological, 13(4), 181–203.

Gumusluŏlu, L., & Ilsev, A. (2009). Transformational leadership and organizational innovation: The roles of internal and external support for innovation. Journal of Product Innovation Management, 26(3), 264–277.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., Black, W. C., & Anderson, R. E. (2019). Multivariate Data Analysis (Eighth Edi). Cengage Learning.

Harris, K. J., Wheeler, A. R., & Kacmar, K. M. (2009). Leader-member exchange and empowerment: Direct and interactive effects on job satisfaction, turnover intentions, and performance. Leadership Quarterly, 20(3), 371–382.

Hassan, S., Mansoor, S., & Ali, M. (2021). Transformational leadership and employee outcomes: the mediating role of psychological empowerment. Leadership and Organization Development Journal, 42(1), 130–143.

Helmy, I., Adawiyah, W. R., & Banani, A. (2019). Linking psychological empowerment, knowledge sharing, and employees' innovative behavior in Indonesian SMEs. Journal of Behavioral Science, 14(2), 66–79.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling, 6(1), 1–55.

Javed, B., Abdullah, I., Zaffar, M. A., Haque, A. U., & Rubab, U. (2019). Inclusive leadership and innovative work behavior: The role of psychological empowerment. Journal of Management and Organization, 25(4), 554–571.

Jung, D. D., Chow, C. W., & Wu, A. (2008). Towards Understanding the Direct and Indirect Effects of Transformational Leadership on Firm Innovation. The Leadership Quarterly, 19(5), 582–594.

Jung, D. I., Sosik, J. J., & Baik, K. B. (2002). Investigating work group characteristics and performance over time: A replication and cross-cultural extension. Group Dynamics, 6(2), 153–171.

Kang, Y. J., Lee, J. Y., & Kim, H. W. (2017). A psychological empowerment approach to online knowledge sharing. Computers in Human Behavior, 74, 175–187.

Khan, J., Javed, B., Mubarak, N., Bashir, S., & Jaafar, M. (2022). Psychological Empowerment and Project Success: The Role of Knowledge Sharing. IEEE Transactions on Engineering Management, 69(6), 2997–3008.

Khatoon, A., Rehman, S. U., Islam, T., & Ashraf, Y. (2022). Knowledge sharing through empowering leadership: the roles of psychological empowerment and learning goal orientation. Global Knowledge, Memory and Communication, October.

Kmieciak, R., Michna, A., & Meczynska, A. (2012). Innovativeness, empowerment and IT capability: Evidence from SMEs. Industrial Management and Data Systems, 112(5), 707–728.

Konermann, J. (2012). Teachers' work engagement: a deeper understanding of the role of job and personal resources in relationship to work engagement, its antecedents and its outcomes [Universiteit Twente].

Li, Y., Wei, F., Ren, S., & Di, Y. (2015). Locus of control, psychological empowerment and intrinsic motivation relation to performance. Journal of Managerial Psychology, 30(4), 422–438.

Liden, R. C., Wayne, S. J., & Sparrowe, R. T. (2000). An examination of the mediating role of psychological empowerment on the relations between the job, interpersonal relationships, and work outcomes. Journal of Applied Psychology, 85(3), 407–416.

Locke, E. A., Alavi, M., & Wagner, J. A. (1997). Participation in Decision Making: An Information Exchange Perspective. Research in Personnel and Human Resources Management, 15, 293–331.

Locke, E. A., & Shaw, K. N. (1984). Atkinsons inverse-U curve & the missing cognitive variables. Psychological. Repeports, 55(2), 403–412.

Lu, Y., Foss, N., Yin, Y., Wang, Y., & Lu, Y. (2018). Human Resource Management Review Why firms adopt empowerment practices and how such practices affect firm performance. Human Resource Management Review, March 2016, 1–14.

Marane, B. M. O. (2012). The mediating role of trust in organization on the influence of psychological empowerment on innovation behavior. European Journal of Social Sciences, 33(1), 39–51.

Martins, E. C., & Terblanche, F. (2003). Building organisational culture that stimulates creativity and innovation. European Journal of Innovation Management, 6(1), 64–74.

Muhammed, S. (2006). Antecedents and impacts of knowledge management practices supported by information technology: an empirical study in manufacturing context. The University of Toledo.

Mustafa, M. J., Hughes, M., & Ramos, H. M. (2022). Middle-managers' innovative behavior: the roles of psychological empowerment and personal initiative. International Journal of Human Resource Management, 0(0), 1–27.

Nasir, Halimatussakdiah, & Suryani, I. (2018). Psychological Empowerment, Innovative Work Behavior & Job Satisfaction. Advances in Economics, Business & Management Research (AEBMR), 92(Icame 2018), 419–434.

Pacheco, P. O., & Coello-Montecel, D. (2023). Does psychological empowerment mediate the relationship between digital competencies and job performance? Computers in Human Behavior, 140, 107575.

Pieterse, A. N., van Knippenberg, D., Schippers, M., & Stam, D. (2010). Transformational and transactional leadership and innovative behavior: The moderating role of psychological empowerment. Journal of Organizational Behavior, 31(4), 609–623.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. Journal of Applied Psychology, 88(5), 879–903.

Rafique, M. A., Hou, Y., Chudhery, M. A. Z., Gull, N., & Ahmed, S. J. (2023). The dimensional linkage between public service motivation and innovative behavior in public sector institutions; the mediating role of psychological empowerment. European Journal of Innovation Management, 26(1), 207–229.

Rani, R. M., Rahman, N. R. A., & Yusak, N. A. M. (2021). The Effect of Psychological Empowerment on Employee Performance. International Journal of Innovation, Creativity and Change, 15(6), 881–899.

Seibert, S. E., Wang, G., & Courtright, S. H. (2011). Antecedents and Consequences of Psychological and Team Empowerment in Organizations: A Meta-Analytic Review. Journal of Applied Psychology, 96(5), 981–1003.

Sharifirad, M. S. (2013). Transformational leadership, innovative work behavior, and employee well-being. Global Business Perspectives, 1(3), 198–225.

Shin, S. J., & Zhou, J. (2003). Transformational Leadership, Conservation, and Creativity: Evidence From Korea. Academy of Management Journal, 46(6), 703–714.

Singh, M., & Sarkar, A. (2012). The relationship between psychological empowerment and innovative behavior: A dimensional analysis with job involvement as mediator. Journal of Personnel Psychology, 11(3), 127–137.

Spreitzer, G. M. (1995). Psychological Empowerment in the Workplace: Dimensions, Measurement, and Validation Author (s): Gretchen M . Spreitzer Source: The Academy of Management Journal, Vol. 38, No. 5 (Oct ., 1995), pp . 1442-1465 Published by: Academy of Management. Academy of Management Journal, 38(5), 1442–1465.

Srivastava, A., Bartol, K. M., & Locke, E. A. (2006). Empowering leadership in management teams: Effects on knowledge sharing, efficacy, and performance. Academy of Management Journal, 49(6), 1239–1251.

Stajkovic, A. D., & Luthans, F. (1998). Self-Efficacy and Work-Related Performance: A Meta-Analysis. Psychological Bulletin, 124(2), 240–261.

Stanescu, D. F., Zbuchea, A., & Pinzaru, F. (2020). Transformational leadership and innovative work behaviour: the mediating role of psychological empowerment. Kybernetes.

Thomas, K., & Tymon, W. (1994). Does Empowerment Always Work? Understanding the Role of Intrinsic Motivation and Personal Interpretation. Journal of Management Systems, 6, 1–13.

Vuori, V., & Okkonen, J. (2012). Knowledge sharing motivational factors of using an intra-organizational social media platform. Journal of Knowledge Management, 16(4), 592–603.

Wang, W. T., Wang, Y. S., & Chang, W. T. (2019). Investigating the effects of psychological empowerment and interpersonal conflicts on employees' knowledge sharing intentions. Journal of Knowledge Management, 23(6), 1039–1076.

THE DEVELOPMENT OF DIGITAL COMPETENCES AND ATTITUDE TOWARDS E-LEARNING

Laura Fink*
GEA College,
Slovenia
laura.fink@gea-college.si

Nataša Makovec
GEA College,
Slovenia
natasa.makovec@gea-college.si

Jaka Vadnjal
GEA College,
Slovenia
jaka.vadnjal@gea-college.si

Abstract

We have recently been witnessing a significant shift from fully classroom-based learning to blended learning. As a result, the purpose of this study is to validate the differences in digital skill levels among different groups of students (faculty and higher vocational) in Slovenia. The methods used included statistical analysis for mean differences (T-test, one-way ANOVA test), linear regression for hypothesis testing, and Chi-square for possible bias testing on a total of 223 data points. The results are based on a questionnaire that includes the following constructs: 1.) student engagement; 2.) efficient use of the e-learning platform; 3.) perception and attitude towards e-learning; 4.) digital readiness; 5.) skill development; and 6.) digital infrastructure. They indicate that digital skills differ depending on work experience, self-awareness, the study programme, and form, as well as the formal educational level attained after graduation. The study supports the idea that different groups of students differ in their digital skills and digital readiness, which proves to be relevant for their study engagement.

Key Words

Digital skills; digital competence; e-learning; motivation; study engagement.

*Corresponding Author

INTRODUCTION

The emergence of the Covid-19 pandemic brought about a number of socioeconomic challenges. Many countries implemented measures to reduce live interaction with people in order to manage this uncertain situation. This resulted in the closure of educational institutions as well as a significant shift away from traditional classroom-based teaching and learning towards an online approach. While higher education institutions have moved online and transformed their teaching and learning methods, it is unclear whether this shift will result in positive learning outcomes (Ratten, 2020).

While numerous studies have been published on the pandemic, only a few have addressed the outcomes of e-learning and e-teaching. However, the literature presents a number of learning and teaching challenges that teachers and students face. These difficulties include the inability to access or use e-learning and e-teaching tools; difficulties adjusting, particularly for students living in rural areas and from low-income families; as well as stress, depression, and anxiety (Mseleku, 2020). As a result, it is clear that Covid-19 has caused significant disruption in the educational system. However, the extent of its effects remains unknown (Bryson and Andres, 2020). Furthermore, there has been little research on the potential positive outcomes of these activities.

The study is based on the fact that digital skills are nowadays required for efficient learning. By examining whether digital skills can improve study engagement and have an impact on student achievement, it addresses the research gap that the relevant literature previously identified (Wild and Schulze Heuling, 2020). Therefore, the study addresses the differences in the levels of digital competence among different groups of students and their effect on students' engagement. These questions should be tested in various contexts. In particular, this study addresses research gaps, including on students who are employed and are more aware of their digital gap and develop their digital skills more regularly and at a faster pace. The study shows that relevant job experiences substantially contribute to the advanced digital competences that are required in an e-learning environment, while personal use of digital resources by digital natives is less relevant for learning efficiency. Moreover, we explain the characteristics of the group of students who feel more competent to master advanced digital tools.

This paper's outline is as follows: We begin with a literature review to generate hypotheses before continuing with a presentation of the sampling, methodology, and essential demographics. The research findings, which also include the provision of results and statistical calculations, follow demographics. We conclude the paper with a discussion and interpretation of the research findings, as well as some suggestions for future research.

LITERATURE REVIEW AND HYPOTHESES

We divide the literature review into four parts. The first part delves into the most recent innovative trends in educational technology and educational

models, including blended learning. The second part discusses the potential interdependence of learning achievement, engagement, and e-learning. Thirdly, study engagement and e-learning are discussed as two related items. In the fourth and final section of the literature review, we discuss the relationship between digital readiness and students' academic achievement and conclude with the three hypotheses.

Innovative educational technology and contemporary educational models

Higher education institutions have been steadily working to implement cutting-edge technologies that provide new methods of delivering and creating learning in recent years (Singh, 2021; Huda, 2022; Lockee, 2021; Deng and Tavares, 2013; Jones, 2012; Orton-Johnson, 2009). In addition to supporting communication between teachers and students, fostering student learning communities, managing student learning progress, and allowing students to enrol in online courses, an e-learning environment also aids in the distribution of study materials (Islam, 2013). Digital technology, such as a learning ecosystem known as an "e-learning environment," integrates with traditional teaching and learning methods. Technology-enabled platforms substantially contribute to educational innovation (Eze et al., 2018), as well as to new teaching and learning methods. The benefits of e-learning environments include infrastructure cost savings, contribution to learning content digitisation for easy and flexible sharing, and integration into the global educational environment (Pham et al., 2019). Technology-enhanced learning experiences have recently changed to reflect the shift in the educational paradigm from an instructor-led to a student-centred learning strategy (Ituma, 2011; Olelewe and Agomuo, 2016). Higher education institutions have created cutting-edge e-learning environments to create education that is of higher quality and student-centred (Goodyear, 2020; Islam, 2013).

E-learning in higher education uses digital technologies to create educational materials for teaching and learning, student instruction, and course editing in order to maximise student success (Fry, 2001; Parkes et al., 2015; Jošt Lešer and Berginc, 2023). With the popularity and development of multimedia and networking technologies like high-speed internet, high-definition video, smart devices, intelligent features of learning management systems, and more recently, artificial intelligence systems, e-learning has quickly developed (Cidral et al., 2018; Eze et al., 2018; Vadnjal, 2018). In universities across the world, improvements in e-learning environments have been noted (Oke and Fernandes, 2020; Castillo-Merino and Serradell-López, 2014; Naveed et al., 2017). E-learning technology tools and systems improve the quality of learning experiences and outcomes by ensuring that materials and strategies are tailored to individual students' needs and preferences (Castro, 2019; Means et al., 2013).

Blended learning (Gaebel et al., 2021) can take many forms, such as "online and offline, on-site and off-site, synchronous and asynchronous, formal and informal, vocational and recreational, and more". Hybrid or

blended learning is defined as "flexible combinations of different learning modes (e.g., in-person and online) to enhance learning experiences" (Gaebel et al., 2021). For the purpose of this study, blended learning refers to learning where a group of students attends a combination of face-to-face meetings and online synchronous and asynchronous activities. In other contexts, blended learning could refer to learning in which some students attend courses in person while others synchronously attend remotely. The most common learning models that teachers can use in blended learning include the well-known flipped model (Bredow, 2021; Pozo Sanchez et al., 2020; Tomas et al., 2019; Wilson, 2020), as well as the rotational model, the flex model, the self-blend model, the enhanced virtual model (Dakhi et al., 2020; Hrastinski, 2019; Singh et al., 2021; Bizami et al., 2022; Staker and Horn, 2012; Christensen et al., 2013), and others.

From the simple adoption of face-to-face technology-assisted instruction to the complex adoption of lecture capture, online chat, discussion boards, and social networking services, the higher education sector is adopting blended learning as the norm to improve the effects of using e-learning environments as more active approaches to promote student engagement (López-Pérez et al., 2011). Interestingly, these types of dynamic adoption of e-learning systems show mixed results for student satisfaction with the learning experience (Xiao et al., 2020; Lyons and Evans, 2013), the reduction of dropout rates (López-Pérez et al., 2011), students' academic performance (López-Pérez et al., 2011; Roffe, 2002), as well as for reflective and critical thinking (Saadé et al., 2012).

Learning achievement, engagement, and e-learning

Engagement refers to the quality of effort that students put into educationally purposeful activities and contributes to desired learning outcomes (Cook and Steinert, 2013). The deeper engagement of students can bestow on them beneficial educational practices that further lead to holistic learning (Coates, 2006; Hodge et al., 2017). Student engagement depends on commitment and learning diligence throughout the learning experience (Coates, 2006; Henrie et al., 2015) and is an important predictor of academic development (Carini et al., 2006).

Studies show that students' e-learning experiences can predict their achievement (Shanta, 2021). For example, Goh et al. (2017) argue that interaction with a teacher, particularly with peer students, is critical for learning outcomes and satisfaction. In a research experiment, Kiviniemi (2014) found that blended approaches to learning, which include both face-to-face and e-learning components of the course, improved student performance more than the traditional approach.

Study engagement and e-learning

Study engagement is essential in any learning environment, including face-to-face, online, and blended courses (Henrie et al., 2015). Coates (2006) demonstrates, based on a more inclusive and holistic view of the student

experience, that student engagement emerges from a dynamic relationship between students and their institutional context where student engagement is more focused on students' experiences in both internal and formal structural settings. Digital learning experiences can improve learning quality by complementing and facilitating interactions with the instructor or other students, as well as providing easy access to support, tools, and additional content (Abbad et al., 2009).

However, when discussing findings – including how an e-learning environment enables students to be more engaged and perform better in their studies (Islam, 2013), and technology can connect students, teachers, and course content (Mehdinezhad, 2011) - there is a strong need to consider the context of the study. Prior to the pandemic, online teaching and learning were merely supplements to traditional ones in blended settings. On the other hand, in some fully online courses today, students have no synchronous meetings with the teachers at all. It is widely accepted that synchronous communication and in-person communication increase engagement. Lee et al. (2019) created a measurement instrument for student engagement in an e-learning context where "psychological motivation, peer collaboration, cognitive problem solving, interactions with instructors, community support, and learning management" all contribute to student engagement.

According to the literature, complete e-learning programmes generally result in lower completion rates and engagement (Lee et al., 2019; Bates, 2019), whereas e-learning is thought to be especially beneficial in blended settings or as a supplement to traditional learning environments. E-learning, for example, is important in higher education institutions for enhancing the educational experience by providing materials and activities and thus supporting traditional methods of teaching and learning in the classroom. Students benefit from the introduction of e-learning in a variety of ways, including the flexibility of time and place of learning, the efficiency of access to knowledge and information, interactivity, differentiation, and self-design (Arkorful and Abaidoo, 2015). Furthermore, various online activities such as reading, writing, watching video tutorials, online self-assessments, and online meetings affect students' engagement in different ways (Dewan et al., 2019).

Digital readiness and student's academic achievement

Digital readiness refers to students' technological knowledge, skills, attitudes, and competences in using digital technologies to meet educational goals and expectations in higher education (Hong and Kim, 2018). The digital competence framework (Carretero et al., 2017) includes five competence areas (information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving) and examples of how digital competences are used in learning and employment. Furthermore, previous research findings (Kim et al., 2018) support the notion that students' digital readiness is important for academic achievement and

that it affects both students' academic achievement and student engagement.

Although Martzoukou et al. (2020) and Findeisen and Wild (2022) supported the finding that the frequency of chosen digital activities in everyday life affects digital competence profiles, Margaryan et al. (2011) discovered a significant gap between students' digital skills proficiency in informal contexts and formal learning. Students' digital readiness encompasses the meaningful use of digital skills for academic work, the development of digital skills through active participation and critical evaluation, and the application of digital skills and strategies to academic work. This can be one of the most important links between a student's e-learning experience and academic achievement.

Several studies (Findeisen and Wild, 2022; Lucas et al., 2022) have built their research upon the Digital Competence Framework, which recognises the importance of digital competence in higher education and vocational schools (Carretero et al., 2017). Others (Caena and Redecker, 2019; Nunez-Canal et al., 2022) investigate teachers' digital competences using the Educators' Digital Competence (EDC) framework.

Since digital competence facilitates better student achievement and is now required for students to be able to follow the learning process, it is critical to recognise individual differences among students' digital competence levels and different sets of digital skills, or digital skill profiles. According to the literature, different groups of students have varying levels of digital competence. A study by Wild and Schulze Heuling (2020), for example, supports the notion that students who enter vocational schools have lower levels of digital competence than students who enter higher education institutions.

Findeisen and Wild (2022), on the other hand, argue that divergences can be explained by differences in school-leaving qualifications prior to enrolment in tertiary educational programmes. Not only that, but Delcker (2022) supports the idea that the level varies between different types of vocational schools. Similarly, Krelova et al. (2021) support the findings from Wild and Schulze Heuling (2020) that digital competences differ by study programme specialisation, study level, and study form.

Our aim is to validate the differences in digital skill levels among separate groups of students in Slovenia. Firstly, between faculty students and higher vocational students, and secondly, between part-time students and full-time students. Therefore, hypotheses 1 and 2 suggest the following:

H1. Variation between digital skills and digital readiness is evident for different groups of students.

H2. Part-time students base their study engagement on a different level of digital competence than full-time students.

Since previous research (Kim et al., 2018) has found that digital competences are nowadays essential and required for students'

engagement and academic achievement, we strive to support this assumption in our setting and propose hypothesis 3:

H3. Digital competences and digital readiness have a positive effect on study engagement.

METHODOLOGY, SAMPLING, AND DEMOGRAPHICS

The measurement instrument on which this study is based is made up of six constructs: 1.) student engagement; 2.) effective use of the e-learning platform; 3.) e-learning perception and attitude; 4.) digital readiness; 5.) skill development; and 6.) digital infrastructure.

Student engagement is measured using a scale developed by Handelsman, Briggs, Sullivan, and Towler (2005). Study engagement is defined as the psychological and behavioural effort and investment a student makes in learning, understanding, or mastering the skills and knowledge involved in study work (Fredricks, Blumenfeld, and Paris, 2004). Students' interactions with e-learning systems can influence their study engagement.

Three criteria adapted from Chu and Chen (2016) serve as indicators of the e-learning platform's effectiveness. Higher education students' self-assessment of their personal capabilities and resources is also a precursor to the acceptance of e-learning components. Perceived behavioural control is known to be a positive predictor of intention to adopt e-learning (Chu and Chen, 2016).

Students' positive or negative perceptions and attitudes toward e-learning are measured by the four items adapted from Chu and Chen (2016). In addition, to measure the extent to which e-learning contributes to digital competences, the authors added yet another item: "I believe that I will improve my digital business competences through e-learning."

The items used to assess digital readiness were adapted from Hong and Kim (2018), who assessed students' perceived digital competences for academic engagement. Three additional items within the digital readiness construct were adapted from the measurement instruments about the use of digital skills in Slovenia (ACS, 2020; Zupan, 2016; DESI, 2022). By doing so, we want to demonstrate that digital readiness is critical for students' academic success.

Finally, three items on students' self-reported skill development and three items on the assessment of the surrounding national digital infrastructure are included in the measurement instrument. The former items reflect student awareness of their own skills gap, the frequency with which they develop their skills, and their awareness of the opportunities to use data-driven technologies, where the latter items reflect students' trust in the national digital infrastructure, in national digital education, and in teachers' digital qualifications. These items were adapted from measurement instruments for the use of digital skills in Slovenia (ACS, 2020; Zupan, 2016; DESI, 2022).

Students had access to the questionnaire via the online surveying tool from November 2021, the second month of the study year, until the end of

the study semester in January 2022. Due to the ongoing Covid-19 pandemic, many study activities were delivered in part or entirely through e-learning platforms. As a result, the link to the online survey was made available in different courses' virtual classrooms, and teachers were asked to encourage students to participate in the study. In total, 223 questionnaires were completed.

We analysed two different samples. Higher vocational study programmes last two years, during which time students earn 120 ECTS and gain more practical skills and competences. All students are enrolled as part-time students. Since 2014, the higher vocational school has used e-learning and e-teaching. Students are well aware of what to expect from online learning programmes. The second sample consists of faculty students. The faculty offers study programmes on two (Bologna) levels: bachelor's (1st level, 180 ECTS, full-time and part-time three-year programmes) and master's (2nd level, 120 ECTS, the part-time programme). The proportion of master level programme respondents in the total sample is so small that no interpretation of the results is provided for this specific group of students.

The faculty first introduced online programmes in the study year 2020-2021. The faculty and the vocational school are both institutions operating at tertiary level in education (higher education). Both institutions are not directly vertically coherent or aligned (Coherent Curriculum, Edglossary, n. d.). Students at the higher vocational school reach the 6th level of education after graduation, while graduates of the faculty reach the 7th level of education according to SOK (Slovenian qualification framework, n.d.), and the 5th and 6th levels of education according to EOK (European qualification framework, n.d.). Students must have completed secondary school in order to enrol in either the faculty or the higher vocational school. In terms of age, full-time faculty students are the youngest of the three groups of students, followed by part-time faculty students. Part-time students at the higher vocational school are the oldest of the three groups on average.

RESULTS

In this section, we first present the sampling method and testing, following which, we examine the questionnaire's internal consistency before the survey results are presented. Cronbach's alpha is used to check the consistency of the questionnaire. Statistical analysis for mean differences (T-test, one-way ANOVA test), linear regression for hypothesis testing, and Chi-square for possible bias testing are also employed.

Sample representativeness

The sample (N = 223) includes 32% of the entire population of the studied organisation. The results of the chi-square test (less than $P = 0.00$) show that the observed sample is not representative of the entire population. The reasons for that lie not only in the size of the sample, but also in the coverage, or representativeness, of certain categories of the population. The

sample should include more than 87 % of the population and declare an approximate similar distribution of chosen categories (e.g., age, programmes, other characteristics) as the population for the sample to be considered representative. The age structure of the sample is shown in Table 1.

Table 1: Sample and population: age structure

	Born in 2002 and 2001	Born from 2000 to 1996	Born from 1995 to 1990	Born from 1989 to 1981	Born in 1980 or later	Total
Survey	60	89	24	40	8	221*
	27%	40%	11%	18%	4%	100%
Enrolled	130	360	87	72	57	706**
	18%	51%	12%	10%	8%	100%

* Two students did not declare their year of birth. The total sample contains 223 responses.

The population includes graduates. The structure of the sample according to the type of higher education institution is shown in Table 2.

Table 2: Sample and population: type of higher educational institution

	Faculty of Entrepreneurship (FE)	Higher Vocational School (VS)	Graduates at FE or VS	Total
Survey	136	85	2 (both FE)	223
Enrolled	352	290	64	706

Reliability / Internal consistency of a questionnaire

The measurement instrument includes 25 items and six constructs. Items were measured on a five-point Likert scale from 1 to 5, where (1) means "totally disagree" and (5) means "totally agree." The examination of the internal consistency of the five constructs and the entire measurement instrument has shown that the two constructs ("efficient use of the e-learning platform" and "digital readiness") are highly consistent ($0.80 < \alpha < 0.90$). The constructs "student's engagement in studying" and "skill development" are just consistent ($\alpha > 0.60$). Although the construct "digital infrastructure" is close to being internally consistent, measured by a reference value of Cronbach's, it has been shown that items of two joint constructs, "skill development" and "digital infrastructure", when considered together, reached an internal consistency of 0.71.

On the other hand, the value of Cronbach's alpha for the construct "perception and attitude towards e-learning" ($\alpha = 0.92$) suggests that the omission of some items could be reconsidered in a possible replication of this study. Similarly, the internal consistency of the entire measurement instrument suggests small differences between the five constructs measured. Namely, our calculations suggest that Cronbach's alpha, which measures the internal consistency of the questionnaire, is 0.9, which is higher than the anticipated marginal value of 0.7 (Hair et al., 2006) and supports the adequacy of the questionnaire. The values of Cronbach's alpha for all of the constructs are displayed in Table 3.

Table 3: Number of items and results of Cronbach's alpha

	Number of items	Cronbach's alpha
Student's engagement in studying	4	0.63
Efficient use of the e-learning platform	3	0.87
Perception and attitude towards e-learning	5	0.92
Digital readiness	7	0.80
Skill development	3	0.61
Digital infrastructure	3	0.53
All items	**25**	**0.90**

Survey results and hypothesis testing: the differences between two samples

In Tables 4 and 5, the survey results are collected. In both tables, mean values for the different samples are given, and the p-value between the two groups is calculated with a t-test (heteroscedasticity and unequal variances were assumed). Table 4 provides the significant differences between the full-time (faculty only) and part-time students (both from the higher vocational school and the faculty).

Table 4: Mean values and significant differences between the full-time and part-time students (self-reported measurement)

Full-time students (faculty) (N=78) Part-time students (faculty and vocational school) (N=145)	Av. Full.	Av. Part.	P- value	Sig.
Student's engagement in studying (Handelsman, Briggs, Sullivan, and Towler, 2005)				
I will make sure to study regularly.	4.21	4.49	0.0015	***

I will find ways to make the course interesting to me.	4.19	4.38	0.0375	**
I desire to learn the material.	4.64	4.68	0.6321	
I will have fun in class.	4.64	4.59	0.5728	
Efficient use of e-learning platform (Chu and Chen, 2016)				
I have the knowledge necessary to use the digital learning system.	4.22	4.30	0.4917	
I have control over the digital learning system.	3.92	3.96	0.7796	
I have the resources necessary to use the digital learning system.	4.14	4.23	0.4183	
Perception and attitude towards e-learning (Chu and Chen, 2016)				
I feel positive about digital learning.	3.72	4.37	0.0000	***
Studying via digital learning is a good idea.	3.74	4.37	0.0000	***
Studying via digital learning is a wise idea.	3.73	4.34	0.0000	***
All things considered, using the digital learning system is beneficial to me.	3.83	4.32	0.0005	***
I believe that I will improve my digital business competences through e-learning. (*)	3.88	4.12	0.0748	*
Digital readiness (first four items adapted from Hong and Kim, 2018; items five to seven adapted from ACS, 2020; Zupan, 2016; DESI, 2022)				
I can generate keywords to search for information for academic work.	3.97	4.29	0.0060	***
I can interact with classmates using real-time communication tools (e.g., video conferencing tools or messengers).	4.32	4.43	0.3088	
I can share my files with classmates using online software.	4.13	4.25	0.3367	
I can collaborate with classmates using online software.	4.21	4.23	0.7890	
I have mastered at least one online survey tool.	4.12	3.77	0.0098	***
I understand how to use social networks (e.g., FB, Instagram, and LinkedIn) for business purposes.	4.19	4.29	0.4109	
I know how to use web design tools and create a simple website or blog (e.g., WordPress).	3.23	3.12	0.5429	
Skill development (adapted from ACS, 2020; Zupan, 2016; DESI, 2022)				
I regularly improve my digital skills.	3.74	4.03	0.0231	**
I am aware of the shortcomings in my digital technology skills, and I am trying to diminish them.	4.01	4.16	0.2016	

I am well acquainted with and understand the opportunities of data-intensive technologies (e.g., artificial intelligence, analytics, big data, etc.).	3.42	3.61	0.1354	
Digital infrastructure (adapted from ACS, 2020; Zupan, 2016; DESI, 2022)				
I know that some services are available to me as a citizen online (e.g., e-government, e-taxes, e-banking, e-health).	4.17	4.59	0.0001	***
In Slovenia, we have a good digital infrastructure, the possibility of connecting to the Internet, and modern equipment.	3.82	3.99	0.1592	
In Slovenia, we have digitally qualified teachers and developed digital learning platforms.	3.58	3.72	0.2630	

*p<0.1
** p<0.05
***p<0.001

As seen from Table 4, we first examine students' engagement and studying. Results show that part-time students are more engaged and ready to put in much more effort to make their studies interesting. Regarding students' perception of e-learning, the results reveal a significant difference between the two groups. The attitude towards e-learning is significantly higher among part-time students (according to all of the variables).

Results show that the full-time faculty students feel more competent in using advanced online tools compared to the part-time students (of the faculty and the higher vocational school). This finding suggests that younger generations should not be simply regarded as being more digitally skilled, but that the specific target group, as well as the purpose and the specific type of digital skill, should be considered.

Moreover, a higher level of competence regarding the use of digital tools among part-time students may be explained precisely by their work experience. Usually, on-the-job needs and requirements, accompanied by the frequent use of digital tools, contribute to higher competence and increased efficiency. Looking at the assessment of skill development and digital infrastructure, it appears that part-time students are more interested in improving their computer skills and are more aware of the availability of different digital tools, which can be, again, probably best explained by their professional position, tenure, as well as professional experiences and their employers' expectations.

Table 5: Mean values and significant differences between full-time faculty students, part-time faculty students, and part-time higher vocational students

Higher Vocational School (N=85) Full-time (faculty) (N=78) Part-time (Faculty)(N=60) Statement	High. Voc.		Full-time		Part-time f.		P-value	Sig.
	Av.	R	Av.	R	Av.	R		
Student's engagement in studying (Handelsman et al., 2005)								
I will make sure to study regularly.	4.59	1	4.21	3	4.35	2	0.0004	***
I will find ways to make the course interesting to me.	4.44	1	4.19	3	4.30	2	0.0467	**
I desire to learn the material.	4.71	1	4.64	2	4.63	3	0.6615	
I will have fun in class.	4.66	1	4.64	2	4.50	3	0.2540	
Efficient use of e-learning platform (Chu and Chen, 2016)								
I have the knowledge necessary to use the digital learning system.	4.36	1	4.22	2	4.20	3	0.3673	
I have control over the digital learning system.	4.00	1	3.92	2	3.90	3	0.7555	
I have the resources necessary to use the digital learning system.	4.19	2	4.14	3	4.30	1	0.4986	
Perception and attitude towards e-learning (Chu and Chen, 2016)								
I feel positive about digital learning.	4.48	1	3.72	3	4.20	2	0.0000	***
Studying via digital learning is a good idea.	4.51	1	3.74	3	4.17	2	0.0000	***
Studying via digital learning is a wise idea.	4.46	1	3.73	3	4.17	2	0.0000	***
All things considered, using the digital learning system is beneficial to me.	4.46	1	3.83	3	4.13	2	0.0001	***
I believe that I will improve my digital business competences through e-learning.	4.35	1	3.88	2	3.80	3	0.0013	***
Digital readiness (first four items adapted from Hong and Kim, 2018; items five to seven adapted from ACS, 2020; Zupan, 2016; DESI, 2022)								
I can generate keywords to search for information for academic work.	4.29	1	3.97	3	4.28	2	0.0141	**
I can interact with classmates using real-time communication tools (e.g., video conferencing tools or messengers).	4.45	1	4.32	3	4.42	2	0.5276	
I can share my files with classmates using online software.	4.14	2	4.13	3	4.40	1	0.1244	
I can collaborate with classmates using online software.	4.15	3	4.21	2	4.35	1	0.2866	
I have mastered at least one online survey tool.	3.73	3	4.12	1	3.82	2	0.0421	**
I understand how to use social networks (e.g., FB, Instagram, LinkedIn) for business purposes.	4.19	3	4.19	2	4.43	1	0.1325	
I know how to use web design tools and create a simple website or blog (e.g., WordPress).	2.86	3	3.23	2	3.50	1	0.0094	***
Skill development (adapted from ACS, 2020; Zupan, 2016; DESI, 2022)								
I regularly improve my digital skills.	4.01	2	3.74	3	4.07	1	0.0598	*
I am aware of the shortcomings in my digital technology skills, and I am trying to diminish them.	4.15	2	4.01	3	4.17	1	0.3962	
I am well acquainted with and understand the opportunities of data-intensive technologies (e.g., artificial intelligence, analytics, big data, etc.)	3.42	2	3.42	3	3.88	1	0.0059	***
Digital infrastructure (adapted from ACS, 2020; Zupan, 2016; DESI, 2022)								
I know that some services are available to me as a citizen online (e.g., e-government, e-taxes, e-banking, e-health).	4.59	1	4.17	3	4.58	2	0.0001	***
In Slovenia, we have a good digital infrastructure, the possibility of connecting to the Internet, and modern equipment.	4.00	1	3.82	3	3.98	2	0.3722	
In Slovenia, we have digitally qualified teachers and developed digital learning platforms.	3.72	1	3.58	3	3.72	2	0.5138	

Note: Av. Stands for average, R for rank, Sig. for significance, and P-value stands for P-value between the three groups (One-way ANOVA), Higher vocational school students are all part-time students.

* p<0.1
** p<0.05
***p<0.001

As seen from Table 5, students' engagement in studying is analysed. The results show significant differences between the three groups of students. Students at the higher vocational school (all part-time) are the most engaged in their studies, followed by the part-time faculty students, whereas full-time students are the least engaged in their studies. The results suggest that external factors such as employment in general, but more specifically professional status, their professional situation, the possibility of an increase in salary and promotion due to higher education level, and awareness of the lack of one's own digital skills and the need to make up for the gap in those digital skills to successfully master work tasks, could trigger students' internal motivation. Moreover, students in higher-level vocational schools are the most motivated in their studies, because they want to compensate for their skills gap, which they are aware of.

Namely, looking at the measurements of digital readiness, the part-time students at the higher vocational school feel more competent to master simple digital tools (an e-learning platform). On the other hand, part-time faculty students feel more competent to master advanced digital tools (collaboration tools, online survey tools, social networking tools, web design tools), as well as to improve their digital skills at a faster pace and on a more regular basis. This can be explained by the fact that these students are likely to use digital tools in their work on a regular basis. As far as the assessment of skill development is concerned, full-time students are least likely to regularly improve their computer skills, which again highlights that they might not be aware of their digital skills gap. This is further emphasised by their assessment of the digital infrastructure, which also shows that they are the least aware of digital services and data-driven opportunities. This may be because the general acknowledgement of the younger generation's digital readiness is either denied or likely limited to social media and chatting apps rather than the more task- and learning-oriented implications of digitalisation opportunities. Regarding the self-reported assessment of the efficient use of the e-learning platform, there were no significant differences revealed.

Digital readiness and students' engagement in e-learning

Linear regression is performed on the following constructs (following the variables from Tables 4 and 5). The values of the constructs as independent variables of the regression model were calculated using the summed scales method. The following constructs were used: (Y) student's engagement in studying (dependent variable); (X1) efficient use of an e-learning platform; (X2) perception and attitude towards e-learning; (X3) digital readiness; (X4) skill development; and (X5) digital infrastructure. The steps and results of the regression analysis are displayed in Table 6.

Table 6: Regression analysis

Regression Statistics	
Multiple R	0.5091
R Square	0.2592
Adjusted R Square	0.2456
Standard Error	0.3619
Observations	223

ANOVA					
	df	SS	MS	F	Significance F
Regression	4	9.9952	2.4988	19.0732	0.0000
Residual	218	28.5603	0.1310		
Total	222	38.5555			

	Coefficients	Standard Error	t-value	p-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2.8383	0.1937	14.655	0.0000	2.4566	3.2200	2.4566	3.2200
X1	0.0710	0.0397	1.7877	0.0752	-0.0073	0.1493	-0.0073	0.1493
X2	0.0861	0.0331	2.6050	0.0098	0.0210	0.1512	0.0210	0.1512
X4	0.1020	0.0460	2.2187	0.0275	0.0114	0.1926	0.0114	0.1926
X5	0.1528	0.0515	2.9673	0.0033	0.0513	0.2543	0.0513	0.2543

Thus, the regression model provided in equation (1) shows that study engagement is primarily determined by the efficient use of the e-learning platform (X1) and positive perception and attitude (X2) towards e-learning challenges and opportunities, as well as self-reported skill development (X4) and digital infrastructure assessment (X5).

(1)

$$Student's\ Engagement$$
$$= 2.84 + \ 0.07 * Efficient\ use\ of\ OL\ platform$$
$$+ 0.09 * Peception\ and\ attitude\ to\ OL + \ 0.10$$
$$* Skill\ development + 0.15$$
$$* Digital\ infrastructure$$

When we looked at the individual items of the significant constructs, we found that none of the three items of the (X1) efficient use of the e-learning

platform has a significant positive linear relationship with the construct, but the mean construct does. Out of the five items of the construct (X2), perception and attitude, the item "I believe I will improve my digital business competences through e-learning" exhibits a significant positive linear relationship when examined independently, where "studying with digital learning is a good idea" is close to being significant. Out of the three statements for the X4 skill development construct, only the statement "I regularly improve my digital skills" seems to show a significant positive linear relationship when examined independently, whereas for (X5), an awareness of the availability of e-services for citizens, trust in digitally qualified teachers, and developing digital learning platforms show a significant positive linear relationship with engagement.

The construct of (X3), digital readiness, with its seven items, does not exhibit a significant linear relationship with (Y), student's engagement. However, when examining the individual items of this construct, we found out that the lowest level of digital skills, such as the ability to "create keywords to find relevant information needed for study activities," does exhibit a positive and significant linear relationship with students' engagement. Besides, the skills "how to collaborate with classmates using online software" and "how to share files with classmates using online software" also represent a lower level of digital skills, and digital literacy skills are close to being significant.

ANALYSIS

Based on the quantitative analysis, we can support hypothesis H1, which assumes that there is a variation in digital skills and digital readiness for different groups of students. Furthermore, hypothesis H2, which states that part-time students base their study engagement on a different level of digital competence than full-time students, is also supported. Hypothesis H3, which assumes that digital competence and digital readiness have a positive impact on study engagement, is only partially supported. More extensive interpretations of the results are provided below.

Student engagement in studying

Part-time students are more involved in their studies than full-time students. The possible explanations for this result include the fact that external motivators (such as job promotion, salary increase, improved professional situation and status, and awareness of a lack of skills to master complex digital tools) could trigger internal motivators in the group of higher vocational students who are eager to close the skills gap. Full-time students, on the other hand, who are on average, younger digital natives with no prior work experience, do not appear to recognise or be aware of the types of digital skills required in professional work situations. For this reason, they are less critical of their own level of digital skill mastery and appear to be more confident in mastering complex digital tools, according to self-perceived

measurement. As a result, the differences in actual levels of digital skills may be lower than reported. Nonetheless, differences exist and may be explained by employment status, tenure, age, type of study programme, the achieved level of education after graduation, as well as differences in their anticipated salary increase and general professional situation following graduation. With this, we address the research gap identified by Wild and Schulze Heuling (2020), who suggest that further research into the relationship between digital literacy and engagement, as well as the relationship between digital literacy and learning outcomes, is needed.

Efficient use of the e-learning platform

There are no differences in the self-reported level of the necessary skills to use the e-learning platform efficiently. One interpretation is that e-learning was our reality during Covid times, and students have since acquired the necessary skills to effectively use the learning platforms.

Perception and attitude towards e-learning

Part-time students at the higher vocational school have a far more positive attitude towards e-learning than part-time and full-time faculty students. Part-time students may have a more positive attitude towards e-learning due to the need for greater flexibility in learning hours and more developed independent learning competences. It is very likely that higher vocational school students who chose to enrol in the fully online programme in the first place are more supportive of e-learning than part-time faculty students who attend programmes that are either blended (in person and online) or fully online. Besides, students in higher vocational schools, which have a longer history of e-learning, receive introductory training to prepare them for e-learning. As a result, these students are better at developing their own expectations when they enrol.

Digital readiness and skill development

Part-time faculty students believe they are more capable of mastering advanced digital tools (collaboration tools, online survey tools, social networks, and web page design tools) than part-time vocational students. The fact that students from the higher vocational school are, on average, older, have longer tenure, and have richer work experiences than the younger part-time faculty students may help to explain the differences in skill levels. As a result, they may be far more critical of their own digital skill level. Professional experience has obviously contributed to their awareness of the digital skills gap.

The results also show that part-time faculty students and higher vocational school students improve their digital skills at a faster and more consistent rate than full-time faculty students, presumably due to the job-related application of competences. As previously stated, work experience obviously contributes to the awareness of deficiencies in digital skills, which

is required for closing the skills gap. Professional experience and age appear to contribute to more developed independent learning competences.

Furthermore, this implies that we are, in fact, investigating various target groups. In addition to Wild and Schulze Heuling (2020), who previously supported the idea that different study programmes and entrance qualifications attract different target groups, we show that there is a difference in the level of digital skills regardless of the entrance qualifications. However, it should be noted that, while the entrance requirements are the same, there is a difference in the type of programme, because students at the higher vocational school receive a lower formal level of education after graduation than faculty students. These students, presumably, will have different professional prospects and aspirations after they graduate and enter the labour force.

Assessment of digital infrastructure

Part-time faculty and higher vocational school students are much more aware of the various e-tools available to citizens, such as e-government, e-taxes, e-banking, and e-health, than full-time faculty students. Since the relationship between digital infrastructure assessment and engagement is positive, we can claim that trust in the quality of digital infrastructure and trust in the teacher's qualifications enhance students' study engagement.

DISCUSSION

In the discussion, we have provided some additional ideas for interpreting the findings of the various groups observed in this study. First, we outline the differences between full-time and part-time faculty students, before continuing with a comparison of the two groups: the faculty and the higher vocational school part-time students. We conclude by comparing all three groups: faculty full-time students, faculty part-time students, and higher vocational part-time students. Finally, we discuss some future research prospects and the implications of the study.

The full-time faculty students compared to the part-time faculty students

Part-time students are more engaged and do more to make their studies interesting than full-time students. It is more important for full-time students that studying is also enjoyable. Both groups have roughly the same level of proficiency in using the e-learning platform. Part-time students self-reported significantly more positive perceptions and attitudes towards e-learning (according to all criteria, except the belief that "e-learning helps them to improve their digital competences" which is similar for both groups; mean value 3.8), implying that part-time students value the benefits of e-learning much more. Part-time students self-reported a higher level of digital readiness than full-time students in general, apart from when using survey

tools, where full-time students performed better. Part-time students, in particular, are significantly better at creating the keywords needed to find relevant information for their studies. Furthermore, part-time students have a higher self-assessment of their skill development, are more aware of their skills gaps, and appear to improve their digital skills more frequently than full-time students. Furthermore, these students are significantly more aware of the various digital tools available.

The part-time students at the faculty compared to the part-time students at the higher vocational school

In terms of student engagement, part-time students at the vocational school are more engaged in their studies than part-time students at the faculty, according to all criteria. Part-time students at the higher vocational school also self-report a slightly more developed ability to use the e-learning platform competently. Furthermore, part-time students from the higher vocational school self-reported significantly more positive perceptions and attitudes towards e-learning across all criteria, implying that they value the benefits of e-learning far more than their part-time counterparts from the faculty. There is a significant difference in their beliefs that they can improve their digital competences through e-learning (mean values 4.35 and 3.80, respectively). In terms of digital readiness, there is a close similarity to basic digital skills such as keyword usage and mastery of basic digital communication tools. Part-time faculty students, on the other hand, believe they are better prepared to master a variety of complex digital tools (survey tools, collaboration tools, social networks, and creating a simple website). These students' assessments of their own skill development are very similar. However, part-time students at the higher vocational school (mean values 3.42 and 3.88) appear to be more aware of the importance of data-intensive technologies.

The higher vocational students compared to the part-time faculty students and the full-time faculty students

Students at the higher vocational school are the most engaged in their studies, followed by part-time and full-time faculty students. They also have a more positive perception of the benefits and outcomes of e-learning. They believe they are more capable of mastering simple digital tools (e-learning platforms) than advanced digital tools (collaboration tools, online survey tools, social networks, and web page design tools). Part-time faculty students feel more competent to master advanced online tools than full-time students and students from the higher vocational school and improve their digital skills at a faster and more regular rate. Full-time faculty students are less interested and engaged than part-time students, particularly students from the higher vocational school. They have a lower likelihood of improving their digital skills and are less likely to have a positive attitude and perceive the benefits of e-learning in general.

Limitations

The reliance on self-reported measures and the non-representative sample are two significant limitations of this study.

IMPLICATIONS AND FURTHER RESEARCH

This study supports the idea that there is variation in digital skills and digital readiness for different groups of students and that part-time students base their study engagement on a different level of digital competence than full-time students. Additionally, it also partially supports the positive impact of digital competences and digital readiness on study engagement. The findings of this study suggest that digital skills differ depending on the study programme and form, which has previously been supported in different settings by Wild and Schulze Heuling (2020) and Krelova et al. (2021). However, we believe that differences in digital skill levels exist in our setting, regardless of entry requirements. Furthermore, we believe that engagement is inextricably linked to the level of digital skills as well as the study programme and the various student target groups. Based on the findings, it appears that student engagement is related to their employment status. More research in different settings to back up this finding would be useful. The finding by Dewan et al. (2019) that various types of e-learning activities have various effects on student engagement should be further developed in future research on engagement. Furthermore, it is important to investigate the relationships between the variables using alternative techniques, such as logistic regression, where the dependent variable would comprise both full-time and part-time students as well as students attending higher vocational schools and faculty. It would be reasonable to look for other types of relationships, such as the curvilinear or u-shaped relationship between the constructs, given that the hypothesis that digital readiness has a positive impact on study engagement is only partially supported.

In addition, we argue in this existing study that younger digital natives with no prior work experience do not recognise or are unaware of the type of digital skills required in professional work situations. As a result, this aspect should be investigated further to determine whether the younger generation of digital natives is not only less aware of their skills gap, but also less critical of their level of mastery of digital skills and thus appears more confident to master complex digital tools based on self-perceived measurement. Could future research back up our claim that greater awareness of one's own digital skills gap leads to a faster and further development of skills on a more regular basis, as well as increased engagement in skill development?

We believe that rather than simply considering younger generations to be more naturally digitally skilled, the specific target group, as well as the purpose and type of digital skills, should be considered. As a result, specific profiles of digital competence must be measured in the future to show which specific types of digital skills younger generations and students without prior

work experience master better than older and employed students, and vice versa.

In practice, our findings could be used to plan future study programmes and learning activities, especially when it comes to deciding when and how to include digital skills in the curriculum.

REFERENCES

Blanchflower, D. G., Oswald, A. J. (2004). Well-being over time in Britain and the USA. Journal of Public Economics. Journal of Public Economics, 88(7–8), 1359–1386.

Blanchflower, D. G., Oswald, A. J. (2005). Happiness and the Human Deve-lopment Index: The Paradox of Australia. The Australian Economic Review, 38(3), 307–318.

Cantril, H. (1965). The pattern of human concerns. New Brunswick: Rutgers University Press.

Abbad, M. M., Morris, D., & de Nahlik, C. (2009). Looking under the bonnet: Factors affecting student adoption of e-learning systems in Jordan. International Review of Research in Open and Distance Learning, 10(2), 1–25. https://doi.org/10.19173/irrodl.v10i2.596

ACS (2020). E-vprašalnik za vrednotenje digitalne kompetence. https://arhiv.acs.si/rezultati_projektov/SPISDVNPZ_2016-2022/E-vprasalnik_za_vrednotenje_digitalne_kompetence.pdf

Arkorful, V., & Abaidoo, N. (2015). The role of e-learning, advantages, and disadvantages of its adoption in higher education. International Journal of Instructional Technology and Distance Learning, 12(1), 29–42.

Bates, T. (2019). Teaching in a digital age. Tony Bates Associates Ltd.

Bizami, N. A., Tasir, Z., & Kew, S. N. (2022). Innovative pedagogical principles and technological tools capabilities for immersive blended learning: a systematic literature review. Education and Information Technologies, 1–53. https://link.springer.com/article/10.1007/s10639-022-11243-w

Bredow, C. A., Roehling, P. V., Knorp, A. J., & Sweet, A. M. (2021). To flip or not to flip? A meta-analysis of the efficacy of flipped learning in higher education. Review of Educational Research, 91(6), 878–918.

Bryson, J. R., & Andres, L. (2020). Covid-19 and rapid adoption and improvisation of online teaching: curating resources for extensive versus intensive e-learning experiences. Journal of Geography in Higher Education, 44(4), 608–623.

Caena, F., & Redecker, C. (2019). Aligning teacher competence frameworks to 21st-century challenges: The case for the European Digital Competence Framework for Educators (Digcompedu). European Journal of Education, 54(3), 356–369.

Carini, R. M., Kuh, G. D., & Klein, S. P. (2006). Student engagement and student learning: Testing the linkages. Research in higher education, 47(1), 1–32.

Carretero, S., Vuorikari, R., & Punie, Y. (2017). The digital competence framework for citizens. Publications Office of the European Union.

Castillo-Merino, D., & Serradell-López, E. (2014). An analysis of the determinants of students' performance in e-learning. Computers in Human Behavior, 30, 476–484. https://doi.org/10.1016/j.chb.2013.06.020

Castro, R. (2019). Blended learning in higher education: Trends and capabilities. Education and Information Technologies, 24(4), 2523–2546.

Christensen, C. M., Horn, M. B., & Staker, H. (2013). Is K-12 Blended Learning Disruptive? An Introduction to the Theory of Hybrids. Clayton Christensen Institute for Disruptive Innovation. https://eric.ed.gov/?id=ed566878

Chu, T. H., & Chen, Y. Y. (2016). With good, we become good: Understanding e-learning adoption by theory of planned behavior and group influences. Computers & Education, 92-93, 37–52. https://doi.org/10.1016/j.compedu.2015.09.013

Cidral, W. A., Oliveira, T., Di Felice, M., & Aparicio, M. (2018). E-learning success determinants: Brazilian empirical study. Computers & Education, 122, 273–290. https://doi.org/10.1016/j.compedu.2017.12.001

Coates, H. (2006). Student engagement in campus-based and online education: University connections. New York: Routledge. https://doi.org/10.4324/9780203969465

Coherent curriculum, Edglossary (n.d.). https://www.edglossary.org/coherent-curriculum/

Cook, D. A., & Steinert, Y. (2013). Online learning for faculty development: A review of the literature. Medical teacher, 35(11), 930–937.

Dakhi, O., Jama, J., & Irfan, D. (2020). Blended learning: a 21st century learning model at college. International Journal of Multi Science, 1(08), 50–65. https://multisciencejournal.com/index.php/ijm/article/view/92

Delcker, J. (2022). Digitalisation in the curricula of vocational schools: text mining as an instrument of curricula analysis. Technology, Knowledge and Learning, 1–16.

Deng, L., & Tavares, N. J. (2013). From Moodle to Facebook: Exploring students' motivation and experiences in online communities. Computers & Education, 68, 167–176.

DESI (2022). The digital economy and society index. https://digital-strategy.ec.europa.eu/en/policies/desi

Dewan, M., Murshed, M., & Lin, F. (2019). Engagement detection in e-learning: a review. Smart Learning Environments, 6(1), 1–20.

Gaebel, M., Zhang, T., Stoeber, H. and Morrisroe, A. (2021). Digitally enhanced learning and teaching in European higher education institutions (DIGIHE).

European qualification framework (EOK). (n. d.). European qualification framework.

Eze, S. C., Chinedu-Eze, V. C., & Bello, A. O. (2018). The utilisation of e-learning facilities in the educational delivery system of Nigeria: A study of M-University. International Journal of Educational Technology in Higher Education, 15(34), https://doi.org/10.1186/s41239-018-0116-z

Findeisen, S., & Wild, S. (2022). General digital competences of beginning trainees in commercial vocational education and training. Empirical Research in Vocational Education and Training, 14(1), 1–21.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. Review of Educational Research, 74(1), 59–109. https://doi.org/10.3102/00346543074001059

Fry, K. (2001). E-learning markets and providers: Some issues and prospects. Education + Training, 43(4/5), 233–239. https://doi.org/10.1108/EUM0000000005484

Goh, F. C., Leong, M. C., Kasmin, K., Hii, K. P., & Tan, K. O. (2017). Students' experiences, learning outcomes and satisfaction in e-learning. Journal of E-learning and Knowledge Society, 13(2), 117–128. https://doi.org/10.20368/1971-8829/1298

Goodyear, P. (2020). Design and co-configuration for hybrid learning: Theorising the practices of learning space design. British Journal of Educational Technology, 51(4), 1045-1060. https://bera-journals.onlinelibrary.wiley.com/doi/abs/10.1111/bjet.12925

Hair, E., Halle, T., Terry-Humen, E., Lavelle, B., & Calkins, J. (2006). Children's school readiness in the ECLS-K: Predictions to academic, health, and social outcomes in first grade. Early Childhood Research Quarterly, 21(4), 431–454

Handelsman, M. M., Briggs, W. L., Sullivan, N., & Towler, A. (2005). A measure of college student course engagement. The Journal of Educational Research, 98(3), 184–192. https://doi.org/10.3200/JOER.98.3.184-192

Henrie, C. R., Halverson, L. R., & Graham, C. R. (2015). Measuring student engagement in technology-mediated learning: A review. Computers & Education, 90, 36–53. https://doi.org/10.1016/j.compedu.2015.09.005

Hodge, B., Wright, B., & Bennett, P. (2017). The role of grit in determining engagement and academic outcomes for university students. Research in Higher Education, 59(4), 448–460. https://doi.org/10.1007/s11162-017-9474-y

Hong, A. J., & Kim, H. J. (2018). College Students' Digital Readiness for Academic Engagement (DRAE) Scale: Scale development and validation. Asia-Pacific Education Researcher, 27(4), 303–312. https://doi.org/10.1007/s40299-018-0387-0

Hrastinski, S. (2019). What do we mean by blended learning?. TechTrends, 63(5), 564–569. https://link.springer.com/article/10.1007/s11528-019-00375-5

Huda, M. (2022), "Towards digital access during pandemic age: better learning service or adaptation struggling?". Foresight, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/FS-09-2021-0184

Islam, A. K. M. N. (2013). Investigating e-learning system usage outcomes in the university context. Computers & Education, 69, 387–399. https://doi.org/10.1016/j.compedu.2013.07.037

Ituma, A. (2011). An evaluation of students' perceptions and engagement with e-learning components in a campus-based university. Active Learning in Higher Education, 12(1), 57–68. https://doi.org/10.1177/1469787410387722

Jones, C. (2012). Networked learning, stepping beyond the Net Generation and digital natives. In L. Dirckinck-Holmfeld, V. Hodgson, & D. McConnell (Eds.), Exploring the theory, pedagogy, and practice of networked learning (pp. 27–41). New York, NY: Springer.

Jošt Lešer, V., & Berginc, D. 2023. Analysis of MBA skills from the employers' perspective: A case study. Advances in Business-Related Scientific Research Journal, 14(1), 45–57.

Kim, H., Hong, A., & Song, H. D. (2018). The relationships of family, perceived digital competence and attitude and learning agility in sustainable student engagement in higher education. Sustainability, 10(12), 4635.

Kiviniemi, M. T. (2014). Effects of a blended learning approach on student outcomes in a graduate-level public health course. BMC Medical Education, 14(1), 1–7. https://doi.org/10.1186/1472-6920-14–47

Krelová, K. K., Berková, K., Krpálek, P., & Kubisová, A. (2021). Attitudes of Czech College Students Toward Digital Literacy and Their Technical Aids in Times of COVID-19. Int. J. Eng. Pedagogy, 11(4), 130–147.

Lee, J., Song, H. D., & Hong, A. J. (2019). Exploring factors, and indicators for measuring students' sustainable engagement in e-learning. Sustainability, 11(4), 985.

Lockee, B. B. (2021). Online education in the post-COVID era. Nature Electronics, 4(1), 5–6.

López-Pérez, M. V., Pérez-López, M. C., & Rodríguez-Ariza, L. (2011). Blended learning in higher education: Students' perceptions and their relation to outcomes. Computers & Education, 56(3), 818–826.

Lucas, M., Bem-haja, P., Santos, S., Figueiredo, H., Ferreira Dias, M., & Amorim, M. (2022). Digital proficiency: Sorting real gaps from myths among higher education students. British Journal of Educational Technology, 53(6), 1885–1914.

Lyons, T., & Evans, M. M. (2013). Blended learning to increase student satisfaction: An exploratory study. Internet Reference Services Quarterly, 18(1), 43–53. https://doi.org/10.1080/10875301.2013.800626

Margaryan, A., Littlejohn, A., & Vojt, G. (2011). Are digital natives a myth or reality? University students' use of digital technologies. Computers & Education, 56(2), 429–440. https://doi.org/10.1016/j.compedu.2010.09.004

Martzoukou, K., Fulton, C., Kostagiolas, P., & Lavranos, C. (2020). A study of higher education students' self-perceived digital competences for learning and everyday life online participation. Journal of documentation, 76(6), 1413-1458.

Means, B., Toyama, Y., Murphy, R., & Bakia, M. (2013). The effectiveness of online and blended learning: A meta-analysis of the empirical literature. Teachers College Record, 115(3), 1–47.

Mehdinezhad, V. (2011). First-year students' engagement at the university. International Online Journal of Educational Sciences, 3(1), 47–66.

Mseleku, Z. (2020). A literature review of E-learning and E-teaching in the era of Covid-19 pandemic. International Journal of Innovative Science and Research Technology, 57(52), 588-597.

Naveed, Q. N., Muhammed, A., Sanober, S., Qureshi, M. R. N., & Shah, A. (2017). Barriers effecting successful implementation of e-learning in Saudi Arabian universities. International Journal of Emerging Technologies in Learning, 12(6), 94–107.

Núñez-Canal, M., de Obesso, M. D. L. M., & Pérez-Rivero, C. A. (2022). New challenges in higher education: A study of the digital competence of educators in Covid times. Technological Forecasting and Social Change, 174, 121270.

Oke, A., & Fernandes, F. A. P. (2020). Innovations in teaching and learning: Exploring the perceptions of the education sector on the 4th industrial revolution (4IR). Journal of Open Innovation: Technology, Market, and Complexity, 6(2), 31.

Olelewe, C. J., & Agomuo, E. E. (2016). Effects of B-learning and F2F learning environments on students' achievement in QBASIC programming. Computers & Education, 103, 76–86. https://doi.org/10.1016/j.compedu.2016.09.012

Orton-Johnson, K. (2009). "I've stuck to the path I'm afraid": Exploring student non-use of blended learning. British Journal of Educational Technology, 40(5), 837–847. https://doi.org/10.1111/j.1467-8535.2008.00860.x

Parkes, M., Stein, S., & Reading, C. (2015). Student preparedness for university e-learning environments. The Internet and Higher Education, 25, 1–10. https://doi.org/10.1016/j.iheduc.2014.10.002

Pham, L., Limbu, Y. B., Bui, T. K., Nguyen, H. T., & Pham, H. T. (2019). Does e-learning service quality influence e-learning student satisfaction and loyalty? Evidence from Vietnam. International Journal of Educational Technology in Higher Education, 16(7), 1–26. https://doi.org/10.1186/s41239-019-0136-3

Pozo Sanchez, S., López-Belmonte, J., Moreno-Guerrero, A. J., Sola Reche, J. M., & Fuentes Cabrera, A. (2020). Effect of bring-your-own-device program on flipped learning in higher education students. Sustainability, 12(9), 3729.

Ratten, V. (2020). Coronavirus (Covid-19) and the entrepreneurship education community. Journal of Enterprising Communities: People and Places in the Global Economy, 14(5), 753–764.

Roffe, I. (2002). E-learning: Engagement, enhancement, and execution. Quality Assurance in Education, 10(1), 40–50. https://doi.org/10.1108/09684880210416102

Saadé, R. G., Morin, D., & Thomas, J. D. E. (2012). Critical thinking in e-learning environments. Computers in Human Behavior, 28(5), 1608–1617. https://doi.org/10.1016/j.chb.2012.03.025

Shanta, S. A. (2021). Student performance evaluation between offline and online pedagogy: A critical analysis with possible suggestions. Journal of Management Info, 8(4), 231–252. https://readersinsight.net/jmi/article/view/2080

Slovenian qualification framework (SOK) (n.d.). Slovenian qualification framework. https://www.gov.si/teme/stopnje-in-ravni-visokosolske-izobrazbe/

Singh, A., Jha, S., Srivastava, D.K. and Somarajan, A. (2022), "Future of work: a systematic literature review and evolution of themes". Foresight, 24(1), 99–125. https://doi.org/10.1108/FS-09-2020-003

Singh, J., Steele, K., & Singh, L. (2021). Combining the best of online and face-to-face learning: Hybrid and blended learning approach for COVID-19, post vaccine, & post-pandemic world. Journal of Educational Technology Systems, 50(2), 140–171.

Staker, H., & Horn, M. B. (2012). Classifying K-12 blended learning. Innosight Institute. http://192.248.16.117:8080/research/handle/70130/5105

Tomas, L., Evans, N. S., Doyle, T., & Skamp, K. (2019). Are first year students ready for a flipped classroom? A case for a flipped learning continuum. International Journal of Educational Technology in Higher Education, 16(1), 1–22.

Vadnjal, J. (2017). Video-lectures: an effective complementary teaching method at business college. Serbian Journal of Management, 12(1), 107–120.

Wild, S., & Schulze Heuling, L. (2020). How do the digital competences of students in vocational schools differ from those of students in cooperative higher education institutions in Germany? Empirical Research in Vocational Education and Training, 12(1), 1–18.

Wilson, K. (2020). What does it mean to do teaching? A qualitative study of resistance to Flipped Learning in a higher education context. Teaching in Higher Education, 1–14.

Xiao, J., Sun-Lin, H. Z., Lin, T. H., Li, M., Pan, Z., & Cheng, H. C. (2020). What makes learners a good fit for hybrid learning? Learning competences as predictors of experience and satisfaction in hybrid learning space. British journal of educational technology, 51(4), 1203–1219.

Zupan, G. (2016). E-veščine in digitalna ekonomija. Statistični urad Republike Slovenije.

LEVEL OF TECHNICAL EFFICIENCY OF THE CONSTRUCTION SECTOR IN EU COUNTRIES

Michaela Staňková
Mendel University in Brno,
Czech Republic
michaela.stankova@mendelu.cz

Luboš Střelec*
Mendel University in Brno,
Czech Republic
lubos.strelec@mendelu.cz

Markéta Křetínská
Mendel University in Brno,
Czech Republic
xkretins@node.mendelu.cz

Abstract

This article deals with a quantitative assessment of the technical efficiency of the construction sector in EU countries. The construction sector is an essential part of any country's economy, yet the assessment of efficiency in this sector has been neglected. Our analysis covers a ten-year period, specifically the years between 2011 and 2020. Within this period, it is possible to observe not only long-term trends in changes in efficiency, but also changes in efficiency because of the COVID-19 pandemic. A total of five country groups were created with regard to the evolution of efficiency. The analysis shows that cyclical changes in the efficiency of the construction sector occurred in countries such as the Czech Republic, Germany, and Poland. According to the average efficiency values, the Czech Republic performs the best, while Ireland performs the worst.

Key Words

Construction sector; COVID-19; efficiency; European countries; number of enterprises.

*Corresponding Author

INTRODUCTION

The construction sector, which is an integral part of any country's economy, is an area of research in many studies. Studies are available focusing on the green technology innovation process along with the influence of state regulations. For example, according to Jaffe and Palmer (1997), tighter regulations provide a positive impetus for increased investment in innovation. Testa et al. (2011) emphasise that governments should maintain direct regulation in the field of the environment, which, if properly formulated, can have positive effects on competitive performance. Du et al. (2019) assume that the efficiency of green technology innovation reflects the efficiency of resource use. Doussoulin and Bittencourt (2022) focused on the circular economy and identified the demolition phase as the most problematic (inefficient) area.

If we exclude the area of environmental regulations, we also find current studies focusing on the evaluation of the construction sector itself. For example, Kanyilmaz et al. (2022) address the role of metal 3D printing in increasing quality and resource efficiency in the construction sector. More and more new studies are devoted to the development of the construction industry in China, as the largest construction market in the world, see for example Hou et al. (2021) or Zhang, H. et al. (2022). However, studies focusing on Europe are still scarce.

In studies by Zhang, C. et al. (2022) and Gálvez-Martos et al. (2018), attention is paid to the waste generated both during construction and demolition. However, these studies are not quantitative in nature and are not based on financial data. If we look for studies based on financial data for the European region, we will find, for example, a study by Roubalová and Viskotová (2019) or Kalantzis and Niczyporuk (2022). However, these studies focus primarily on the productivity of the construction sector (especially labour productivity) and not on efficiency itself. In everyday speech, these two terms are sometimes confused, because both productivity and efficiency deal with the ratio of outputs and inputs, but there are no links to other entities when calculating productivity. The calculation of efficiency is more complicated from a mathematical point of view, as it is necessary to take into account the production possibilities of all other units (enterprises or entire countries). Nowadays, we can find studies that use parametric or non-parametric methods to assess efficiency. However, each of these methods has different assumptions and therefore different strengths and weaknesses. Hollingsworth (2003) or Odeck and Brathen (2012) refer to the data envelopment analysis (DEA) method as the dominant method in the field of non-parametric methods (regardless of the chosen sector) and the stochastic frontier analysis method (SFA) as the main method from the parametric approaches. In the case of the SFA method (as a representative of parametric approaches), there is criticism of the need to make assumptions about the probability distribution. However, the advantage of using this method is that it can distinguish between inefficiency and noise. In contrast, the DEA method is deterministic and therefore does not allow for any randomness due to, for example, luck. However, as a representative of

nonparametric methods, it does not require any assumptions about the specific probability distribution.

The efficiency of the construction sector was investigated by Křetínská and Staňková (2021), based on the DEA method. Their investigation covered the period between 2015 and 2017 and analyses were carried out for a total of 17 European countries. Their research shows that, in general, these countries succeed in increasing efficiency over time. They identified enterprises from Bulgaria as being the least efficient. On the contrary, countries such as Austria, Belgium, Denmark, the Netherlands, and Spain showed the best results. Nazarko and Chodakowska (2015) also investigated the efficiency of the construction sector in Europe, but they compiled a DEA model for the years between 2006 and 2012. Even their results show positive trends in the area of changes in efficiency over time. The results regarding the best and worst countries are also consistent, as they also identified Spain as the best and Bulgaria as the worst in terms of efficiency scores achieved.

In their later research, Nazarko and Chodakowska (2017) used both the SFA and DEA method to evaluate the efficiency of the construction sector in European countries with a detailed focus on labour efficiency. According to them, the use of both methods increases the reliability of the results. In their research, they further emphasise that efficiency has a significant link to the level of development of the given country.

Unfortunately, as already mentioned above, we currently have only a limited number of studies focusing on the evaluation of the efficiency of the European construction sector, and a large part of them are studies from around the turn of the century, see for example Brauers et al. (2013), Horta et al. (2013) or Kildienė et al. (2011). In 2020, the COVID-19 pandemic hit the economy unexpectedly and its impact on the sector's efficiency has not yet been sufficiently explored.

It is generally assumed that the COVID-19 pandemic has harmed most sectors, with only pharmaceutical companies having large business opportunities; see for example Mirmozaffari et al. (2022) and Devi et al. (2020). Outside the pharmaceutical and healthcare sectors, the main focus has so far been on the effects of the pandemic in areas such as tourism (see Hensler et al., 2022 or Park et al., 2022) and education (see Seow et al., 2022 or Yin et al., 2022). For the manufacturing or construction sector, detailed analyses of changes in productivity and efficiency in EU countries due to the pandemic are currently lacking.

Although it is possible to track how many businesses closed down during the pandemic, according to the results of e.g., Gaebert and Staňková (2020), a decrease in the absolute number of businesses in a given sector can be beneficial for the economy. Their research showed that if enterprises in which resources are wasted leave the market, then paradoxically the production efficiency of the entire market can benefit from their departure, if the production of these enterprises is taken over by their competitors with a more efficient transformation process.

In addition to the areas mentioned above, it can be noted that much of the research conducted to-date is micro-economically oriented. For

example, the aforementioned Horta et al. (2013) conducted their analysis based only on micro data from 118 enterprises. Although they tried to generalise their results with other procedures, they did not provide a full-fledged analysis of the construction sector. In practice, these forms of micro-analysis are typically limited to a specific sub-sector of the construction industry and/or to a limited regional area, see for example Staňková and Hampel (2019) and Zubizarreta et al. (2017).

In this article, attention is paid to estimating the efficiency of the whole construction sector in selected EU countries. Efficiency is understood in this article as technical efficiency, which considers how many resources a given unit uses to achieve its output. Like Nazarko and Chodakowska (2017) or Křetínská and Staňková (2021), we will relate output (production) to factor inputs used. Since the transformation process of inputs to outputs is influenced by the available technology, the term technical efficiency is used for this area of assessment. Regarding the chosen construction sector, it can be assumed that human labour together with machinery or other equipment will have a major influence on efficiency, so we will focus on labour and capital factors in the area of inputs.

The objectives of this article are as follows:
- to calculate efficiency scores of the construction sector in selected EU countries in the last decade of available data;
- to assess the evolution of efficiency over time;
- to determine whether there have been important efficiency changes in 2020 with respect to the COVID-19 pandemic;
- to divide countries into groups according to their efficiency development; and
- to test whether there is also a relationship between the number of enterprises and efficiency in the construction sector.


MATERIALS AND METHODS

The analysis is based on a two-factor Cobb-Douglas production function like in Staňková and Hampel (2021) and Varvařovská and Staňková (2021). Annual aggregated data from between 2011 and 2020 obtained from the Eurostat database were used to calculate the efficiency of the individual EU countries. The labour factor is expressed in this article in the value of total wages/salaries paid (in millions of euros) in the construction sector. Unlike the commonly used absolute number of employees, the variable we choose allowed us to capture a different "cost of work" in each country. The capital factor is understood here as gross fixed capital formation (in millions of euros) in the construction sector. Production value in millions of euros represents the output variable.

Unfortunately, one of the EU countries, Malta, did not have the necessary data available. Therefore, only 26 Member States were included in the analysis (i.e., excluding Malta). The development of average values (for the whole dataset) in the monitored period is shown in Figure 1. In addition to the variables entering directly into the efficiency assessment, this figure also

plots the variable of the average number of enterprises, which, according to the results in Gaebert and Staňková (2020), may be related to the efficiency results.

Figure 1: The development of the average values of the variables used (labour, capital, and output) in contrast to the development of the average number of enterprises in the construction sector
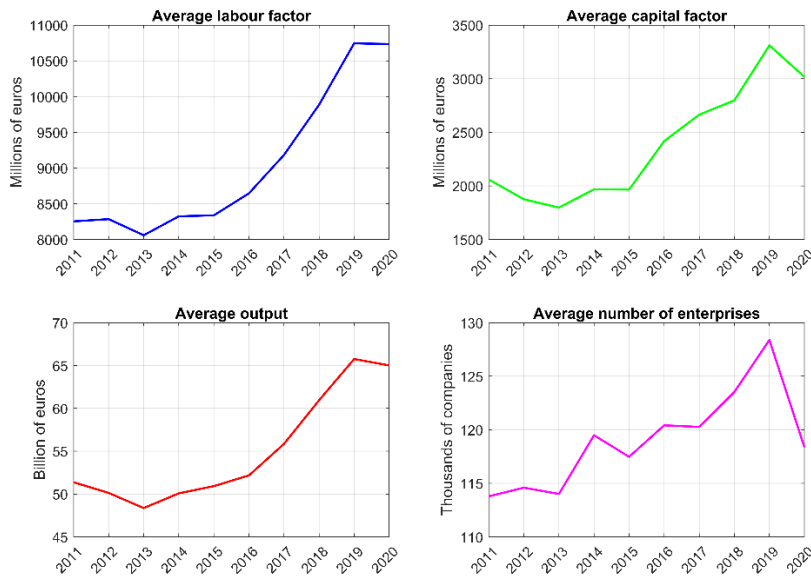
The average values of the labour factor, capital, output, and number of enterprises for the whole sector show a similar development over time. The European construction sector, like other sectors, was hit by the economic crisis in 2009. Due to the relatively high level of uncertainty, the recession lasted until 2013. The construction sector only began to recover after 2013. Continuous growth in all three variables was then disrupted by the COVID-19 pandemic in 2019. After 2019, there was a large drop in the average number of enterprises in the sector. The closure of so many enterprises was also reflected in a decline in the average values of capital and output. Thanks to the efforts of individual European governments, there was no significant decline in the average values of the labour factor. However, the question remains whether, in an effort to maintain employment, governments contributed to maintaining the competitiveness of the construction sector or reduced its efficiency.

The SFA method was chosen for efficiency estimation because of its valuable property of distinguishing inefficiency from noise. Due to the macroeconomic nature of the data, SFA panel models were estimated following Greene (2005):

$$\ln y_{it} = \alpha_i + \ln f(x_i; \beta) + \varepsilon_i,$$
$$\varepsilon_i = v_{it} - u_{it},$$

where α_i is a constant related to unit i, $i = 1, \dots, I$, y_{it} is the observed output scalar of each unit in period t, $t = 1, \dots, T$, x_i is a vector of inputs, $f(x_i; \beta)$ represents the production frontier (based on specific production function), β is a vector of technology parameters. The composed error term ε_i includes both units' inefficiency u_{it} and standard error term v_{it}. Furthermore, it is worth noting that all distributional assumptions for building an empirical model according to Greene (2005) are met in our case.

Greene's models (Greene, 2005) can be estimated on the basis of both fixed and random effects. Furthermore, for the SFA method, it is necessary to choose an assumption regarding the estimation of (in)efficiency either based on the ideas of Jondrow et al. (1982) or on the Battese and Coelli (1988) procedure. Given the chosen period, it can be assumed that it will be necessary to also capture in the model the increase in production possibilities due to technological progress. Similar to Staňková and Hampel (2021), an artificial time variable was added to the model to capture this increase. Last but not least, it was necessary to choose one of the common probability distributions for inefficiency. The distribution functions of exponential and half-normal are most often used in practice.

Technical efficiency (TE) of the i-th unit can be derived based on level of inefficiency as:

$$TE_i = \exp(-u_i).$$

As will be seen, in this analysis, the final choice was to focus on the random effect panel model based on a JLMS estimator based on the conditional mean:

$$E(\exp(-u_i)|\varepsilon_i),$$

with an exponential probability distribution of inefficiency:

$$\hat{E}(u) = \hat{\sigma}_u = \sqrt{\frac{RSS}{I - (K + 1)}},$$

where the mean value of the inefficiency $\hat{E}(u)$ is calculated based on the magnitude of the deviations $\hat{\sigma}_u$, which are derived using the residual sum of squares RSS. I in this equation represents the sample size and K indicates the number of model parameters that need to be estimated. Furthermore, it was found that there was a significant increase in production possibilities over the period due to technological progress, so a variable representing efficiency growth over time was added to the model like in Staňková and Hampel (2021).

Given the scope of the analysis, another analytical tool was used to form homogeneous groups of countries according to their obtained efficiency. In an unconventional way, we clustered countries based on the efficiency values in each year using cluster analysis. In the event that the obtained time series of country-specific efficiencies were not stationary, the process of station-arising the time series through differencing as in Nchor et al. (2015) was undertaken.

Cluster analysis allows for different settings (both for calculating distances between objects and between clusters). In the case of calculating the distance between clusters, we use Ward's method, which is very popular

in practice, see for example Zámková et al. (2021). This is a variability minimisation algorithm that considers the inner square distance. In calculating the distance between clusters, we used a technique that focuses on correlations, specifically the value of one minus the sample correlation between points (treated as sequences of values). Technical details on cluster analysis can be found in Everitt et al. (2011).

Correlation analysis was used to test whether there is a link between efficiency and the number of enterprises in the construction sector, as has been shown for example in the pharmaceutical industry by Gaebert and Staňková (2020). In the case of correlation analysis, assumptions regarding normality and stationarity must be met. The normal probability distribution was verified using the Shapiro–Wilk and Jarque-Bera test like in Stehlík et al. (2023). The aggregated values in Figure 1 show that the stationarity assumption is likely to be violated. In this case, the analysis would have to be performed on differenced time series of efficiency and number of enterprises.

Panel SFA models were estimated in Stata (version 17 SE), and comparison of the results and graphical outputs was made in MATLAB (version 2023a).

RESULTS

First, attention is given to the estimated efficiency score itself. Subsequently, a cluster analysis is described using the obtained efficiency score. The last part of the results is devoted to examining the possible link between the number of enterprises and the efficiency of the sector.

Efficiency Evaluation Results

In this section, we present the results of the SFA model based on random effects through estimation following the procedure of Jondrow et al. (1982), since in this setting all the estimated model parameters were statistically significant. According to this model, the level of efficiency in the construction sector is relatively high. The numerical results of the efficiency of individual countries are shown in Table 1. In terms of the average efficiency values over the whole period under review, Czech enterprises are doing the best, with France coming in second place. By contrast, Ireland achieved the worst average results overall. The second worst country is Latvia. A positive finding about the construction sector in the EU countries is that even in these worst countries the average efficiency has not fallen below 60%.

Based on the results of the efficiency estimates, the initial impacts of the COVID-19 pandemic can also be observed. In Table 1, it can be seen that 19 EU countries experienced a decline in efficiency level in 2020. For Denmark, Germany, Italy, Poland, and Romania, the efficiency scores in 2020 are higher than in 2019, but in absolute terms the increase is between 0.1 and 6 percentage points, which can be considered an insignificant

change. Only Belgium (less than 10 percentage points) and Bulgaria (almost 29 percentage points) show a significant increase in efficiency.

According to the European Construction Industry Federation (FIEC) reports (FIEC, 2021a), the Belgian construction industry has largely differentiated itself from other EU countries, as even in 2020 the Belgian construction industry was able to maintain its production capacity. Even in this period, the outlook in terms of employment was positive, as employment in this sector was expected to grow in 2021. The FIEC (2021b) reports for Bulgaria also reveal positive efficiency results in 2020, as they show that since 2017, housebuilding in Bulgaria has experienced a huge boom (roughly double the volume compared to previous years). Although the number of new building permits issued declined slightly in 2020, the demand for housebuilding here was so high compared with previous years that long-term contracts sustained production in this sector.

Table 1: Results of the efficiency scores in each period together with the average result and the derived country ranking

Country	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average	Rank
Austria	0.933	0.934	0.917	0.901	0.909	0.905	0.903	0.894	0.871	0.825	**0.899**	**5**
Belgium	0.827	0.726	0.737	0.769	0.867	0.942	0.921	0.822	0.869	0.965	**0.845**	**13**
Bulgaria	0.928	0.939	0.898	0.938	0.977	0.583	0.651	0.708	0.648	0.935	**0.821**	**15**
Croatia	0.943	0.911	0.917	0.936	0.963	0.918	0.879	0.853	0.899	0.809	**0.903**	**3**
Cyprus	0.584	0.563	0.636	0.653	0.702	0.829	0.890	0.940	0.947	0.865	**0.761**	**19**
Czech Rep.	0.936	0.868	0.893	0.939	0.957	0.899	0.928	0.944	0.938	0.899	**0.920**	**1**
Denmark	0.830	0.847	0.798	0.819	0.879	0.888	0.889	0.920	0.924	0.945	**0.874**	**10**
Estonia	0.897	0.938	0.912	0.899	0.783	0.798	0.936	0.893	0.827	0.775	**0.866**	**11**
Finland	0.869	0.872	0.854	0.866	0.893	0.920	0.941	0.916	0.914	0.912	**0.896**	**6**
France	0.918	0.938	0.925	0.902	0.913	0.915	0.894	0.896	0.930	0.847	**0.908**	**2**
Germany	0.890	0.877	0.874	0.883	0.880	0.874	0.888	0.934	0.902	0.935	**0.894**	**7**
Greece	0.517	0.698	0.727	0.945	0.974	0.776	0.925	0.790	0.790	0.641	**0.778**	**18**
Hungary	0.554	0.474	0.618	0.821	0.815	0.616	0.769	0.951	0.964	0.893	**0.747**	**21**
Ireland	0.613	0.359	0.540	0.507	0.535	0.650	0.630	0.713	0.747	0.734	**0.603**	**25**
Italy	0.905	0.869	0.852	0.812	0.743	0.680	0.666	0.671	0.668	0.679	**0.754**	**20**
Latvia	0.922	0.914	0.885	0.648	0.584	0.354	0.464	0.503	0.417	0.346	**0.604**	**24**
Lithuania	0.796	0.727	0.724	0.872	0.754	0.575	0.585	0.656	0.440	0.431	**0.656**	**23**
Luxembourg	0.835	0.863	0.824	0.873	0.916	0.941	0.940	0.948	0.953	0.900	**0.899**	**5**
Netherlands	0.748	0.664	0.659	0.713	0.757	0.817	0.946	0.952	0.962	0.956	**0.817**	**17**
Poland	0.775	0.610	0.697	0.936	0.905	0.830	0.888	0.933	0.930	0.937	**0.844**	**14**
Portugal	0.976	0.932	0.881	0.793	0.820	0.730	0.812	0.853	0.851	0.806	**0.845**	**12**

Romania	0.954	0.953	0.965	0.885	0.790	0.633	0.556	0.446	0.378	0.437	**0.700**	**22**
Slovakia	0.754	0.678	0.560	0.764	0.959	0.854	0.923	0.932	0.935	0.835	**0.820**	**16**
Slovenia	0.938	0.952	0.952	0.965	0.911	0.765	0.885	0.933	0.858	0.769	**0.893**	**8**
Spain	0.949	0.863	0.807	0.880	0.920	0.894	0.891	0.939	0.912	0.858	**0.891**	**9**
Sweden	0.879	0.856	0.840	0.857	0.907	0.908	0.946	0.938	0.943	0.928	**0.900**	**4**

The Clusters Created

Based on the results in Table 1, it was possible to make an initial division of countries into a group of those whose efficiency increased between 2011 and 2020 and into a group of countries where efficiency, on the contrary, decreased, see Table 2. Using this criterion, we divide the countries into two groups of almost equal size. The largest increase was recorded in countries such as Hungary and Cyprus, on the other hand, the largest decrease was in countries such as Latvia and Romania.

Table 2: Division of countries into two groups according to their overall change in efficiency

Efficiency level	Country
Increased	Belgium, Bulgaria, Cyprus, Denmark, Finland, Germany, Greece, Hungary, Luxembourg, Netherlands, Poland, Slovakia, Sweden
Decreased	Austria, Croatia, Czech Republic, Estonia, France, Ireland, Italy, Latvia, Lithuania, Portugal, Romania, Slovenia, Spain

If we were to focus on the average results for the entire period under review, the Czech Republic achieves the best results (efficiency at the level of 92%), but it has a specific development of efficiency. In absolute terms, this country recorded the smallest drop in efficiency between 2011 and 2020 and, unlike other countries, it shows a relatively constant trend with a hint of a cyclical element with a period of 4 years. This can be influenced by the economic cycle or even the political situation (frequency of elections). As average values are strongly influenced by differences in trends, countries needed to be further differentiated according to developments in efficiency changes.

Due to the scope of the analysis, we incorporated the method of cluster analysis into this process, which enables the division of countries into several clusters. In order to really evaluate the development of efficiency and thereby emphasise changes, a cluster analysis was performed on differentiated efficiency values (mainly to minimise the effects of non-stationarity). A total of five clusters were created. The resulting dendrogram along with the evolution of efficiency (differentiated efficiency values) are included in Figure 2.

The first cluster (blue in the dendrogram) is made up of five countries. These are mainly Central European countries together with one Baltic country. These countries are not only connected by geographical proximity,

but from the point of view of the efficiency trend, a certain cyclicality can be seen in the results. Although it is difficult to fully examine the cyclical component in such a short period of time, two recurring fluctuations are evident from Figure 2. These changes are most significant in Hungary. With respect to the scale, the Czech Republic has the smallest fluctuations.

The first cluster contains three of the four V4 countries. Only Slovakia is included in the fifth (yellow) cluster. However, in terms of the evolution of efficiency, this country also has fluctuations in common with the countries of the first cluster. However, since Slovakia did not have such significant fluctuations as e.g., Poland in the second half of the period under review, it was placed into the fifth cluster together with Belgium, Denmark, Finland, the Netherlands, Spain, and Sweden.

Figure 2: Dendrogram and the evolution of country efficiency in each cluster
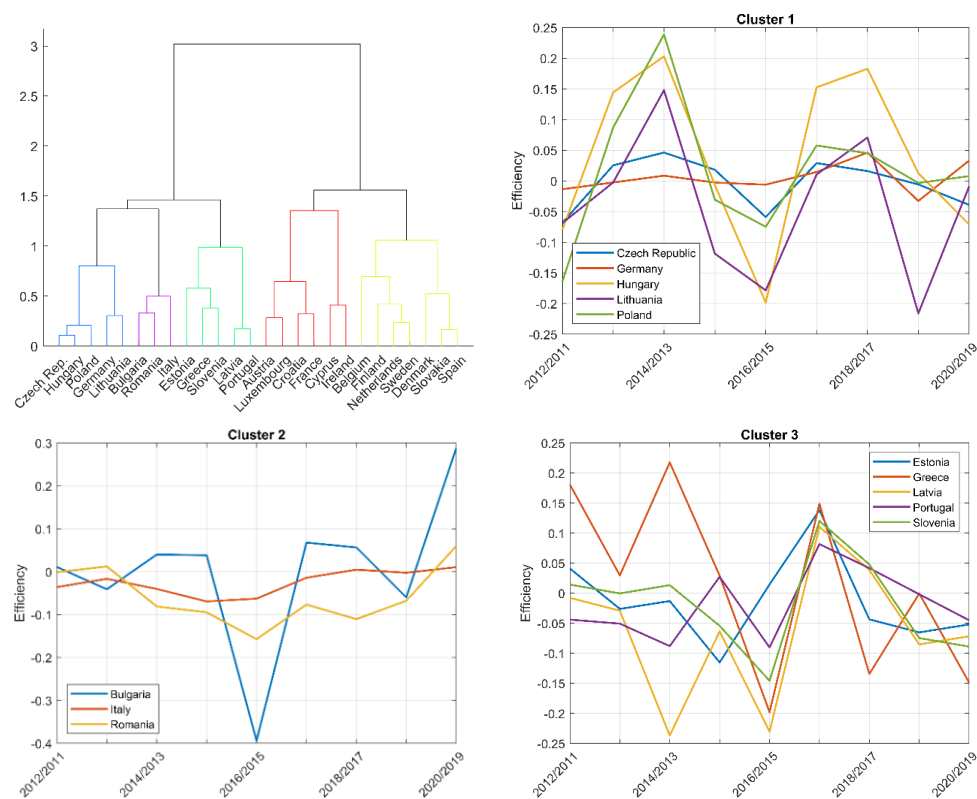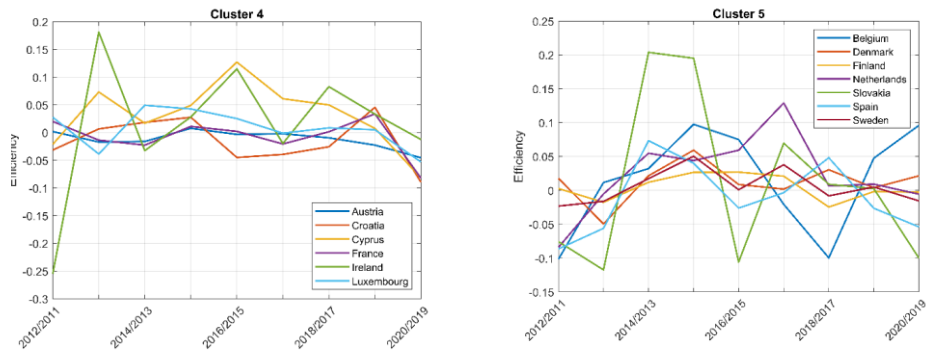
Countries in the second cluster (purple on the dendrogram) had relatively high efficiency scores (over 90%) in 2011. However, during the period under review, Bulgaria, Italy, and Romania experienced a systematic decline in efficiency scores, which peaked in 2015 (in the case of Romania, there was also a decline in 2019). However, from this point onwards, there are signs of a positive trend in the efficiency score. Nevertheless, the difference between the maximum and minimum measured efficiency scores over the whole period under review is e.g., almost 59 percentage points in the case of Romania. Major changes would be needed for these countries to reach their 2011 levels of efficiency.

The third cluster (green on the dendrogram) connects the efficiency trends of the countries, especially in the second half of the period under review. Estonia, Greece, Latvia, Lithuania, Portugal, and Slovenia have almost identical trends in differentiated efficiency values between 2015 and 2020. According to reports from the European Commission, the construction sector in these countries did not fare well around 2015. However, in 2017, there was a recovery in these countries. In the case of Greece, for example, this was due in no small part to the efforts of the government itself (European Commission, 2018). However, as we can see by the evolution of efficiency after 2017, these "injections" did not help the construction sector in the long run.

The last so far unmentioned cluster 4 (red on the dendrogram) brings together Austria, Croatia, Cyprus, France, Ireland, and Luxembourg. Perhaps the most dramatic efficiency development in this group is Ireland, which saw a significant drop in efficiency after 2011. It was not until the second half of the period under review that Ireland reached a similar level of efficiency to the other countries in this cluster. In this case, Ireland was helped by Strategy 2020, which the government introduced in 2014 (European Commission, 2014). A set of 75 policies were intended to fix the most serious problems in the Irish construction industry, which as we can see actually helped to increase the efficiency of the construction sector in this country. Even so, the country still lags far behind other EU countries.

If we want to generalise the level of efficiency over the whole period for each cluster, we find that countries in the fourth and fifth clusters generally perform the best, see Table 3. On the other hand, countries in the third and second clusters perform the worst.

Table 3: Average efficiency results for each country cluster, including the derived ranking

Year	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
2011	0.790	0.929	0.850	0.804	0.836
2012	0.711	0.920	0.887	0.761	0.786
2013	0.761	0.905	0.871	0.793	0.751
2014	0.890	0.878	0.850	0.795	0.810
2015	0.862	0.836	0.814	0.823	0.883
2016	0.759	0.632	0.684	0.860	0.889
2017	0.812	0.624	0.804	0.856	0.922
2018	0.884	0.608	0.794	0.874	0.917
2019	0.835	0.565	0.749	0.891	0.923
2020	0.819	0.684	0.667	0.830	0.914
Average	**0.812**	**0.758**	**0.797**	**0.829**	**0.863**
Rank	**3**	**5**	**4**	**2**	**1**

Comparison of Efficiency with the Number of Enterprises

Correlation analysis was used to determine whether there is a link between the number of enterprises and country efficiency. Since both time series were non-stationary so as not to bias the results, the analysis was also performed on differenced time series. The results of both Shapiro–Wilk and Jarque-Bera tests at a significance level of 5% showed that the assumption of a normal probability distribution was met (all p-values were greater than 0.05) and therefore the Pearson correlation coefficient was calculated. The calculated correlation coefficients for each country are given in Table 4.

Table 4: Correlation coefficient values between the number of enterprises and the level of efficiency for each country.

Cluster No.	Country	Coefficient	Cluster No.	Country	Coefficient
1	Czech Rep.	-0.053	4	Austria	-0.481
	Germany	-0.036		Croatia	-0.123
	Hungary	0.054		Cyprus	-0.266
	Lithuania	0.362		France	-0.054
	Poland	0.010		Ireland	0.052
2	Bulgaria	0.212		Luxembourg	-0.012
	Italy	0.032	5	Belgium	0.361
	Romania	0.359		Denmark	0.320
3	Estonia	0.200		Finland	-0.314
	Greece	-0.389		Netherlands	-0.351

	Latvia	-0.240		Slovakia	0.438
	Portugal	0.447		Spain	0.839
	Slovenia	-0.535		Sweden	0.254

Within the first cluster, it can be seen that Lithuania differs from the other countries not only in terms of geographical area, but also in the size of the correlation coefficient. For all other countries in this cluster, the value of the correlation coefficient is almost zero, indicating the independence between efficiency and the number of enterprises. In the case of Lithuania, we are in an interval typically indicating weak dependence. Even in the case of the second cluster, the correlation results are not at the same level, as the correlation coefficient of Italy is also almost zero, but Bulgaria and Romania show a weak dependence.

In the case of the third cluster, we can generally speak of a week/moderate dependence, but Greece, Latvia, and Slovenia show a negative dependence, and Estonia and Portugal show a positive dependence. In the fourth cluster, the calculated correlation coefficient is negative for all countries except Ireland. However, in the case of Ireland, as in the case of, say, France, the number is so close to zero that it is possible to speak of independence. The fifth cluster as a whole contains the strongest correlations, but there are also countries with both positive and negative correlations.

For countries where the correlation coefficient values are negative, the same situation occurred as in the German pharmaceutical industry in the study by Gaebert and Staňková (2020). In this case, the exit of enterprises from the market is paradoxically positively related to the efficiency of the sector as a whole. Therefore, in the case of countries such as Slovenia, Greece, the Netherlands, Finland, and Latvia, enterprises that would otherwise operate inefficiently in the market are being priced out of the market.

A different situation can be expected for countries where positive dependencies have been identified. The strongest positive dependence (of 0.839) was identified in the case of Spain (despite the low number of degrees of freedom, this is the only statistically significant relationship in this case). Although Spain shows neither a clear upward nor a clear downward trend (either in efficiency or in the number of enterprises), partial increases/decreases in the number of enterprises do indeed follow increases/decreases in efficiency. So here, generally speaking, the arrival of new enterprises can make the sector more efficient. Conversely, if enterprises leave the sector, this will be reflected in reduced efficiency.

DISCUSSION

As already mentioned, there are currently no comprehensive studies examining the efficiency of the construction sector in European countries in recent years. Therefore, the validity of our results can only be supported by

studies conducted on older years, which also typically cover a smaller geographical area. Probably the closest comparison can be made with the study by Křetínská and Staňková (2021), although their study was conducted using a completely different method (data envelopment analysis) for only a few European countries between 2015 and 2017. Unfortunately, their model did not enable a clear-cut determination of the best country, but in both studies, developed countries such as Austria, France, and Germany are among the most effective representatives between 2015 and 2017. Similarities can also be found in the results of the worst performing enterprises. When for the years between 2015 and 2017, according to our results, Latvia ranked the worst with an average efficiency of around 47%, in the study by Křetínská and Staňková (2021), Latvia has an efficiency of around 50%. Given the similar results of two quite different methods, they can be considered sufficiently robust.

Our analysis found that despite the efforts of the European Union, the level of efficiency varies between Member States. Countries such as the Czech Republic and France have an average efficiency of over 90%, while Hungary and Italy are at 60%. Moreover, the correlation analysis between the number of enterprises and the efficiency scores showed that different principles are established in different countries. In countries where a negative correlation has been shown, there is a situation where there are still enterprises in the market that are not operating efficiently and the market would benefit from them leaving, as has happened in the pharmaceutical industry since Gaebert and Staňková (2020). Here, therefore, governments should encourage the transition (either of enterprises or of employees) to other sectors. It is well known that a large part of the workforce in this sector is regarded as unskilled labour or low-wage labour, see for example Soundararajan (2019). Therefore, there is scope to retrain these workers by retraining them to work in other related fields (for example, manufacturing). From an enterprise perspective, focus should then be on removing barriers to entering individual markets to make it easier for them to transfer their activities.

However, within countries where a positive link has been identified, it is advisable to support enterprises and their employees in the sector. Here, on the other hand, the findings on wage levels and employee productivity could be used. Higher productivity may then be positively reflected in higher efficiency. There has been a large amount of research on the link between wage levels and labour productivity. Here we can use the wage efficiency theory by Yellen (1984), which states that an increase in wages leads to an increase in the productivity of the worker. Based on these ideas, it is possible to increase labour productivity and consequently the efficiency of the sector as a whole, while maintaining (or even increasing) the number of enterprises in the sector. But as recent results, such as Kubicová and Blašková (2021), show, income levels alone are not the only determinant of individuals' actual well-being.

By including data from 2020, the analysis was able to uncover efficiency drops due to the COVID-19 pandemic. The COVID-19 pandemic completely disrupted the natural processes in the market, as there were government

regulations that enterprises could not influence in any way. In an effort to fight against a brand-new challenge, the governments of individual countries put various measures in place. What they had in common, however, is that they implemented measures in an attempt to protect their citizens at the expense of the economy. Everyone assumed that in 2020, which we can describe as the beginning of the pandemic in Europe, the economy would be disrupted, but no one could say in advance how large it would be and what impact it would have on the efficiency of individual sectors. With the passage of time, however, we have macroeconomic data available that will help us quantify the effects of the pandemic.

In the case of the construction sector, according to the European Construction Industry Federation (FIEC, 2022), the COVID-19 pandemic provoked an unprecedented economic crisis. Based on their reports, we can measure the impact, for example, by a 5.9% decline in EU GDP in 2020. Based on our results, we can conclude that the pandemic caused an average drop in efficiency of more than 2 percentage points in the EU construction sector. The main problem can be identified as the lack of manpower, as demonstrated by reports from Germany, where roughly 25% of construction enterprises reported this problem. Another large problem is the price of input materials. However, this problem is not only related to the COVID-19 pandemic but is further exacerbated by the ongoing war in Ukraine. There has been a disruption to established supply chains, leading to price increases, which combined with energy growth has had a significant impact on business costs.

However, as mentioned above, not all EU countries saw a decline in efficiency in 2020. For example, Bulgaria, saw a significant increase in efficiency. Unfortunately, even our study cannot fully analyse the impact of the COVID-19 pandemic. Future research will also need to conduct analyses (with a time lag) to see how individual enterprises in the countries concerned have coped with this situation. According to the European Commission report (2019), this sector was already undergoing significant changes before the pandemic. Enterprises in this sector have to adapt to new trends in smart materials with an emphasis on environmental aspects or intelligent systems and smart technologies for building operation management. However, despite these modernisations, the construction sector and its efficiency are still heavily dependent on the skills of its employees.

CONCLUSION

This article focused on a quantitative assessment of the efficiency of the construction sector in EU countries. Our analysis covers the period between 2011 and 2020. The results of our analysis show that despite the efforts of the European Union, there are still significant differences in efficiency at the level of individual countries. The efficiency of the best ranked countries (such as the Czech Republic or France) is around 90%, while countries such as Ireland are around 30 percentage points less efficient. In terms of the evolution of efficiency, it was found that in some countries (Czech Republic,

Germany, Hungary, Lithuania, Poland, and possibly also Slovakia) there is a hint of a cyclical component. Efficiency here therefore corresponds to other factors (e.g., the economic cycle or political elections).

Attention was also paid to the correlation between sector efficiency and the number of enterprises in the sector. It was found that for some countries there are negative correlations, while for others there are positive correlations. On the basis of this finding, it can be concluded that individual countries have to choose different strategies to improve their efficiency levels.

ACKNOWLEDGEMENT

REFERENCES

Battese, G.E., & Coelli, T. Prediction of firm-level technical efficiencies with a generalized frontier production function and panel data. Journal of Econometrics, 38(3), 387–399.

Brauers, W., Kildiene, S., Zavadskas, E.K., & Kaklauskas, A. (2013). The construction sector in twenty European countries during the recession 2008–2009 – country ranking by MULTIMOORA. International Journal of Strategic Property Management, 17 (1), 58–78.

Devi, S., Warasniasih, S., & Masdiantini, P.R. (2020). The Impact of COVID-19 Pandemic on the Financial Performance of Firms on the Indonesia Stock Exchange. Journal of Economics Business and Accountancy Ventura, 23 (2), 226–242.

Doussoulin, J. P., & Bittencourt, M. (2022) How effective is the construction sector in promoting the circular economy in Brazil and France? A waste input-output analysis. Structural Change and Economic Dynamics, 60, 47–58.

Du, J.L., Liu, Y., & Diao, W.X. (2019). Assessing regional differences in green innovation efficiency of industrial enterprises in China. International Journal of Environmental Research and Public Health, 16 (6), 940.

Everitt, B.S., Landau, S., Leese, M., & Stahl, D. (2011). Cluster analysis. 5th ed. Chichester: John Wiley & Sons.

FIEC - European Construction Industry Federation. (2021a). Statistical Report: Belgium. https://fiec-statistical-report.eu/2021/belgium

FIEC - European Construction Industry Federation. (2021b). Statistical Report: Bulgaria.

Gaebert, T., & Staňková, M. (2020). Efficiency development in the German pharmaceutical market. Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis, 68 (5), 877–884.

Gálvez-Martos, J., Styles, D., Schoenberger, H., & Zeschmar-Lahl, B. (2018). Construction and demolition waste best management practice in Europe. Resources, Conservation and Recycling, 136, 166–178.

Greene W. (2005). Reconsidering heterogeneity in panel data estimators of the stochastic frontier model. Journal of Econometrics, 126(2), 269–303.

Henseler, M., Maisonnave, H., & Maskaeva, A. (2022). Economic impacts of COVID-19 on the tourism sector in Tanzania. Annals of Tourism Research Empirical Insights, 3(1), 100042.

Hollingsworth, B. (2003). Non-Parametric and Parametric Applications Measuring Efficiency in Health Care. Health Care Management Science, 6(4), 203–218.

Horta, I.M., Camanho, A.S., Johnes, J., & Johnes, J. (2013). Performance trends in the construction industry worldwide: an overview of the turn of the century. Journal of Productivity Analysis, 39, 89–99.

Hou, H. et al. (2021). Energy-related carbon emissions mitigation potential for the construction sector in China. Environmental Impact Assessment Review, 89, 106599.

Jaffe, A. B., & Palmer, K. (1997). Environmental regulation and innovation: a panel data study. The Review of Economics and Statistics, 79 (4), 610-619.

Jondrow, J., Lovell, C.A.K., Materov, I.S., & Schmidt, P. (1982). On the estimation of technical inefficiency in the stochastic frontier production function model. Journal of Econometrics, 19 (2-3), 233–238.

Kalantzis, F., & Niczyporuk, H. (2022). Labour productivity improvements from energy efficiency investments: The experience of European firms. Energy, 252, 123878.

Kanyilmaz A., et al. (2022). Role of metal 3D printing to increase quality and resource-efficiency in the construction sector. Additive Manufacturing, 50, 102541.

Kildienė, S., Kaklauskas, A. & Zavadskak E.K. (2011). OPRAS based comparative analysis of the European country management capabilities within the construction sector in the time of crisis. Journal of Business Economics and Management, 12(2), 417–434.

Křetínská, M., & Staňková, M. (2021). Evaluation of the Construction Sector: a Data Envelopment Analysis Approach. In Mathematical Methods in Economics 2021: Conference Proceedings. Praha: Česká zemědělská univerzita v Praze, 287-292.

Kubicová, K., & Blašková, V. (2021). The Perception of Well-Being in European Countries. Advances in Business-Related Scientific Research Journal, 12 (2), 69-86.

Mirmozaffari, M. et al. (2022). An integrated artificial intelligence model for efficiency assessment in pharmaceutical companies during the COVID-19 pandemic. Sustainable Operations and Computers, 3, 156–167.

Nazarko, J., & Chodakowska, E. (2015). Measuring Productivity of Construction Industry in Europe with Data Envelopment Analysis. Procedia Engineering, 122, 204–212.

Nazarko, J., & Chodakowska, E. (2017). Labour efficiency in construction industry in Europe based on frontier methods: data envelopment analysis and stochastic frontier analysis. Journal of Civil Engineering and Management, 6, 787–795.

Nchor, D. Kolman, P., Střelec, L. & Darkwah, S A. (2015). The New Oil Sector and the Dutch Disease: the Case of Ghana. Acta Universitatis agriculturae et silviculturae Mendelianae Brunensis, 63 (6), 2035–2041.

Odeck, J., & Brathen, S. (2012). A meta-analysis of DEA and SFA studies of the technical efficiency of seaports: A comparison of fixed and random-effects regression models. Transportation Research Part A: Policy and Practice, 46 (10), 1574–1585.

Park, E., Kim, W., & Kim, S. (2022). How does COVID-19 differ from previous crises? A comparative study of health-related crisis research in the tourism and hospitality context. International Journal of Hospitality Management, 103, 103199.

Roubalová, L., & Viskotová, L. (2019). The Time Augmented Cobb-Douglas Production Function. Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis, 67 (5), 1347–1356.

Seow, C.S., Lomanto, D., & Ooi, L.L. (2022). COVID-19 and the impact on surgical training and education in Singapore. Heliyon, 8 (1), e08731.

Soundararajan, V. (2019). Heterogeneous effects of imperfectly enforced minimum wages in low-wage labor markets. Journal of Development Economics, 140, 355–374.

Staňková, M., & Hampel, D. (2019). Efficiency of the Building Project Sector in the Czech Republic – Stochastic Frontier Analysis Approach. In International Conference of Numerical Analysis and Applied Mathematics (ICNAAM 2018), Melville: American Institute of Physics (AIP), 2116(1), 400007.

Staňková, M., & Hampel, D. (2021). On the influence of model setting on stochastic frontier analysis. Mathematical Methods in the Applied Sciences, 44(1), 274–283.

Stehlík, M. et al. (2023). Stochastic approach to heterogeneity in short-time announcement effects on the Chilean stock market indexes within 2016-2019. Stochastic Analysis and Applications.

Testa, F., Iradlo, F., & Frey, M. (2011). The effect of environmental regulation on firms' competitive performance: The case of the building & construction sector in some EU regions. Journal of Environmental Management, 92 (9), 2136–2144.

Varvařovská, V. & Staňková, M., (2021), Does the Involvement of "Green Energy" Increase the Productivity of Companies in the Production of the Electricity Sector?, European journal of business science and technology, 7(2), 152–164.

Yellen, J. (1984). Efficiency Wage Models of Unemployment. The American Economic Review, 74, 200–205.

Yin, Z., Jiang, X., Lin, S., & Liu, J. (2022). The impact of online education on carbon emissions in the context of the COVID-19 pandemic – Taking Chinese universities as examples. Applied Energy, 314,118875.

Zámková, M., Střelec, L., Prokop, M., & Stolín, R. (2021). Flight Delay Causes at Selected Visegrad Group International Airports. European journal of business science and technology, 7 (1), 91–108.

Zhang, C. et al. (2022). An overview of the waste hierarchy framework for analyzing the circularity in construction and demolition waste management in Europe. Science of The Total Environment, 803, 149892.

Zhang, H., Chang, Q., Li, A., & Huang, J.D. (2022). Determining the Efficiency of the Sponge City Construction Pilots in China Based on the DEA-Malmquist Model. International Journal of Environmental Research and Public Health, 19 (18), 11195.

Zubizarreta, M. et al. (2017). Innovation evaluation model for macro-construction sector companies: A study in Spain. Evaluation and Program Planning, 61, 22–37.

DIGITAL WALLET ADOPTION: WORLDCOIN'S IMPACT ON FINANCIAL TECHNOLOGY

Tanpat Kraiwanit*
Rangsit University, Thailand

Pongsakorn Limna
Rangsit University, Thailand

Peerapat Wattanasin
Rangsit University, Thailand

Papon Moolngearn
Rangsit University, Thailand

Atipon Satranarakun
Rangsit University, Thailand

Abstract

This study investigates the adoption of digital wallet technology, particularly Worldcoin, in Thailand's fintech sector. Qualitative research involving interviews was conducted with 10 digital wallet experts, revealing significant adoption factors like convenience, security, and trust. Digital wallets provide benefits such as simplified payment processes, reduced complexity, increased accessibility, cost savings, and improved financial management. However, newcomers like Worldcoin face challenges, including user scepticism, trust issues, the need to attain critical mass, and uncertainties related to cryptocurrency regulations. These digital wallets have a profound impact on the fintech industry, driving competition and innovation and expanding financial inclusion. Nevertheless, strict adherence to regulatory requirements is crucial. Worldcoin and similar digital wallets possess the potential to revolutionise the fintech landscape by offering convenience and benefits while also presenting challenges to the industry and businesses. Success hinges on addressing user needs, ensuring robust security measures, complying with regulations, and fostering trust and innovation.

Key Words

Adoption; digital wallet; Worldcoin; financial technology

*Corresponding Author

INTRODUCTION

The world is witnessing a wave of innovative technologies that are reshaping various aspects of society. With the widespread availability of internet connectivity and smartphone-enabled services, people from diverse backgrounds now have easier access to high-speed technological advancements. Industry 4.0 represents a significant transformation in the global economy and society, driven by technological advancements that are revolutionising both internal and external application models, fostering enhanced digital interactions (Abdelmajied, 2022; Limna & Kraiwanit, 2022; Mourtzis et al., 2022). Simultaneously, the economy is undergoing a shift towards new and emerging forms of consumption. This shift is a result of the convergence of technological, economic, and sociocultural factors, which are presently disrupting traditional modes of commercial exchange (Ertz & Boily, 2019; Javaid et al., 2022). Financial technology, commonly known as fintech, harnesses technology to design and provide financial products and services. Its impact is felt by financial institutions, regulators, customers, and merchants across various industries. The pervasive influence of digital technologies is challenging the core principles of the heavily regulated financial sector, leading to the rise of alternative payment systems, peer-to-peer (P2P) money exchanges, and increased volatility in currency markets. Furthermore, fintech is fundamentally transforming the perception, development, promotion, delivery, and consumption of financial services (Carbó-Valverde et al., 2021; Limna & Kraiwanit, 2022; Siri & Kraiwanit, 2023).

Digital wallets have emerged as a disruptive force in the realm of financial technology, revolutionising the way in which people conduct transactions and manage their finances (Haddad & Hornuf, 2019; Palmié et al., 2020). One such digital wallet that is making waves in the industry is Worldcoin. On 8 May 2023, Worldcoin, a cryptocurrency initiative co-founded by Sam Altman, a co-founder and CEO of ChatGPT creator OpenAI, unveiled its cryptocurrency wallet. The newly released wallet, named "World App", includes support for a beta edition of Worldcoin along with various third-party cryptocurrencies, like Wrapped Ethereum (WETH), Wrapped Bitcoin (WBTC), USD Coin (USDC), and Maker's DAI stablecoin (DAI). The main driving factor behind the creation of Worldcoin was the desire to establish a cryptocurrency that could easily be used by people all over the world. To achieve this goal, Worldcoin has taken advantage of iris scanning technology for user identification, allowing users to access its global currency freely (Dalton, 2023; Dotson, 2023). Digital wallets include technologies that aim to make it easier to store, manage, and carry out transactions using currencies within the digital economy. These wallets provide effective alternatives to payment methods, offering accessibility, convenience, and enhanced security. Understanding the elements that affect the adoption and usage of wallets has become more and more important as their popularity has continued to rise (Agarwal et al., 2020; Ilieva et al., 2023). Because of its advanced features and potential to disrupt the

financial technology sector, Worldcoin has emerged as a competitor in the wallet industry. Worldcoin's offerings aim to change the way in which people interact with currencies and to shape the future of financial transactions (Guo & Renaldi, 2022; Kessler, 2023; Torpey, 2023).

Numerous studies have explored digital wallets. For instance, Liébana-Cabanillas et al. (2020) analysed the intention to use the Apple Pay mobile payment system using structural equation modelling. Furthermore, George and Sunny (2022) employed partial least squares structural equation modelling to integrate elements from the technology acceptance model (TAM) and the information systems (IS) success model, along with promotional offers and situational influence, to explain continued usage intentions towards mobile wallets. Nevertheless, there remains a scarcity of research dedicated to the adoption of digital wallets, particularly with a specific emphasis on Worldcoin. As previously highlighted, Worldcoin has risen as a prominent player in the realm of wallet technologies. Worldcoin's offerings are meticulously crafted to transform individuals' interactions with currencies and exert a profound influence on the future of financial transactions. Consequently, digital wallet adoption, with a specific focus on Worldcoin, emerges as an imperative and highly relevant subject of inquiry. Furthermore, in recent years, the fintech industry has witnessed the rapid rise of digital wallets, with Worldcoin emerging as a prominent player. While these digital wallets offer the promise of convenience, security, and financial innovation, their adoption faces several challenges and uncertainties. User scepticism, regulatory complexities, trust issues, and the need to attain critical mass are among the key issues that have surfaced. This study aims to explore the adoption of wallets, specifically focusing on Worldcoin. Its purpose is to understand the factors that influence individuals' decision to adopt this technology. Additionally, the study seeks to gain insights into the way in which Worldcoin is transforming the financial technology landscape and its impact on individuals and businesses. Accordingly, a thorough analysis of the adoption process will be conducted, along with an evaluation of the benefits, challenges, and user experiences associated with Worldcoin as a financial technology solution. The findings from this research can provide guidance for shaping user behaviour, informing business strategies, fostering innovations, and contributing to regulatory considerations in the financial technology industry. Ultimately, this study aims to contribute to creating an adaptable ecosystem that enables wallets, like Worldcoin, to thrive for both individuals and enterprises.

LITERATURE REVIEW

Digital wallets have become a catalyst in the technology (fintech) industry, bringing about significant changes in the way in which individuals, businesses, and even governments carry out financial transactions. These software-powered platforms, also known as wallets or e-wallets, serve as central hubs for various payment methods, such as credit cards, debit cards, and cryptocurrencies. Digital wallets offer users access to a range of

financial services, including investment management and participation, in decentralised finance (DeFi) ecosystems. The growing popularity of digital wallets can be attributed to the increasing digitisation of financial services and the growing reliance on mobile devices for daily tasks (Kumari & Devi, 2022; Ilieva et al., 2023; Kagan et al., 2023).

Determinants of Digital Wallet Adoption

In recent years, digital wallets have experienced a remarkable global surge in their adoption, fundamentally altering the way in which individuals manage their financial affairs and interact with digital ecosystems. The onset of the COVID-19 pandemic further accelerated this adoption as consumers sought secure and more hygienic payment alternatives (Maynard, 2021; Sutticherchart & Rakthin, 2023; Wei et al., 2023). According to Feng et al. (2022) and Gayá (2022), pivotal trends have materialised, driven by a confluence of factors, including the widespread availability of smartphones, a burgeoning appetite for convenient and contactless payment solutions, and the rapid expansion of online commerce. Esteemed providers of digital wallets, like Apple Pay, Google Pay, and PayPal, have assumed a prominent presence in households worldwide, while the advent of cryptocurrencies, such as Bitcoin, has catalysed the development of blockchain-based wallet solutions. These trends underscore a broader societal shift towards a cashless paradigm, in which digital wallets do not merely act as instruments for transactions but also serve as tools for personal financial management and investment and facilitators of cross-border financial activities (Mirchandani et al., 2020; Zema, 2022).

Understanding the adoption and impact of digital wallets, exemplified here by Worldcoin, has become paramount in comprehending the evolving dynamics of the financial technology industry, both on a global scale and within specific regions, like Thailand. As reported by Pymnts (2023), Worldcoin has introduced a new digital wallet called the World App, aimed at enhancing access to digital identity and global financial services. This wallet is specifically tailored to the Worldcoin ecosystem and serves various purposes, such as authenticating with World ID, acquiring Worldcoin tokens, and facilitating digital money transfers globally. Unlike many other crypto wallets, World App prioritises simplicity and user-friendliness by concentrating on key functionalities for Worldcoin and Ethereum, ensuring that it is accessible to a wide range of users. In addition to website and mobile app authentication via World ID, eligible individuals in certain countries can claim Worldcoin Grants using this wallet. Users can conveniently store and send digital currency as well as gaining insights into and trading select tokens through the World App. According to Okorie (2023), World ID serves as a unique authentication system, allowing users to verify their identity while maintaining their anonymity, thus enabling private digital identity. Worldcoin's World App is now globally accessible in its initial phase after extensive development and limited beta testing in select countries. Worldcoin aims to integrate artificial intelligence (AI) into the app, emphasising the concept of proof of personhood (PoP) as it seeks to

facilitate fair global distribution of digital currencies and pave the way for AI-funded Universal Basic Income (UBI). Unlike many other cryptocurrency platforms, the World App does not support every token or crypto functionality. Instead, it is tailored to focus on key features of Worldcoin and Ethereum. The app's user journey starts with registration and authentication via World ID, followed by verification through an Orb, and it enables users to sign in to websites, mobile apps, and crypto decentralised applications. Notably, the app does not require users to divulge personal information, like their name and email address, during the onboarding process, preserving their privacy.

The Advantages of Digital Wallets

Digital wallets, often known as mobile wallets or e-wallets, have gained widespread popularity due to their unmatched convenience. These platforms enable users to access their payment methods and financial resources effortlessly through their smartphones, simplifying transactions and personal finance management (Julião et al., 2023; Kagan et al., 2023). In addition to convenience, digital wallets excel in efficiency, allowing quick and uncomplicated transactions and reducing wait times at checkout. Security is a top priority, with advanced encryption techniques and biometric authentication enhancing the protection against data breaches. These wallets also support contactless payments, aligning with current hygiene practices. Digital wallets furthermore offer tools for financial organisations, such as storing digital receipts and providing transaction histories. They integrate seamlessly with loyalty programmes, offering exclusive benefits and discounts. Moreover, they simplify cross-border payments, with better exchange rates and lower fees than traditional banking. Digital wallets also contribute to ecological sustainability by reducing the need for physical payment cards and cash. These wallets promote financial inclusion, making digital payments accessible to those without traditional banking services. Their user-friendly design accommodates various technological proficiencies, and they integrate smoothly with other applications (Fareed, 2023; Frąckiewicz, 2023; Ilieva et al., 2023; Putrevu & Mertzanis, 2023).

The Obstacles of Digital Wallets

In addition to their advantages, digital wallets also involve various obstacles and challenges. Security concerns, including vulnerability to hacking and phishing, top the list of obstacles that users face when entrusting their personal and financial data to digital wallets (Chuhan & Wojnas, 2023; Kagan et al., 2023). The absence of industry-wide standardisation adds to the complexity, with different technologies and security measures employed by various providers, leaving users, businesses, and developers with a maze of options. The limited acceptance of digital wallet payments by businesses and users' hesitancy to embrace them for everyday transactions create adoption barriers. Compatibility issues further frustrate users as certain digital wallets are confined to specific devices or operating systems.

Reliance on a stable internet connection and smartphone battery life also pose challenges, making digital wallets inaccessible in areas with poor connectivity and during low battery states. Transaction fees, especially for minor transactions, deter users, while privacy concerns arise from data collection and analysis, further complicated by evolving regulatory landscapes. Complex user interfaces deter less tech-savvy individuals, and heavy reliance on one wallet can result in vendor lock-in, making it cumbersome to switch to an alternative provider. Despite these formidable challenges, the digital wallet industry is in a state of constant evolution, with providers actively addressing security and usability concerns. As technology advances and regulatory frameworks mature, the prospects for mitigating these obstacles and promoting wider adoption of digital wallets appear promising (Abdulrahaman et al., 2018; Bosamia & Patel, 2019; Uloli et al., 2020; Mew & Millan, 2021).

The Impact of Digital Wallets

Digital wallets have completely altered the way in which people manage their money and conduct business in the financial sector. The adoption of digital wallets has exerted a significant impact on the fintech sector, fostering innovation, driving market growth, and encouraging partnerships and collaborations. It has also promoted financial inclusion and advanced security technologies within the sector (Finance Magnates, 2023; Wulandari et al., 2023). For individuals and businesses, digital wallets offer unmatched convenience, cost savings, global transaction capabilities, valuable data insights, and increased security awareness. They have reduced the need for cash handling, especially benefiting small businesses, and prompted broader acceptance. As digital wallets continue to evolve, their influence on the financial landscape is expected to expand, shaping the way in which people transact, manage their finances, and interact with the broader fintech ecosystem (Afjal, 2023; Kagan et al., 2023). Similarly, as evidenced by reports in Finance Magnates (2023), digital wallets have transformed traditional banking and financial institutions by reshaping client expectations with their accessibility, security, and convenience. To stay relevant and competitive, these institutions must invest in digital technology, enhance security measures, prioritise customer experience, utilise data analytics, explore collaborations, and educate clients about digital wallets. Embracing these changes is crucial for navigating the evolving financial landscape.

Related Research

The intention to use a digital wallet has become increasingly prevalent in today's digital age. As technology continues to advance and reshape the way in which people conduct financial transactions, individuals are increasingly inclined to embrace the convenience and efficiency that digital wallets offer. Seetharaman et al. (2017) emphasised that perceived usefulness and transaction security exert a significant influence on behavioural intention, whereas innovativeness, critical mass, and the

absence of alternative options wield a strong impact on behavioural intention. Finally, flexibility exhibits a moderate influence on the intention to use a mobile wallet in Singapore.

Soodan and Rana (2020) found that hedonic motivation, perceived security, general privacy, facilitating conditions, performance expectancy, perceived savings, social influence, and price value, in this sequence, influence the intention to adopt e-wallets. Habit and effort expectancy were identified as obstacles with a detrimental effect on e-wallet adoption. Factors such as hedonic motivation, security, and privacy play more significant roles. To enhance adoption, service providers need to prioritise the maintenance of user privacy and security while also captivating customers through adjustments to the existing service offerings and features.

Daragmeh et al. (2021) discovered that, while the COVID-19 pandemic had a significant impact on the adoption of e-wallets, the key determinant influencing their sustained usage is consumer self-efficacy. This study holds implications for both the short and the long term. In the short term, decision makers should leverage health threat constructs as they played a role in motivating consumers to adopt e-wallets during the pandemic. In the long term, banks should formulate strategies aimed at fostering consumer loyalty to e-wallets by assuring customers that these financial services deliver the expected value and benefits, ultimately enhancing their self-efficacy.

Yang et al. (2021) established that perceived usefulness, perceived ease of use, social influence, lifestyle compatibility, and perceived trust have a substantial positive impact on both the intention to use an e-wallet and the adoption of an e-wallet. This study also demonstrated that the intention to use an e-wallet mediates the relationships between these predictors and the adoption of an e-wallet. Furthermore, the age and gender of the respondents play a moderating role in the effect of lifestyle compatibility on the intention to use an e-wallet.

METHODOLOGY

The researchers adhered to a systematic and rigorous approach, involving several key steps, starting with the establishment of clear objectives and the formulation of relevant research questions.

Research Strategy

This study used a mostly qualitative research methodology. The adoption of digital wallet technology, as well as its potential effects on the financial technology industry in Thailand, were examined in depth through qualitative research because it allows this kind of investigation. Insights that are nuanced in nature can be uncovered through qualitative research, which also offers a comprehensive understanding of the phenomenon being studied (Khoa et al., 2023).

Data Collection

An in-depth interviewing process was used to gather the data for this study. The interviewing process was performed in June 2023. One-to-one discussions between the researcher and the participants are central to in-depth interviews, a widely used qualitative data collection technique. This approach was chosen because it can collect in-depth, context-specific data that are rich and detailed directly from users of digital wallets.

The current study implemented measures to ensure participant validity and protection to address ethical concerns. The surveys used in the study underwent a rigorous validation process that involved the expertise of three specialists with backgrounds in business and social science to increase the reliability of the data collection instruments. Strict protocols were established while adhering to ethical standards. These included explicitly excluding individuals below the age of 18 from participating in the study, thereby safeguarding the rights and well-being of vulnerable populations. The participants were provided with comprehensive information about the research objective, and a clear and unequivocal statement emphasised the voluntary nature of their participation and their right to withdraw from the study at any point should they choose to do so. These measures were implemented proactively to address potential ethical concerns and uphold the principles of participant rights, autonomy, and informed consent.

Sample and Sampling

The sample for this study consisted of 10 Thai individuals who have adopted digital wallets. According to Obilor (2023), purposive sampling is a non-probability sampling technique used in research, in which the researcher selectively chooses participants based on their judgement and expertise to align with the study's objectives. It relies on the researcher's discretion and is often used in qualitative research when in-depth insights into a specific phenomenon are needed rather than statistical generalisations. This method is especially useful for small and specific populations. Hence, purposeful sampling was used as a sampling method. In accordance with Jangjarat et al. (2023), a minimum of six interviews appears to be optimal for achieving data saturation in qualitative research. Thus, 10 Thai people who have adopted digital wallets were required to participate in the study. Participants who met the following three requirements were included: 1) participants had to be at least 18 years old as this is the legal age for performing financial transactions and using digital wallet services; 2) participants had to be Thai citizens residing in Thailand to ensure that their experiences were within the Thai context; and 3) participants had to have recent knowledge about and practical experience of using digital wallets. With the aid of these criteria, the participants were guaranteed to be sufficiently knowledgeable about the technology in question and capable of sharing insightful opinions on how it was adopted and used.

Data Analysis

To maintain a textual record of the conversations, every interview session underwent verbatim recording. The identified themes and patterns were analysed and interpreted in accordance with the study's objectives. This process necessitated the drawing of conclusions, making of inferences, and provision of comprehensive explanations for the research findings. The study's chosen qualitative research methodology, content analysis, aligns with this analytical endeavour. Content analysis is a technique that facilitates a comprehensive and objective exploration of specific phenomena, enabling the derivation of reliable conclusions from a variety of data sources, whether they manifest as verbal, visual, or written content (Siripipatthanakul et al., 2022). To enhance the thoroughness and scope of the data analysis, the NVivo software was employed. This software tool holds a reputable position in qualitative research due to its effectiveness in managing and analysing qualitative data, as affirmed by Mortelmans (2019). NVivo streamlined the systematic coding of data, cross-referencing of information, and identification of significant trends within the dataset. The combination of the content analysis methodology with the NVivo software equipped the research team to conduct a comprehensive analysis and interpretation of the extensive data gathered from the in-depth interviews. This method played a pivotal role in delivering an insightful analysis and a nuanced understanding of the subject of the study, ultimately enhancing the study's credibility and depth.

RESULTS

Table 1 displays the information on the respondents as well as the date and time of the interviews. The sample consisted of 10 individuals living in Thailand with recent knowledge and practical experience of using digital wallets. The sample consisted of five males and five females with ages ranging from 22 to 34.

Table 1. Demographic information on the respondents and interview dates and times

Respondent	Gender	Age	Date and Time of Interview
1	Male	31	11 June 2023 at 09:00 a.m.
2	Male	22	11 June 2023 at 10:00 a.m.
3	Male	26	11 June 2023 at 11:00 a.m.
4	Male	28	12 June 2023 at 10:00 a.m.
5	Male	32	12 June 2023 at 11:00 a.m.
6	Female	29	12 June 2023 at 01:00 p.m.
7	Female	34	13 June 2023 at 09:00 a.m.

8	Female	32	13 June 2023 at 10:00 a.m.
9	Female	27	13 June 2023 at 11:00 a.m.
10	Female	33	13 June 2023 at 01:00 p.m.

In the analysis of interview data, the NVivo software was employed in combination with content analysis. After conducting a thorough examination of the participant responses, several significant themes emerged regarding the adoption of digital wallet technology. These themes encompass various critical aspects, including the factors influencing adoption, perceived benefits, challenges faced, impacts on the fintech sector, and broader implications for individuals and businesses, as shown in Figure 1.

Figure 1. Mind map
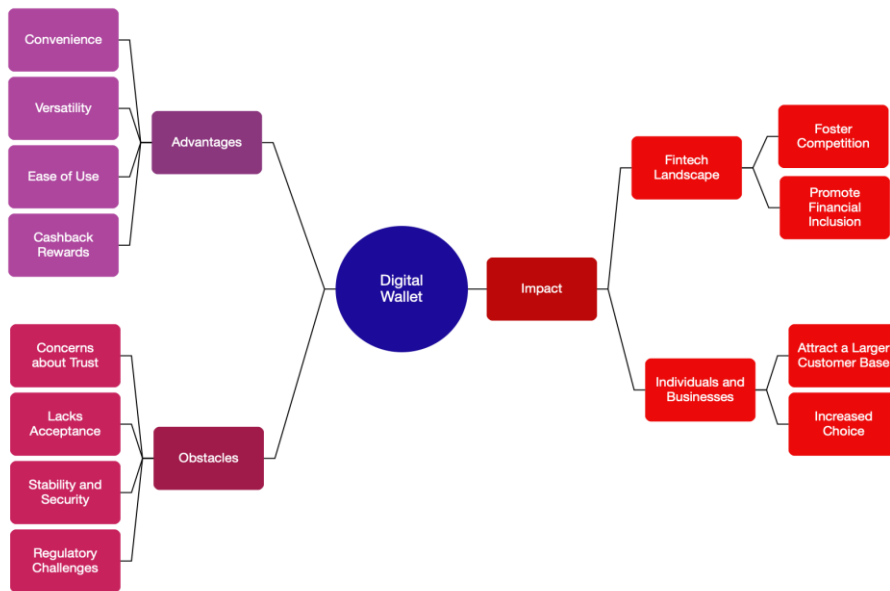
Source: Own survey.

Figure 2 presents the results visually in the form of a word cloud, showcasing the words used most frequently during the interviews. This visualisation was generated using a word frequency query to enhance the result clarity.

Figure 2. Word cloud

Source: Own survey.

Determinants of Adoption

The adoption of digital wallets like Worldcoin hinges on several critical factors, with convenience, security, and trust being paramount among them. Users seek digital wallets that offer a seamless and user-friendly experience, ensuring easy setup and accessibility across various devices. Swift transaction processing enhances the convenience by minimising wait times. Security is a fundamental concern, demanding robust data encryption, advanced authentication methods, and effective fraud protection measures to safeguard users' sensitive information and transactions. Equally significant is trust, heavily influenced by the reputation of the company offering the wallet, positive user reviews, and adherence to regulatory standards as users are more inclined to embrace digital wallets that they perceive to be reliable and secure. These factors collectively shape the decision-making process when individuals consider adopting digital wallets in their financial lives.

> Convenience is a significant factor for me. I've been using several digital wallets, and sometimes some of them are just too complicated for me. If Worldcoin can make the app more convenient and user-friendly, I believe many people, including me, will certainly use it. (Respondent 1)

> I've read some stories about digital wallets getting hacked, so security was a concern for me as well. You know, the idea of losing my hard-earned money or personal information to hackers is pretty scary. If Worldcoin can enhance the app's security, like incorporating advanced encryption and robust authentication methods, I believe many people will certainly use it. It would give users peace of mind knowing their funds and data are well-protected. (Respondent 2)

> Trust is essential too. I like to know that the company behind the wallet is reputable and follows the rules. If Worldcoin has a good reputation and is fully compliant with financial regulations, that would definitely be a pro for them. Plus, I'll also check user reviews before I start using it, just to get a sense of what the community thinks about their services. (Respondent 3)

Advantages

Digital wallets have gained recognition as a tool due to their versatility and ease of use. They simplify payment procedures by combining payment methods such as credit cards, debit cards, cryptocurrencies, and loyalty cards into a single user-friendly platform. One significant advantage of these wallets is that they eliminate the need for cash and traditional credit cards, promoting a more organised and uncluttered financial lifestyle. Digital wallets also offer the convenience of being accessible from any location with an

internet connection. This is especially useful for people who travel frequently or conduct numerous transactions. Furthermore, digital wallet users can benefit from a range of advantages, such as cashback rewards, discounts, and the ability to avoid currency conversion fees. These wallets also offer tools to enhance financial management skills by enabling users to track expenses and plan budgets effectively. Consequently, digital wallets serve as an asset for individuals seeking to enhance their financial planning abilities.

> Digital wallets, like Worldcoin, offer a way to bring together payment methods, such as credit cards, debit cards, cryptocurrencies and loyalty cards, all in one place. This lets users make payments and transactions quickly and efficiently. (Respondent 1)

> People can easily use their wallets to start transactions on devices like smartphones or tablets from anywhere with an internet connection. This level of convenience is particularly advantageous for travellers and people involved in transactions. (Respondent 4)

> Digital wallets often come with benefits, like cashback rewards. Moreover, when utilising cryptocurrencies, for transactions users can bypass the costs associated with currency conversion fees. (Respondent 5)

> Digital wallets frequently provide transaction records, making it easier for users to monitor and manage their expenses. This feature is useful for those who are involved in financial planning. (Respondent 6)

Obstacles

Worldcoin, as a newcomer to the world of wallets and cryptocurrencies, may face scepticism and challenges when it comes to gaining trust. Building a reputation will be crucial but might prove difficult, potentially slowing down widespread user adoption and the growth of network effects. These challenges could become more pronounced if users see value or acceptance of the platform. Moreover, concerns about Worldcoin's stability and security might arise, especially if it relies on technologies. Users may have doubts about risks or attacks that could compromise its security. Additionally, like all cryptocurrencies, Worldcoin may encounter issues and uncertainties. These could lead to the enforcement of restrictions or taxation policies on cryptocurrency transactions, adding another layer of complexity to its adoption and usage.

> Because Worldcoin is relatively new to the world of wallets and cryptocurrencies, there may be some scepticism and concerns about trust. Users might choose to wait until there is a proven track record established before embracing it. (Respondent 2)

Establishing a number of users and creating network effects can pose hurdles for Worldcoin or any digital wallet. People might be hesitant to adopt Worldcoin if they believe its usefulness is limited or if it lacks acceptance among their friends, acquaintances, and businesses. (Respondent 4)

If Worldcoin were to depend on unproven technologies, especially considering the possibility of vulnerabilities or security risks, there might be concerns raised about the stability and security of the platform. (Respondent 7)

The use of digital wallets, including Worldcoin, can be influenced by regulatory challenges and uncertainties, including the possibility of restrictions or taxation policies on cryptocurrency transactions. (Respondent 8)

Impacts on the Fintech Landscape, Individuals, and Businesses

Should Worldcoin evolve into a digital wallet or cryptocurrency, it is poised to wield significant influence across the FinTech landscape, affecting users and businesses alike. The adoption of such a digital wallet could foster competition, promote financial inclusion, and usher in shifts in financial behaviours, security measures, and business approaches. However, it would also introduce regulatory complexities that industry players would need to address diligently to facilitate responsible and secure utilisation.

The emergence of Worldcoin as a digital wallet or cryptocurrency would heighten competition within the FinTech sector. Current digital wallet and cryptocurrency providers are expected to react by introducing innovations to safeguard their market presence. This heightened competition has the potential to drive improvements in user experience, features, and security. (Respondent 5)

Increased choice in digital wallets and cryptocurrencies would benefit users, potentially leading to more tailored solutions that align with their financial preferences and goals. If Worldcoin focuses on accessibility and user-friendliness, it may help to increase financial inclusion by providing easy access to digital financial services, particularly for those who do not have traditional banking access. For example, it may make cross-border transactions more affordable than traditional methods. This is especially useful for people who need to send or receive money internationally. (Respondent 6)

Businesses that accept Worldcoin and other digital wallets would benefit from providing customers with a variety of payment options, potentially attracting a larger customer base. (Respondent 9)

To remain competitive, businesses would need to adapt to evolving payment preferences and potentially integrate digital wallet payment options. Failure to do so could lead to a loss of customers to competitors that offer more convenient payment methods. (Respondent 10)

DISCUSSION

This qualitative study delved into the adoption of digital wallet technology, with a specific focus on Worldcoin, and examined its potential to disrupt and bring advantages to the fintech landscape in Thailand. The findings and discussion present a comprehensive view of the factors influencing adoption, the benefits for users and businesses, and the challenges and opportunities associated with this emerging technology.

Determinants of Adoption

The adoption of digital wallets like Worldcoin is influenced by several critical determinants, including convenience, security, and trust. Users prioritise a seamless and user-friendly experience, fast transaction processing, robust security measures, and trustworthiness in the digital wallets that they choose. These factors collectively shape their decision-making process. In alignment with Singh et al. (2017), who elucidated the dimensions of perception and preference, this study's findings highlight a positive relationship between consumers' perceptions and their preferences. Among the variables examined, ease of use, trust, adherence to social norms, attitude, and security emerged as the most influential factors determining individuals' preferences for mobile wallets. In addition, Moghavvemi et al. (2021) confirmed that Malaysian merchants were motivated to adopt mobile payment by factors such as the relative advantage of reducing payment processing time and fees, convenience, and enhanced payment security features. Hossain et al. (2022) established the importance of the link between students' trust and their intention to utilise an e-wallet application.

Advantages

The advantages of digital wallets, such as consolidation of payment methods, reduced clutter, accessibility, cost savings, and improved financial management, make them valuable tools for users. They streamline financial practices, especially for travellers and for international transactions, and offer various financial benefits. Consistent with the findings of Alam et al. (2021), e-wallets exhibit several strengths, including financial inclusion, accessibility, security, ease of integration with other accounts, efficient product and customer service management, and rapid implementation and administration, while also offering benefits, like the potential to enhance customer service and incorporate promotions and loyalty programmes into the overall customer experience.

Obstacles

In addition to the benefits, there are obstacles to overcome, particularly for newcomers like Worldcoin. Scepticism and trust issues may arise due to the lack of an established track record. Achieving critical mass in user adoption and addressing security concerns, especially when relying on new technologies, can be challenging. Regulatory uncertainties and challenges are also common in the cryptocurrency space. In line with the research conducted by Alam et al. (2021), e-wallets are associated with certain threats. These threats encompass issues such as susceptibility to virus attacks, the possibility of simultaneous use of multiple wallets by clients, and concerns about potentially imprudent spending behaviour among e-wallet users. According to Moghavvemi et al. (2021), factors like technological incompatibility, complexity, the cost of investment, and the absence of critical mass and knowledge serve as elements discouraging Malaysian merchants from adopting mobile wallets.

Impacts on the Fintech Landscape, Individuals, and Businesses

The impacts of such digital wallets on the fintech industry, individuals, and businesses are profound. Competition and innovation are likely to increase, benefiting users with more choices and tailored solutions. Financial inclusion could be promoted, but regulatory compliance remains a crucial aspect. Businesses that adapt to evolving payment preferences may gain a competitive edge, while those that fail to do so risk losing customers. Dai (2020) revealed that e-wallet services play a pivotal role in catalysing the growth of micro, small, and medium enterprises in Indonesia. Makina (2019) confirmed that mobile money, enabled by mobile technology, has emerged as the most successful innovation in expanding financial inclusion in Africa.

In essence, digital wallets, including Worldcoin, have the transformative potential to reshape the landscape of the fintech industry. They offer users unparalleled convenience and a myriad of advantages, yet they also present both opportunities and challenges for the broader financial sector and businesses. The ultimate success of these digital wallets is contingent upon their ability to address user needs adeptly, tackle security concerns robustly, and navigate complex regulatory mandates, all while cultivating trust and fostering innovation.

The contributions of this research extend beyond academic inquiry; they hold practical significance for enterprises operating in the digital wallet and fintech sectors. This study underscores the paramount importance of prioritising user education, fortifying security measures, ensuring regulatory compliance, and driving innovation in the development of digital wallet solutions. Furthermore, this research lays a foundation stone for future studies in this domain, paving the way for comprehensive examinations of digital wallet adoption, consumer behaviour, security practices, regulatory impacts, and the broader implications for businesses and society at large. It seeks to foster a deeper understanding of this evolving landscape and the

multifaceted dynamics that define the intersection of technology, finance, and user experience.

CONCLUSIONS

This research delved into the adoption of digital wallet technology, with Worldcoin as a focal point, and its potential implications for Thailand's financial technology sector. The study examined the factors shaping adoption, encompassing elements like convenience, security, and trust, while also spotlighting the advantages for individuals and businesses, such as streamlined financial operations and enhanced accessibility. It further recognised the challenges, including the necessity of establishing credibility and navigating regulatory complexities.

The research underscored the transformative potential of digital wallets, encompassing heightened competition and innovation, potential advantages in terms of financial inclusion, and the critical need for adaptability among businesses operating within the continually evolving fintech landscape. Ultimately, the adoption of digital wallets like Worldcoin holds the potential to exert a significant impact on Thailand's financial technology sector, and stakeholders must thoughtfully assess and adapt to the opportunities and challenges that they introduce.

Looking practically at this study, it underscores the paramount significance of user-centric elements such as convenience, security, and trust in the context of digital wallet adoption. It offers valuable insights for digital wallet providers and financial institutions, underscoring the pivotal role played by robust security measures, regulatory adherence, and user-friendly design in bolstering adoption rates. In a rapidly evolving fintech landscape, the study underscores the necessity for businesses to adapt by accommodating shifting payment preferences and contemplating the integration of digital wallet options.

On the academic front, this research lays a solid foundation for future investigations into digital wallet adoption. It creates opportunities for scholars to delve into aspects like consumer behaviour, security practices, regulatory repercussions, and the broader impacts on both businesses and society. It also paves the way for cross-cultural studies and in-depth examinations of the evolving dynamics within the digital wallet market.

In summary, this study stands as a valuable resource for industry stakeholders and academic researchers alike. It sheds light on the intricacies of digital wallet adoption and its potential to reshape the financial technology landscape. It underscores the necessity of striking a harmonious balance between convenience, security, and trust within the digital wallet ecosystem to propel widespread adoption and innovation.

However, it is important to acknowledge certain limitations of this study. These include a relatively small sample size and a potential lack of diversity among the respondents, suggesting the need for future research involving larger and more diverse participant groups. Additionally, the findings may be context specific, cautioning against broad extrapolations to other regions or

cultural contexts. Recommendations for future research involve exploring specific consumer demographics, examining the influence of cultural factors, and investigating regional disparities in the impact of digital wallet adoption on personal financial practices and behaviours. Furthermore, research efforts should focus on advanced security technologies within digital wallets aimed at enhancing user data and asset protection.

REFERENCES

Abdelmajied, F. Y. (2022). Industry 4.0 and its implications: Concept, opportunities, and future directions. In Supply Chain-Recent Advances and New Perspectives in the Industry 4.0 Era. IntechOpen. https://www.intechopen.com/chapters/80514

Abdulrahaman, M. D., Alhassan, J. K., Ojeniyi, J. A., & Abdulhamid, S. I. M. (2018). Security risk analysis and management in mobile wallet transaction: A case study of Pagatech Nigeria Limited. International Journal of Computer Network and Information Security, 10(12), 21–33. https://doi.org/10.5815/ijcnis.2018.12.03

Afjal, M. (2023). Bridging the financial divide: a bibliometric analysis on the role of digital financial services within FinTech in enhancing financial inclusion and economic development. Humanities and Social Sciences Communications, 10(1), 1–27. https://doi.org/10.1057/s41599-023-02086-y

Agarwal, S., Qian, W., Tan, R., Agarwal, S., Qian, W., & Tan, R. (2020). Financial inclusion and financial technology. In Household Finance: A Functional Approach, 307–346. https://doi.org/10.1007/978-981-15-5526-8_9

Alam, M. M., Awawdeh, A. E., & Muhamad, A. I. B. (2021). Using e-wallet for business process development: Challenges and prospects in Malaysia. Business Process Management Journal, 27(4), 1142–1162. https://doi.org/10.1108/BPMJ-11-2020-0528

Bosamia, M., & Patel, D. (2019). Wallet payments recent potential threats and vulnerabilities with its possible security measures. International Journal of Computer Sciences and Engineering, 7(1), 810–817. https://doi.org/10.26438/ijcse/v7i1.810817

Carbó-Valverde, S., Cuadros-Solas, P. J., & Rodríguez-Fernández, F. (2021). FinTech and banking: an evolving relationship. In King, T., Stentella Lopes, F.S., Srivastav, A., Williams, J. (Eds.) Disruptive Technology in Banking and Finance. Palgrave Studies in Financial Services Technology. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-81835-7_6

Chuhan, S., & Wojnas, V. (2023). Designing and evaluating a resident-centric digital wallet experience. In Moallem, A. (eds) HCI for Cybersecurity, Privacy and Trust. HCII 2023. Lecture Notes in Computer Science, vol 14045. Springer, Cham. https://doi.org/10.1007/978-3-031-35822-7_38

Dai, R. M. (2020). Fintech as a catalyst for growth of micro, small and medium enterprises in Indonesia. Academy of Strategic Management Journal, 19(5), 1–12. https://www.abacademies.org/articles/fintech-as-a-catalyst-for-growth-of-micro-small-and-medium-enterprises-in-indonesia-9583.html

Dalton, M. (2023). OpenAI CEO's Worldcoin project launches wallet app. Crypto Slate. https://cryptoslate.com/openai-ceos-worldcoin-project-launches-wallet-app

Daragmeh, A., Sági, J., & Zéman, Z. (2021). Continuous intention to use e-wallet in the context of the COVID-19 pandemic: Integrating the health belief model (HBM) and technology continuous theory (TCT). Journal of Open Innovation: Technology, Market, and Complexity, 7(2), 132. https://doi.org/10.3390/joitmc7020132

Dotson, K. (2023). Report: OpenAI CEO Sam Altman in talks to raise $100M for Worldcoin crypto startup. SiliconAngle.

Ertz, M., & Boily, É. (2019). The rise of the digital economy: Thoughts on blockchain technology and cryptocurrencies for the collaborative economy. International Journal of Innovation Studies, 3(4), 84–93. https://doi.org/10.1016/j.ijis.2019.12.002

Fareed, T. (2023). A systemic review of payment technologies with a special focus on digital wallets. In Turi, A.N. (eds) Financial Technologies and DeFi. Financial Innovation and Technology. Springer, Cham. https://doi.org/10.1007/978-3-031-17998-3_6

Feng, H., Houghton, L., Foo, E., Tjondronegoro, D., & Zobair, K. M. (2022). The rise of mobile payments in the Asia Pacific: Opportunities, risks and challenges. Griffith University. http://hdl.handle.net/10072/412364

Finance Magnates. (2023, May 23). The impact of digital wallets on traditional banking and financial institutions. Finance Magnates. https://www.financemagnates.com/fintech/education-centre/the-impact-of-digital-wallets-on-traditional-banking-and-financial-institutions

Frąckiewicz, M. (2023, June 17). A deep dive into the security features of digital wallets. TS2. https://ts2.space/en/a-deep-dive-into-the-security-features-of-digital-wallets

Gayá, R. (2022). The payment landscape of B2C e-commerce marketplaces in Latin America and the Caribbean. Production Development Series, N° 230 (LC/TS.2022/167), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2022. https://econpapers.repec.org/paper/ecrcol026/48557.htm

George, A., & Sunny, P. (2022). Why do people continue using mobile wallets? An empirical analysis amid COVID-19 pandemic. Journal of Financial Services Marketing, 1–15. https://doi.org/10.1057/s41264-022-00174-9

Guo, E., & Renaldi, A. (2022). Deception, exploited workers, and cash handouts: How Worldcoin recruited its first half a million test users. MIT Technology Review. https://www.technologyreview.com/2022/04/06/1048981/worldcoin-cryptocurrency-biometrics-web3

Haddad, C., & Hornuf, L. (2019). The emergence of the global fintech market: Economic and technological determinants. Small Business Economics, 53(1), 81–105. https://doi.org/10.1007/s11187-018-9991-x

Hossain, M. M., Akter, S., & Adnan, H. M. (2022). Does the trust issue impact the intention to use e-wallet technology among students?. Journal of Entrepreneurship and Business, 10(1), 57–71. https://doi.org/10.17687/jeb.v10i1.860

Ilieva, G., Yankova, T., Dzhabarova, Y., Ruseva, M., Angelov, D., & Klisarova-Belcheva, S. (2023). Customer attitude toward digital wallet services. Systems, 11(4), 185. https://doi.org/10.3390/systems11040185

Jangjarat, K., Kraiwanit, T., Limna, P., & Sonsuphap, R. (2023). Public perceptions towards ChatGPT a s the Robo-Assistant. Online Journal of Communication and Media Technologies, 13(3), e202338. https://doi.org/10.30935/ojcmt/13366

Javaid, M., Haleem, A., Singh, R. P., Suman, R., & Gonzalez, E. S. (2022). Understanding the adoption of industry 4.0 technologies in improving environmental sustainability. Sustainable Operations and Computers, 3, 203–217. https://doi.org/10.1016/j.susoc.2022.01.008

Julião, J., Ayllon, T., Gaspar, M. (2023). Financial inclusion through digital banking: The case of Peru. In Machado, J., et al. Innovations in Industrial Engineering II. icieng 2022. Lecture Notes in Mechanical Engineering. Springer, Cham. https://doi.org/10.1007/978-3-031-09360-9_24

Kagan, J., Khartit, K., & Ma. J. (2023, March 17). What is a digital wallet? Investopedia. https://www.investopedia.com/terms/d/digital-wallet.asp p.

Kessler, S. (2023). Sam Altman's crypto project, Worldcoin, releases first major consumer product. CoinDesk.

Khoa, B. T., Hung, B. P., & Hejsalem-Brahmi, M. (2023). Qualitative research in social sciences: data collection, data analysis and report writing. International Journal of Public Sector Performance Management, 12(1-2), 187–209.

Kagan, J., Khartit, K., & Ma, J. (2023, March 17). What is a digital Wallet?. Investopedia. https://www.investopedia.com/terms/d/digital-wallet.asp.

Kumari, A., & Devi, N. C. (2022). The impact of fintech and blockchain technologies on banking and financial services. Technology Innovation Management Review, 12(1/2), 22010204. http://doi.org/10.22215/timreview/1481

Liébana-Cabanillas, F., García-Maroto, I., Muñoz-Leiva, F., & Ramos-de-Luna, I. (2020). Mobile payment adoption in the age of digital transformation: The case of Apple Pay. Sustainability, 12(13), 5443. https://doi.org/10.3390/su12135443

Limna, P., & Kraiwanit, T. (2022). The rise of fintech: A review article. STOU Academic Journal of Research and Innovation (Humanities and Social Science), 2(2), 35-46. https://so04.tci-thaijo.org/index.php/InnovationStou/article/view/260155

Makina, D. (2019). The potential of FinTech in enabling financial inclusion. In Extending Financial Inclusion in Africa (pp. 299–318). Academic Press. https://doi.org/10.1016/B978-0-12-814164-9.00014-1

Maynard, N. (2021, February 16). Digital wallets adoption driven by COVID-19 pandemic. Juniper Research. https://www.juniperresearch.com/resources/analystxpress/february-2021/digital-wallets-adoption-driven-by-covid-19-pandem

Mew, J., & Millan, E. (2021). Mobile wallets: Key drivers and deterrents of consumers' intention to adopt. The International Review of Retail, Distribution and Consumer Research, 31(2), 182–210. https://doi.org/10.1080/09593969.2021.1879208

Mirchandani, A., Gupta, N., & Ndiweni, E. (2020). Understanding the fintech wave: A search for a theoretical explanation. International Journal of Economics and Financial Issues, 10(5), 331–343. https://ideas.repec.org/a/eco/journl/2020-05-37.html

Moghavvemi, S., Mei, T. X., Phoong, S. W., & Phoong, S. Y. (2021). Drivers and barriers of mobile payment adoption: Malaysian merchants' perspective. Journal of Retailing and Consumer Services, 59, 102364. https://doi.org/10.1016/j.jretconser.2020.102364

Mortelmans, D. (2019). Analyzing qualitative data using NVivo. In The Palgrave Handbook of Methods for Media Policy Research (pp. 435–450). Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-16065-4_25

Mourtzis, D., Angelopoulos, J., & Panopoulos, N. (2022). A literature review of the challenges and opportunities of the transition from industry 4.0 to society 5.0. Energies, 15(17), 6276. https://doi.org/10.3390/en15176276

Obilor, E. I. (2023). Convenience and purposive sampling techniques: Are they the same. International Journal of Innovative Social & Science Education Research, 11(1), 1–7. https://seahipaj.org/journals-ci/mar-2023/IJISSER/full/IJISSER-M-1-2023.pdf

Okorie, I. J. (2023, May 17). Worldcoin launches its ecosystem wallet, World App. Crypto Tvplus. https://cryptotvplus.com/2023/05/worldcoin-launches-its-ecosystem-wallet-world-app/

Palmié, M., Wincent, J., Parida, V., & Caglar, U. (2020). The evolution of the financial technology ecosystem: An introduction and agenda for future research on disruptive innovations in ecosystems. Technological Forecasting and Social Change, 151, 119779. https://doi.org/10.1016/j.techfore.2019.119779

Putrevu, J., & Mertzanis, C. (2023). The adoption of digital payments in emerging economies: Challenges and policy responses. Digital Policy, Regulation and Governance. https://doi.org/10.1108/DPRG-06-2023-0077

Pymnts. (2023, May 8). Worldcoin launches digital wallet for identity and finance. Pymnts. https://www.pymnts.com/cryptocurrency/2023/worldcoin-launches-digital-wallet-for-identity-and-finance/

Seetharaman, A., Kumar, K. N., Palaniappan, S., & Weber, G. (2017). Factors influencing behavioural intention to use the mobile wallet in Singapore. Journal of Applied Economics and Business Research, 7(2), 116–136. http://www.aebrjournal.org/uploads/6/6/2/2/6622240/joaebrjune2017_116_136.pdf

Singh, N., Srivastava, S., & Sinha, N. (2017). Consumer preference and satisfaction of m-wallets: A study on North Indian consumers. International Journal of Bank Marketing, 35(6), 944–965. https://doi.org/10.1108/IJBM-06-2016-0086

Siri, P., & Kraiwanit, T. (2023). Knowledge and understanding of public P2P lending transactions in Bangkok and its vicinity, Thailand. In International Conference on E-Business, E-Commerce and Internet (pp. 44–48). https://ssrn.com/abstract=4413946

Siripipatthanakul, S., Jaipong, P., Limna, P., Sitthipon, T., Kaewpuang, P., & Sriboonruang, P. (2022). The impact of talent management on employee satisfaction and business performance in the digital economy: A qualitative study in Bangkok, Thailand. Advance Knowledge for Executives, 1(1), 1–17. https://ssrn.com/abstract=4157704

Soodan, V., & Rana, A. (2020). Modeling customers' intention to use e-wallet in a developing nation: Extending UTAUT2 with security, privacy and savings. Journal of Electronic Commerce in Organizations, 18(1), 89-114. https://doi.org/10.4018/JECO.2020010105.

Sutticherchart, J., & Rakthin, S. (2023). Determinants of digital wallet adoption and super app: A review and research model. Management & Marketing, 18(3), 270–289. https://doi.org/10.2478/mmcks-2023-0015

Torpey, K. (2023). OpenAI CEO's Worldcoin releases crypto wallet. Yahoo! Finance. https://finance.yahoo.com/news/openai-ceo-worldcoin-releases-crypto-024115042.html.

Uloli, T., Sadasivam, G. S., & Arthi, R. (2022). Requirements analysis of security and privacy of mobile payments-Indian context. International Journal of Mobile Communications, 20(6), 639–658. https://doi.org/10.1504/IJMC.2022.125923

Wei, Q., Xiao, W., Yaqub, R. M. S., Irfan, M., Murad, M., & Yaqub, M. Z. (2023). Adoption of digital money (e-wallet) in the post COVID-19 era: The moderating role of low distribution charges and low transit time in impulsive buying: A developing country perspective. Frontiers in Environmental Science, 10, 984316. https://doi.org/10.3389/fenvs.2022.984316

Wulandari, R., Susilowati, E., Safitri, N., & Ikhsan, M. (2023). A literature review on fintech innovations: Examining the evolution, impact, and challenges. SEIKO: Journal of Management & Business, 6(2), 438–448. https://journal.stieamkop.ac.id/index.php/seiko/article/view/5236

Yang, M., Mamun, A. A., Mohiuddin, M., Nawi, N. C., & Zainol, N. R. (2021). Cashless transactions: A study on intention and adoption of e-wallets. Sustainability, 13(2), 831. https://doi.org/10.3390/su13020831

DOUBLE TRANSLATION: A POST-COLONIAL APPRAISAL OF MANAGEMENT MODEL TRANSITION IN A MULTINATIONAL COMPANY NETWORK

Eren Onay*
Istanbul Technical University,
Turkey
erenonay@itu.edu.tr

Mehmet Erçek
Istanbul Technical University,
Turkey
ercekme@itu.edu.tr

Abstract

This study aims to explore how popular management techniques are implemented in firms and how management experts actively manipulate the interplay among multiple competing ideas. Building on trending and semantically related fashion research, we intend to center upon a case study in which one of the leading electronic manufacturers of the World strives to change its implementation focus from Six Sigma to Factory Improvement 11. Thus, we strive to emphasize not only the temporal transition and resistance patterns but also contextual (double) translations that occur in one of the overseas subsidiaries. The case provided us with ample evidence about how the initial resistance to essentialist global rhetoric triggered local translations based on locally enabled bricolage of ideas and practices. We found that experts located in the subsidiaries often enjoyed significant levels of autonomy to display agentic behavior in denouncing/renouncing/editing both symbolic and material components of managerial practices.

Key Words

Management fashions; management innovation; lean management; lean production; Toyota production system.

*Corresponding Author

INTRODUCTION

Many of the scholarly works that have been associated with the travels of management knowledge across countries have largely overlooked a refined treatment of power (Sturdy, 2009). This is not surprising because the theoretical frameworks of these studies are often derived from institutional theories of organization and/or sociology of translation, themselves are accused of being rather negligent about power (Sahlin and Wedlin,2008; Barley,1986).

To reinstate power back in transnational knowledge diffusion models, we hereby build on post-colonial theory (Bhabha, 1994), and specifically, a double translation framework, referring to the dialectic modes of local transformative sequences that a management idea undergoes during its travel in space and time. The double translation term has been borrowed from Mignolo and Schiwy (2003) to invoke dynamics of counter-translation and resistance that are engendered by local agencies. There is a significant number of previous studies, which attempt to incorporate a post-colonial approach to trans-national diffusion of management ideas (i.e., Banerjee and Prasad, 2008; Boussebaa and Morgan, 2014; Boussebaa et al., 2012; Frenkel, 2008; Jack and Westwood, 2006). Setting aside their theoretical contributions to the field by opening up a novel paradigmatic approach, most of these works were inconclusive in terms of complementing their frameworks with robust empirical evidence. Scholars of international business (IB) also tackled the trans-national transfer of management practices, usually regarding the transfers between the headquarter and the affiliates of multinational corporations (Bouquet and Birkinshaw, 2008; Ferner et al., 2012; Kostova and Roth, 2002; Sayım, 2010). Studies in IB tradition have also paid scarce attention to power relations until recently when several scholars have started to underscore the issues of conflict and power within the MNC networks (Dörrenbacher and Geppert, 2006; 2009; Dörrenbächer and Gammelgaard, 2011; Geppert et al., 2015). While this strand of research has produced remarkable outcomes in terms of directing attention to the micro-political processes of power within the networks of MNCs, it does not systematically explore the problems related to the transnational transfer of management practices.

On the other hand, those who persistently focus on the trans-national transfer of management ideas and/or practices, usually draw on the theory of fashions and the sociology of translation (Czarniawska and Joerges, 1996). Scholars of management fashions usually provided supply-side arguments about the alteration of fashions, in which gurus, consultants, and mass media play the leading role (Abrahamson, 1996). Even when these carriers radically transform, manipulate, and frame original ideas inherent in a fashionable management discourse (Erçek and İseri-Say, 2008; Sahlin and Wedlin, 2008), less attention has been paid to the demand side, that is, actors' role in the translation process. Few case studies provide us with interesting evidence about how managers and experts within fashion-consuming firms occasionally resist, selectively amplify, and repress its constitutive elements (Benders and Heusinkveld, 2012; Gond and

Boxenbaum, 2013; Heusinkveld et al., 2013). Nonetheless, lacking a systematic treatment of power, extant research in this stream fails to represent power relations properly, which underlie existing patterns of identities, schemata, and rules/resources.

Our study aims to contribute to the line of research that seeks to understand how popular management practices are implemented in firms and how management experts actively manipulate the interplay among several competing ideas. We focus on a case study in which one of the leading electronic manufacturers of the World strives to change its implementation focus from Six Sigma to Factory Improvement 11. In this way, we strive to emphasize not only the temporal transition and resistance patterns but also contextual (double) translations that occur in one of the overseas subsidiaries. Whereas the case provides us with ample evidence about an intentional initiative of company headquarters to create firmer control over company-specific knowledge assets and constrain generic skill development of its workers, it also offers us a lucrative setting to observe how country-level experts and managers selectively (double)translate the symbolic and material elements of the competing practice as either dualistic or complementary. The case further exemplifies how transculturation forces are opposed in some instances by local resistance and double-translation of local, emergent meanings, practices, and priorities.

The remainder of the paper will address theoretical discussions of its framework. Then, it will briefly discuss the methodological approach and details of the data. It will conclude with the presentation of the preliminary findings and theoretical contributions.

POWER, POST-COLONIAL TRADITION AND DOUBLE-TRANSLATION

The political character of management knowledge has been a central subject in critical management studies. Studies conducted in many diverse fields and settings have unraveled the hegemonic framing of organizational rules and systematic silencing of many organizational roles and identities (Clegg and Palmer, 1996). Yet, power has also been conceptualized positively; to be able to accomplish tasks, carry out activities, and create novel entities or abstract ideas. Alongside with 'power over' and 'power inside' types of categorizations, social theorists also developed frameworks to demarcate a 'power across' category (Gaventa and Cornwall, 2008). In this vein, the Foucauldian framework focuses on the relational aspects of power and tends to conceptualize it alongside with and inseparable from associated knowledge relations (Foucault, 1977). Vested in all social relations, Foucauldian power/knowledge operates by disciplinary discourses, reified by accompanying rules and practices of institutions, and brings subjects into existence (Townley, 1993).

Despite power's widespread use in critical and post-structural analyses of management and organizational studies, it has not been employed as a central concept or an analytical scheme in the research stream that focuses on the travel/translation of management ideas (Czarniawska and Sevon,

1996; 2005; Sahlin and Wedlin, 2008). The latter were generally inspired by organizational institutionalism, the sociology of translation, and the theory of fashions (Ansari at al., 2010). In this line of research, translation refers to a change/transformation process, whereby one or more focal entities get transformed during a travel in space and time. However, as O'Mahoney (2016) eloquently shows what gets transformed during the travel can be divergent: entities' state, content, meaning and interests can change. Moreover, it can be stipulated that the stream lacks a systematic focus on power because its meta-theoretical foundations are also quite apolitical (O'Mahoney, 2016).

Unlike the sociology of translation or organizational institutionalism, post-colonial theory retains its primary focus on both power relations and transnational knowledge appropriation simultaneously (Banarjee and Prasad, 2008). It differs from previous strands of thought by concentrating on various transnational knowledge transfer mechanisms through which the First World retains its superiority over the Third World and how various forms of resistance arise from such interaction over time (Ashcroft et al., 2007). Inspired by influential theorists such as Bhabha (1994a; 1994b), Said (1978; 1993), and Spivak (1988), the theory has often focused on ways by which subject positions such as the Colonizer and the Colonized are recursively constructed over time. Although, the tone of the theory comes closer to the post-structuralist representation of constructed subjectivities, and thereby, a mutually recursive relation between power and knowledge claims, it retains a critical room for reflexive agency on the part of the Colonized. In particular, Bhabha (1994b) elaborates on the intricate details of such agency through coinage of concepts like hybridity and mimicry. The latter concept refers to the enduring difference between the identities of the Colonizer and the Colonized, even when the Colonized successfully appropriates the Colonizer's cultural conventions and norms. It is so because the construction of the Colonized Other can never be complete according to Bhabha (1994b), formulated in the famous phrase: "It is almost the same but not quite." In this vein, national cultures are conceptualized as not essential, holistic, or fixed, but rather, represent narrative constructions that are continually reconstructed. Thus, even when different forms of mimicry (i.e., disciplinary, hegemonic, brutal) have been forced on the Colonized's culture, the outcome shall always be a hybrid one. Hybridity, in this sense, represents a liminal space, which cannot be reduced either to the original -Colonizer's- or the indigenous -Colonized's- system of beliefs, norms, and conventions. Being a blend of two cultures and having gained attributes that cannot be reduced to any, hybridity enables a reflexive capacity, by which the Colonizing discursive claims can be questioned and transformed. This critical capacity of the 'Third Space' stimulates creativity and potency for novel claims of knowledge, instigating the ongoing construction of the hybrid space.

While Bhabha's formulations are invaluable in terms of their contribution to the post-colonial understanding of the trans-national knowledge appropriation and frame how such appropriation mechanisms work, a more detailed microlens is needed to account for how Bhabhian frame is reified in

ongoing practices of (re)appropriation. At this point, we draw on a rather unnoticed concept of "double-translation" to anchor our theoretical frame firmly on the post-colonial discourse theory and capture the intricate details of the ongoing transformation of knowledge claims. Double-translation has been coined as a term to explain various modes of counter-translation and counter-enculturation activities that happen in post-colonial settings as resistance to oppressive, naturalizing, and all-encompassing Globalizing forces (Mignolo and Schiwy, 2003). In line with the Bhabhian frame, double-translation allows local actors to act in a critical reflexive fashion, especially when they are immersed within the recursive cycles of reconstruction spurred by novel external knowledge claims. In this way, symbolic and material constituents of the inflowing knowledge relations could be reframed as local bricolage, which reconfigures the old repertoire to make sense and renounce/redefine the new one. Consequently, double-translation does not necessarily end up in total enculturation of the local, nor does it conceptualize a dual opposite that perfectly counters and renounces the Colonial (Frenkel, 2008). Instead of a binary opposition, double translation logic advocates the hybrid, transformative, and blended mix of Global and local elements. It simply focuses on how and with which means locals can activate reflexive frames of mind to counter or transform naturalized rules, resources, and logics of the Global.

The latter logic aligns perfectly well with the recent research trends, which tend to represent MNCs at the intersection of a nested institutional order (Boussebaa and Morgan, 2014). According to the scholars, who study transnational fields or institutional order of the Global, MNCs have access to both local national institutional and the meta-institutional order located at the transnational level. Besides, as Delmestri and Brumana (2017) argue, simultaneous embeddedness in these two different institutional layers can instigate conflicting exposures for an MNC, which, in turn, spur continual tension between many internal and external actors over a multitude of resources, norms, and interests. It is such tension that stimulates a critical reflexive stance on the part of various actors in an MNC network to counter, nullify, denaturalize, and/or reconstruct infiltrating claims of management knowledge; and challenge, at least, some elements of the institutional order, within which they are embedded. In the following section, we try to outline the methodological approach that we have employed to uncover how actors engaged in the above-delineated types of actions in an MNC subsidiary located in Turkey.

DATA AND METHOD

The main research questions of this research are respectively how popular management discourses are disseminated within organizations, how management professionals actively manipulate the interplay among several competing management discourses, how country-level professionals and managers selectively (double) translate the symbolic and material elements of the competing practices and how transculturation forces are opposed in

some instances by local resistance and double-translation of local, emergent meanings, practices and priorities. In line with these research questions, we have employed a qualitative methodology to understand the contextual and agentic factors that affect the ongoing counter and/or double translations of globally circulating managerial discourses within the inter-firm network of a Multinational Company (MNC). For matters of secrecy, we keep the name of the multinational as anonymous, with an acronym of Electro. Electro is a Worldwide giant in electronics manufacturing products and its headquarters (HQ) reside in South Korea. We have been granted access to its operations in its HQ and specifically the subsidiary in Turkey regarding the implementation of the Factory Improvement System (FIS) and the Six Sigma (6S) initiative.

To better represent our case, we used participant observation and on-site interviews. One of the researchers, who was already an employee of the Turkish subsidiary, but working in a different division, was granted access to the related departments' activities both in Turkey and the HQ for four months. An observation protocol and a participant list were devised which was updated by the data-gathering process before participating in the activities of 6S and FIS. The participant list includes managers (mid-level & and executives), and professionals who have been involved in 6S and FIS implementations at HQ and Electro's affiliated companies. They were located in Turkey, India, Saudi Arabia, and Thailand. However, due to the inability to gather systematic ethnographic evidence from other sites, we concentrated our research effort on the Turkish subsidiary and made use of our data to triangulate our focal case. The interview protocol consists of 18 questions in total which aimed at analyzing four fundamental research questions. The former author travelled to the HQ and interviewed FIS and 6S experts from HQ and other subsidiaries to collect data.

The data for our case are composed of face-to-face interviews, corporate archives, mass media sources that are related to the relevant activities of the multinational, and on-site observations/field notes. In total 31 face-to-face interviews representing HQ and four different affiliated company sites were conducted. Each meeting took 1,5 hours on average. The whole process lasted approximately 11 months (data collection, data transformation, etc.). After getting permission of participants, all interviews were recorded both as audio and video to prevent data loss. After each meeting, all recordings were directly transformed and stored as text files both on a cloud platform and on two separate disks. After completing all interviews, we acquired all data which consisted of 52 pages and 26212 words. The different responses of all participants for the same questions were evaluated together in a separate report. All findings and results of qualitative research were analyzed according to this report.

For analyzing data, we used critical hermeneutical analysis to analyze the bulk of data gathered from the company archives and interviews with key informants. In this way, we were able to focus on how various actors legitimize FIS alongside with, and sometimes, as opposed to 6S; which particular power/knowledge relations are assumed by FIS and 6S; what kind of translations and double-translations occur in the local subsidiary and, by

which means ongoing translations iterate and evolve. Critical hermeneutics has been increasingly used in organization studies (i.e., Noorderhaven, 2004; Prasad, 2002), specifically in cases that are anchored in post-colonial theory (Gopinath and Prasad, 2013). The root of the hermeneutical analysis goes back to deciphering the meaning of historically situated texts, but with the works of recent philosophers like Hans-George Gadamer and Paul Ricoeur (Bleicher, 1980; Palmer, 1969), hermeneutics expanded its analytical focus from texts to various cultural symbols, sign systems and even to organizational practices (Gabriel, 1991; Gopinath and Prasad, 2013).

The hermeneutical analysis builds on the concepts of the hermeneutical circle, merging/alignment of horizons, and escaping from the intentionality of authors and interpreters (Gadamer, 1975; Thatchenkery, 2001). To achieve completion of the hermeneutical cycle, we have accumulated observational data not just from the focal subsidiary of our research, but added other subsidiaries' data from India, Saudi Arabia, and Thailand. Besides, we have collected secondary data about the HQ's national culture and scrutinized how such culture permeates in organizational dispositions through field notes and interviews. Inclusion of texts, archives, and site observations from MNC's various spaces and going back and forth with the collected evidence, we have achieved a representational storyline of "what" happened. In engaging a critical understanding of the storyline, we used secondary interviews and a session of focus group study with the key actors that had taken place during the implementation phase of FIS and 6S at the Turkish subsidiary. 11 professionals participated in our focus group study, which lasted about 3 hours on average. The meetings of the focus group study were also recorded, and it was transformed and stored as text files both on a cloud platform and on two separate disks after the meeting ended. To unravel naturalized practices, and taken-for-granted norms and conventions, we pushed informants by open-ended questions, enabling them to take a reflexive position for their past work. Going back and forth between the outcomes of the analysis, data, and theoretical debates, we followed the general rules of abduction to construct a narrative (Reichertz, 2009). By allowing representation of evidence on a plot, that is composed of space and time elements, narratives enable readers to better make sense of complex and rich data gathered from qualitative analyses. We constructed our narrative so that it is firmly focused on the ongoing (double)translations of FIS and 6S and the multitude of factors (micro and macro) that might have impinged the systemic disruption of power relations as the result of the former process. We start narrating our case by giving a detailed description of our site (both HQ and the subsidiary). Subsequently, we elaborate on our focal research questions under different headings to ease readers' understanding.

ELECTRO'S BACKGROUND

Electro is a leading multinational group that focuses on electronics and electrical home appliances manufacturing and distribution (enlisted among the top five Global manufacturers). The Group's Global position in terms of consolidated revenues and manufacturing capacity significantly changed between 2003 and 2007. The perceived success during the latter growth period was attributed to Mr. SSK, who led the group as the CEO from 2003 to 2007. The motto for the strategic growth period was 'fast growth and fast innovation', backed up by top-down initiatives geared to establish a solid innovation culture within the Group companies. However, the roots of establishing an innovation culture went back to 1996, when the company initiated the appropriation of two global management practices: Six Sigma and Toyota Production System (which would be renamed after 1996 as Factory Improvement System).

The initial introduction of these two global management ideas into the group was based on benchmarking efforts coupled with the consultation activities spurred by the popularity of such practices in those years. Six Sigma (6S) culture was transferred from General Electric Corporation and the Factory Improvement System (FIS) from Toyota Corporation. At the initial stage, 6S was implemented in an extensive and high-fidelity fashion (see Ansari et al., 2010), suggesting that there were only a few transformations made to the original ideas. 6S was principally built on a systematic project-based methodology to improve process efficiency by reducing defects and process variance. It was implemented by the conventional methodological protocol, acronym as DMAIC (define, measure, analyze, improve, control) by the guidance of trained experts (standard belt training like master black belts, black belts, and green belts). FIS, on the other hand, was constructed as a standardized and comprehensive set of measures and checkpoints, which operated as a benchmark tool to score and grade different company manufacturing units. Modeled over the Toyota Production System and total quality control philosophy it consists of eleven categories: Basic Orders, Clean Up, 3 Steps, Manufacturing, Equipment Maintenance, Surface Mount Technology, Injection&Press Field, Warehouse 6 Tools, Electro Static Discharge, Field Improvement Team and Memo Suggestion. Under each category, there are detailed manuals and checklists, by which each production unit in the Electro's network was systematically evaluated and graded. The two models were used jointly during the period by a systematic separation of activities and roles. Six Sigma projects were run by white-collar office workers under the auspices of the Group HQ according to the specific needs defined by the subsidiary, whereas FIS was used to evaluate, grade, and benchmark all affiliated group manufacturing plants among each other. The latter was predominantly a responsibility of the blue-collar workers, understood as a key differentiating point between the two initiatives. Initially, there was a systematic complementarity between the two initiatives, whereby 6S's innovative outputs at the subsidiary level could be diffused and implemented across other manufacturing units by using FIS' systematic benchmarking tool.

After 2007, Mr. SSK's role was transferred initially to Mr. N, and consecutively to Mr. BJK in 2010. The latter CEOs continued Mr. SSK's

tradition of introducing innovation, but they put their emphasis more on process improvements to reduce manufacturing costs alongside with breakthrough innovation and aesthetic designs. During the period between 2007 and 2010, 6S's Group-wide diffusion accelerated and became more infused with corporate values.

Observations and accumulated field data suggest that the first intra-firm modification to a global management practice was made at the Group HQ in 1996 during the appropriation of the Toyota Production System (which from then on was labeled as a Lean Production System). The initial implementation process was led by experts from Toyota Corporation, but soon after the basic framework of measures and categories were defined their ties were cut. Including a relabeling (from TPS to FIS) the initial translation of the TPS included significant changes to the original framework. The most important alteration was the use of intra-group benchmarking to foster innovation/improvement in focal firms unlike the original TPS model, which was rather reliant on intra-firm incremental improvements based on Kaizen methodology. Besides, FIS included specific manufacturing technology categories such as Surface Mount Technology, Electro-static Discharge, and Injection/Press Field, which were not the original components of the TPS model but were specific to the MNC production processes. Thus, the original translation of TPS not only included a major transformation (elimination of a major component as well as the inclusion of an alien component) of the content of the original discourse, but it also included bundling of TPS with the 6S as correlative constitutes of a comprehensive framework.

The bundled solution was rhetorically undermined as the outcomes of 6S implementation were increasingly perceived as problematic. First, heavy data requirements of projects that were conducted under 6S triggered a critical attitude inside HQ circles, since data collection and analyses considerably delayed project completion times. On top of project completion times, another negative rhetoric began circulating about the strict categorization of roles, prespecified by the methodology. According to this second line of rhetoric, because of the strict role categories like Master Black Belts, Black Belts, and Green Belts, which require certain eligibility criteria like training hours and project experience, it became harder to diffuse efficiency and innovation culture to each employee. 6S projects were offered by individual employees and they were not directly aligned with the strategic goals of the company. Since each project was offered by a different employee in a rather unorchestrated way, there was no systematic improvement over time on a project-by-project basis. Moreover, there had been an increase in the turnover rates of 6S expert roles, most of whom had developed generic skill sets about 6S projects and became certified via external bodies.

When discourse became intensified around three headings like the diminishing returns of projects, longer project times and turnover in experienced project personnel, top-level decision makers at the MNC HQ began reconsidering the intra-firm diffusion and endorsement of 6S. This discursive counter-movement against 6S continued for almost three years

when Global HQ decided not to invest in 6S in 2013. Specifically, the latter reason, that is, the turnover of role-specific personnel became a major issue in making a transition to the FIS model. The transition itself was a double-translation since the Group decided to go against a Global management practice -6S- and promote a customized model -FIS- instead. Furthermore, this transition was made to buffer critical knowledge assets within the Group by disabling the mobility of human resources with enhanced knowledge and skills. With the entrenchment of 6S across the Globe, it has been enlisted within the ISO standards. Moreover, specific project roles defined within the 6S became generic across industries and firms. Independent accreditation and certification systems emerged to grant eligibility and status for such roles. Even though it was clearly against the interests of intra-firm experts who had developed such skills, the last transition was deployed within the Group's HQ without much resistance thanks to the corporate culture that endorsed hierarchy, militaristic obedience, and vertical lines of communication.

In contrast to 6S, FIS methodology was totally dependent on internal experts, who centrally devised and improved standardized measure sets for all the manufacturing units alike. Thus, FIS was totally customized for the Group manufacturing companies and the circulation of knowledge about the production improvement processes/procedures was internal to the Group. There was no generic skill development like 6S projects because of the customization level of the system and the lack of external bodies that granted certification.

The overall storyline derived from the field visits, archives, secondary sources, and interviews made with the HQ-based informants indicated a counter-global initiative by the MNC's top management. Instead of intensifying its Global alignment with the popular meta-ideals that circulate at the transnational level and clinging to a Global management fashion to enhance its legitimacy, the MNC chose not to promote 6S. Whereas this action seemed to be engendered by rational motives, which were spurred by the negative lines of rhetoric about the inefficiency of 6S, the storyline got more complex at the subsidiary level.

STRUCTURAL CODES OF TRANS-NATIONAL MISALIGNMENT: CULTURAL CLASH, INSTITUTIONAL DIVERGENCE, AND RITUAL ADOPTION

Despite the smooth transition in the Group HQ, there were signs of double translations and resistance at the Turkish subsidiary of the Group. Evidence gathered from the local subsidiary informed that a significant source for such translation and resistance was related to the ownership structure of the local firm. Turkish subsidiary was formally established as a joint-venture firm in 1999 with a local partner, chosen among one of the strong competitors that were already active in the household electric and electronics market. In this case, the Turkish JV represented a unique one among the network of the MNC, since none of the other local partnerships engaged elsewhere were

chosen among direct competitors, making the power-dependency structure even more complicated among partners. According to the JV agreement, the manufacturing unit should distribute its products to the local market with the local partner's brand and export its products to other markets both with the MNC and local partner's brands. Being asymmetrically less dependent on local partners in other countries like Saudi Arabia or India, MNCs had to devise a more complex organizational structure and an accompanying process chart to mitigate the risks of losing control over critical know-how. The JV was operated by two chief executive officers, each of whom was appointed by two partners. The Korean CEO was made responsible for the technical processes, including the R&D, manufacturing, and technical sourcing operations, whereas the Turkish CEO was preoccupied with more marketing, sales, and channel development activities. The staff included a few expatriates from the MNC, with the majority of the human resources composed of local origin. The divide between each partner's role and responsibility allocations and the emergent aura of distrust was reified in the isolated operationalization of the management information systems. There was no full integration in the systems and software used in the company, requiring authorized staff to retrieve and feed data to separate systems manually to satisfy the requests of each partner.

The divide between the partners manifested itself in the cultural codes as well. Located in Korea, MNC inherited a hierarchically controlled, centralized organizational structure, led by autocratic leaders, whose decisions were never questioned or challenged. Despite the predominance of vertical nodes of communication and control among the members of the organization, there was also an inclination for teamwork and mutual responsibility. Interviews with the local expatriates and observations at the MNC HQ further suggested that the unquestioning and obedient behavior observed on the part of the Korean company culture was partly inaugurated by the national institutional framework. The post-Korean War trauma, and lengthy and compulsory military service led managers, all of whom were composed of males, to accept any superior order as unquestionable and natural to comply.

> "In Turkey elementary school children learn initially rights and then they learn about responsibilities. In our home country (South Korea) we were brought up predominantly with the primacy of responsibility. We used to bring towels and other cleaning equipment from our homes to do the cleaning of our classrooms at school." (Company translator, Expatriate)".

On the other hand, the local partner's culture discouraged teamwork and submissive compliance. Instead, it instilled skill sets like opportunity-seeking, negotiating, and making do with the things at hand. The only cultural dimension shared by the two partners was the vertical nodes of communication and control. Even at this dimension, MNC culture remained far more autocratic and power asymmetrical than the Turkish partner.

Apart from but related to the cultural differences between the partners, another important distinction manifested itself regarding the difference

between national institutional orders. The MNC's national institutional framework did not segregate blue-collar and white-collar work in a predefined cast-like structure from the beginning of their career. On the contrary, blue-collar work was valued and endowed with significant pay and career opportunities. Diplomas from higher education institutions were seen in equal terms with the professional experience and certifications, blurring the boundaries between white- and blue-collar work status, especially in cases when blue-collar workers had longer tenures and successful track records. Conversely, the Turkish national institutional framework casts a strong divide between white- and blue-collar work from the start. A solid line of status asymmetry was built into the system by the hierarchy of educational institutions, which could never be breached or questioned under any condition. Managerial echelons were only accessible to those with degrees from prestigious universities, erecting a career and pay barrier between white- and blue-collar work. Such separation of status differences could never be transgressed nor questioned.

The above-outlined cultural and institutional divergence between partners acted as an invisible barrier between the MNC and the local subsidiary regarding the mimetic transfer of management practices. Dependent on the white-collar work, which involved heavy computational skills and analytical project management competencies, there was very little cultural or institutional barrier for 6S to become operationalized at the subsidiary. The only dysfunctional element that enabled fast, but "ritual" adoption of the initiative was the tangible benefits that were attached to it. To promote 6S at the local subsidiary, completion of certifications and involvement in 6S projects were made compulsory for the career tracks of white-collar employees. Thus, during the initial years of implementation, there was an explosion of 6S projects, which were stalled at the later periods based on the negative feedback about the quality of outputs and/or delayed project completion times. During the focus group, some of the informants admitted that they had offered and completed ineffective 6S projects just because it was designated as a hard performance objective.

The implementation of FIS, on the other hand, significantly suffered from cultural and institutional mismatch since it was designated to be the core responsibility of the blue-collar employees and shop-floor management. Unlike Korean blue-collars, Turkish employees never internalized the responsibility of administrative activities related to work, nor did they possess such competency sets to comply with the evaluation and improvement protocols of the FIS. Higher turnover levels, lower skill sets, and weaker union bonds of the Turkish blue-collar employees caused FIS to become a responsibility of white-collar employees, perturbing the diffusion and internalization of the system. The latter resulted in lower grades awarded to the Turkish subsidiary by the reviewers of FIS at the HQ.

THE ROLE OF ACTORS: EXPERTS AND DOUBLE-TRANSLATION

Whereas cultural and institutional differences played a significant role in the adoption and implementation of imported management fashions, key actors also played a vital part in translating the HQ-mandated initiatives. The most important actor at the Turkish subsidiary was the Turkish general manager, who was transferred from the Turkish partner's electric and electronics firm in 2010. Being formerly an expert in Total Quality Management, which he framed according to the guidelines and major framework of the European Foundation for Quality Management, he deliberately and intensely imposed the EFQM Model in the company. While previous Turkish general managers were coming from a sales and marketing background, and therefore, had left the technical affairs, including R&D and quality management, to the patronage of Korean general managers, current GM passionately forced EFQM framework to the subsidiary employees. Similar to the Malcolm Baldrige Quality Award Model in the USA, EFQM was modeled over key enablers (leadership, people, policy and strategy, partnerships and resources, processes) and results (people results, customer results, society results, and key performance results), which were defined in a causally integrated way including reverse feedback and learning mechanism.

Being a rather abstract model, EFQM's adoption alongside 6S and FIS, not only diverted attention from the latter to the former but also enabled some of the key internal experts to critically question their past conduct. To instill EFQM model into the cultural system of the subsidiary the current general manager used a systematic communication and enculturation campaign based on symbols and metaphors.

> "We made use of metaphors in the employee management and leadership sections of the EFQM model, and we hang them up on the walls or distribute them to the employees as information notes. We use various kinds of written and oral instruments to make employees internalize these symbols in their everyday routines." (GM, Turkish subsidiary)

With the intense campaign, some of the experts not only embraced EFQM as an umbrella philosophy and some as an ideology, but they also engaged in a critical activity to question the consequences of past attempts at quality improvement. One of the experts claimed that the introduction of the EFQM method made him realize that the employment of 6S during the early establishment period of the subsidiary was "a major mistake." He claimed so because during the early stages of the subsidiary (between 2002 and 2010) key operational processes were subject to radical change and remained unstandardized due to rapid capacity increases. Thus, the implementation and use of 6S for processes that were neither efficient nor standardized brought about simple, uncoordinated, and costly projects, which only served for white collar engineers to earn salary increases. Instead, under the umbrella of the EFQM Model all quality improvements including FIS and 6S were incorporated, albeit with a significant focus on the former rather than the latter.

Coupled with the disenchantment of MNC HQ with the 6S in 2013, the implementation of FIS under the EFQM framework moved to the forefront. The situation was similar in other subsidiaries of the MNC, which concentrated their quality improvement efforts on FIS rather than 6S. Yet, in none of the other subsidiaries, there was evidence about integrating FIS into a novel framework. Thus, the unique structural characteristics of the subsidiary and the active role of the general manager, who previously assumed an expert role on the topic, resulted in the translation of an MNC mandate into a bricolage. The unique model was not invented anew but practically made from convenient elements that were already in use. EFQM's popularity in Turkey enabled it to penetrate an East Asian quality improvement framework with the help of hybrid actors, whose identities were shaped by different institutional and cultural frameworks.

CRITICAL REFLEXIVITY AND TRANSLATIONS: A DISCUSSION

The outlined story of the MNC informs us about an initial transition from a more Globally constructed meta-narrative (6S and TPS) about the betterment of employee management and quality improvement to a hybrid and localized initiative (FIS). The initial transition refers to a critical reflexive activity pattern, albeit a limited one, on the part of actors positioned at the MNC HQ. On the other hand, it also signifies the transition of a peripherally positioned actor (emergence of a Korean MNC) moving into the central position of the Global capitalist system (MNC). Even when such consolidation of power occurs, the doubts about being labeled as illegitimate at the meta-institutional level, emanating from peripheral roots of the MNC, rendered it to design a mimetic response, trying to create a customized, but at the same time, imitated version of the Toyota Production System. Thus, by the post-colonial theorists' claims (Bhabbha, 1995; Frenkel, 2008), MNC's hybrid identity initiated the reproduction and solidification of its very hybridity through its partly conscious engagement in mimesis.

But what happens when a hybrid encounters yet another hybrid? The story of the Turkish subsidiary informs us about the complex interaction of two hybrid, but very different, actors at the periphery. Similar to the earlier claims of scholars, who concentrated their efforts on the micro-politics of power in MNC networks (Dörrenbacher and Geppert, 2006; Delmestri and Brumana, 2017), the degree of cultural and institutional distance matters even when both sides are hybrids. Structural forces instigate barriers that are made of different values, conventions, norms, and rules, which nullify the potential positive influence that might have emerged based on hybrids' mutual identification with each other's hybridity and peripheral identity. Instead, conflicting value spheres and partially unauthorized fields of action within the domain of the subsidiary triggered local agentic action, which could only flourish in such ambivalent conditions. Moreover, such attempts seemed to fuel a level of critical reflexivity on the part of local employees, who question their past conduct with reference to the enablement that they derived from the capacity of newly introduced frames of mind. Previously

adopted 6S projects were condemned as untimely, premature, and mistaken with the novel frame of mind enabled by the EFQM Model.

Even when such a critical reflexive attitude was provoked, actors could not iterate towards further layers of questioning, which involved the undergirding assumptions of such frameworks. Their frames were often stuck within their own departments' roles, activities, and norms, rarely going beyond the boundaries of the subsidiary. Even being exposed to many different institutional orders, especially as a result of working within an MNC subsidiary, did not seem to evoke reflexivity on more abstract layers. Thanks to the strong cultural elements instilled by the current general manager's efforts, none seemed to question even the pros and cons of abandoning the certification and compensation benefits of 6S instead of an ambiguous ideology about the importance of leadership and better management of human resources. Only passive resistance was evinced in the form of paying scarce attention, reducing enthusiasm and commitment, and doing for the sake of doing alone. Many of the Turkish engineers were aware of the conflicts driven by the cultural misalignment, but only Korean expatriates were more cognizant of the clashes between the national institutional order. Thus, the findings partly illustrated the fragmented ontological status of nested cultural and institutional frames, some of which were not perceived by actors, yet others perceived but not deliberately acted upon. The latter finding informs us about the limits of agency and reflexive action under the conditions of cultural and institutional complexity.

CONCLUDING REMARKS AND THEORETICAL DISCUSSION

We aim to contribute to the transnational management knowledge diffusion/translation research stream by emphasizing both temporal and contextual effects that induce (double) translations in an MNC subsidiary. In this way, we focused on intentional resistance displayed by the corporate elite to the globally circulating meta-institutional discursive pressures, which was countered by contextual translations to their own initiative. The case provided us with ample evidence about how the initial resistance to essentialist global rhetoric triggered local translations based on locally enabled bricolage of ideas and practices. We found that experts located in the subsidiaries often enjoyed significant levels of autonomy to display agentic behavior in denouncing/renouncing/editing both symbolic and material components of managerial practices. Thus, our findings corroborate Frenkel's (2008) theoretical arguments, which propose that actors positioned in different locations of a multinational are likely to display strategic agency because of their heightened awareness emanating from their exposure to a multitude of cultures and institutions. The unauthorized fields of action, which were often rife with conflict, are likely to open up ambiguous, but fertile spaces for strategic and/or political display of agency. Relatedly, it can be argued that the complexity of the network configuration of an MNC, emanating from ownership arrangements and/or diversity of local market positions potentially stimulates non-linear and often dialectic patterns of

knowledge circulation and translation. Yet, the degree of reflexivity engendered by such spaces is still far from exhausting intellectual boundaries, making actors stuck in their hybrid frames, which partly constitute the Global ideals of the dominant order.

REFERENCES

Abrahamson, E. (1996). Management fashion, academic fashion, and enduring truths. Academy of Management Review, 616–618.

Ansari, S. M., Fiss, P. C., & Zajac, E. J. (2010). Made to fit: How practices vary as they diffuse. Academy of Management Review, 35(1), 67–92.

Ashcroft, B., Griffiths, G., & Tiffin, H. (2007). The post-colonial studies reader: Key Concepts. New York: Taylor & Francis.

Banerjee, S. B., & Prasad, A. (2008). Introduction to the special issue on "Critical reflections on management and organizations: a postcolonial perspective". Critical Perspectives on International Business, 4(2/3), 90–98.

Barley, S. R. (1986). Technology as an occasion for structuring: Evidence from observations of CT scanners and the social order of radiology departments. Administrative Science Quarterly, 78–108.

Bhabha, H. K. (1994a). The location of culture. London: Routledge.

Bhabha, H. K. (1994b). Of mimicry and man: The ambivalence of colonial discourse. In H. K. Bhabha (Ed.), The location of culture: 85–92. London & New York: Routledge.

Bhabha, H. K. (1996) Cultures in between. In S. Hall and P. du Gay (Eds.) Questions of Cultural Identity, London: Sage, 53–60.

Bleicher, J. (1980). Contemporary Hermeneutics: Hermeneutics as Method, Philosophy and Critique. London: Routledge Kegan Paul.

Bouquet, C., & Birkinshaw, J. (2008). Managing power in the multinational corporation: How low-power actors gain influence. Journal of Management, 34(3), 477–508.

Boussebaa, M., & Morgan, G. (2014). Pushing the frontiers of critical international business studies: The multinational as a neo-imperial space. Critical Perspectives on International Business, 10(1/2), 96–106.

Boussebaa, M., Morgan, G., & Sturdy, A. (2012). Constructing global firms? National, transnational and neocolonial effects in international management consultancies. Organization Studies, 33(4), 465–486.

Clegg, S., & Palmer, G. (1996). Introduction: Producing management knowledge. The politics of management knowledge, London: Sage, 1–18.

Czarniawska, B. & Joerges, B. (1996). Travels of Ideas. In B. Czarniawska & G. Sevón (Ed.), Translating Organizational Change (pp. 13–48). Berlin, New York: De Gruyter.

Czarniawska, B., & Sevón, G. (Eds.). (2005). Global ideas: How ideas, objects and practices travel in a global economy (Vol. 13). Copenhagen Business School Press.

Czarniawska, B., & Sevón, G. (Eds.). (1996). Translating organizational change. Berlin: Walter de Gruyter.

Delmestri, G., & Brumana, M. (2017). The multinational corporation as a playing field of power: A Bourdieusian approach. In Multinational corporations and organization theory: Post millennium perspectives (pp. 325–353). Emerald Publishing Limited.

Dörrenbächer, C., & Gammelgaard, J. (2011). Subsidiary power in multinational corporations: the subtle role of micro-political bargaining power. Critical Perspectives on International Business, 7(1), 30–47.

Dörrenbächer, C., & Geppert, M. (2009). A micro-political perspective on subsidiary initiative-taking: Evidence from German-owned subsidiaries in France. European Management Journal, 27(2), 100–112.

Dörrenbächer, C., & Geppert, M. (2006). Micro-politics and conflicts in multinational corporations: Current debates, re-framing, and contributions of this special issue. Journal of International Management, 12(3), 251–265.

Erçek, M., & Say, A. İ. (2008). Discursive ambiguity, professional networks, and peripheral contexts: The translation of total quality management in Turkey, 1991–2002. International Studies of Management & Organization, 38(4), 78–99.

Ferner, A., Edwards, T., & Tempel, A. (2012). Power, institutions and the cross-national transfer of employment practices in multinationals. Human relations, 65(2), 163–187.

Foucault, M. (1977). Discipline and punish: The birth ofthe prison. London: Allen Lane.

Frenkel, M. (2008). The multinational corporation as a third space: Rethinking international management discourse on knowledge transfer through Homi Bhabha. Academy of Management Review, 33(4), 924–942.

Gabriel, Y. (1991). Turning facts into stories and stories into facts: A hermeneutic exploration of organizational folklore. Human Relations, 44(8), 857–875.

Gadamer, H. G. (1975). Truth and method. New York: Seabury.

Gaventa, J., & Cornwall, A. (2008) Power and knowledge, Reason, P. & H.Bradbury (eds.) The Sage handbook of action research: Participative inquiry and practice, London, Sage:172–189.

Geppert, M., Williams, K., & Wortmann, M. (2015). Micro-political game playing in Lidl: A comparison of store-level employment relations. European Journal of Industrial Relations, 21(3), 241–257.

Gond, J. P., & Boxenbaum, E. (2013). The glocalization of responsible investment: Contextualization work in France and Quebec. Journal of Business Ethics, 115, 707–721.

Gopinath, C., & Prasad, A. (2013). Toward a critical framework for understanding MNE operations: Revisiting Coca-Cola's exit from India. Organization, 20(2), 212–232.

Hardy, C. & Clegg S.R. (2006) Some dare call it power, Clegg, S. R., Hardy, C., Lawrence, T., & Nord, W. R. (Eds.). The Sage Handbook of Organization Studies. London, Sage: 754–775.

Heusinkveld, S., & Benders, J. (2012). On sedimentation in management fashion: an institutional perspective. Journal of Organizational Change Management, 25(1), 121–142.

Heusinkveld, S., Benders, J., & Hillebrand, B. (2013). Stretching concepts: The role of competing pressures and decoupling in the evolution of organization concepts. Organization Studies, 34(1), 7–32.

Kostova, T., & Roth, K. (2002). Adoption of an organizational practice by subsidiaries of multinational corporations: Institutional and relational effects. Academy of Management Journal, 45(1), 215–233.

Jack, G., & Westwood, R. (2006). Postcolonialism and the politics of qualitative research in international business. Management International Review, 46, 481–501.

Mignolo, W. D., & Schiwy, F. (2003). Transculturation and the colonial difference: double translation. Translation and ethnography: The anthropological challenge of intercultural understanding, 12–34.

Noorderhaven, N. G. (2004). Hermeneutic methodology and international business research. In Handbook of qualitative research methods for international business (pp. 84–104). Edward Elgar.

O'Mahoney, J. (2016). Archetypes of translation: Recommendations for dialogue. International Journal of Management Reviews, 18(3), 333–350.

Palmer, R. E. (1969). Hermeneutics: Interpretation Theory in Schleiermacher, Dilthey, Heidegger, and Gadamer. Northwestern University Press.

Prasad, A. (2002). The contest over meaning: Hermeneutics as an interpretive methodology for understanding texts. Organizational Research Methods, 5(1), 12–33.

Said, E. (1978). Orientalism: Western concepts of the Orient. New York: Pantheon.

Said, E. (1993). Culture and imperialism. New York: Vintage.

Sayım, K. Z. (2010). Pushed or pulled? Transfer of reward management policies in MNCs. The International Journal of Human Resource Management, 21(14), 2631–2658.

Spivak, G. C. (1988). Can the Subaltern Speak? Die Philosophin, 14(27).

Sturdy, A. (2009). Popular critiques of consultancy and a politics of management learning?. Management Learning, 40(4), 457–463.

Thatchenkery, T. J. (2001). Mining for meaning: Reading organizations using hermeneutic philosophy. The language of organization, 112–131.

Townley, B. (1993). Foucault, Power/Knowledge, and Its Relevance for Human Resource Management. The Academy of Management Review, 18(3), 518–545.