International Journal of Human Capital Management
E-ISSN 2580-9164
Vol. 8, No. 2, December 2024, p 70-78

Available online at
http://journal.unj.ac.id/unj/index.php/ijhcm

THE INFLUENCE OF E-LEARNING ON INNOVATIVE WORK BEHAVIOR IN COMPANIES: A THEORETICAL REVIEW

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ABSTRACT

This study aims to examine the influence of e-learning on Innovative Work Behavior (IWB) within corporate environments through a theoretical literature review. The research employed a qualitative approach using a literature review method by analyzing 20 peer-reviewed journal articles sourced from databases such as Publish or Perish and Mendeley. Of these, 11 studies utilized quantitative methods while the rest applied qualitative approaches. The articles were selected using non-probability sampling techniques, including random and snowball sampling, focusing on keywords such as e-learning, digital learning, and training. VOS viewer was used for bibliometric analysis and visualization of research trends related to e-learning. The findings reveal that e-learning has developed significantly and is closely associated with key factors such as digital learning, learning motivation, learning effectiveness, and employee performance. E-learning platforms have shown to not only improve knowledge transfer and training efficiency but also encourage innovative behaviors among employees by enhancing flexibility, collaboration, and engagement. Visualization analysis showed a growing trend in research related to e-learning and innovation, with several research areas still underexplored, particularly regarding how digital learning influences the generation and implementation of new ideas at work. This study concludes that e-learning serves as a strategic tool for developing innovative work behavior, contributing both to organizational performance and to the advancement of knowledge in human resource management and educational technology.

Keywords: E-learning, Innovative Work Behavior, Employee Performance, Motivation

Publish: December, 2024

How to Cite:
Kartini, T.M., Sariwulan, Rd, T., Dara, D., & Susita, D. (2024). The Influence of E-Learning on Innovative Work Behavior in Companies: A Theoretical Review. *International Journal of Human Capital Management, 8(2), 70-78. Special Issue: International Management Science Conference (IMSC) 2024.* https://doi.org/10.21009/IJHCM.08.02.6

INTRODUCTION

Technology and communication have brought significant transformation to the field of learning, both in education and within organizational contexts in companies. One manifestation of this progress is the emergence of e-learning, a digital learning method that utilizes information and communication technology. E-learning not only serves as a solution to overcome spatial and temporal limitations but also represents a relevant approach to enhancing the effectiveness of training and human resource development within companies (Chung-Hung & Hwang-Yeh, 2021). Historically, e-learning is not a new concept. Since the early 1960s, the use of computers as a learning medium has been implemented in various institutions. The PLATO system at the University of Illinois is an early example of computer-assisted instruction widely used for decades (Debowski, 2006). With the advent of the internet in 1969 and rapid digitalization, e-learning has evolved into an integrated, easily accessible, and flexible learning platform, making it highly suitable for the needs of modern companies (Rains & Bonito, 2020).

In today's digital era, companies no longer need to bear high costs for face-to-face training or gather employees in one location. E-learning enables training to be conducted online, anytime and anywhere, using various digital devices. This not only provides cost efficiency but also creates a dynamic and adaptive work environment responsive to change (DeSanctis & Poole, 1994).
Beyond merely delivering material, e-learning also holds great potential to foster innovative work behavior among employees. Innovative work behavior encompasses the processes of generating new ideas, proposing creative solutions, and applying unconventional approaches to solving workplace problems (Smith & Lee, 2022). With access to flexible, technology-based learning, employees are encouraged to be more active, independent, and open to change—key characteristics that drive innovation in the workplace (Johnson et al., 2021).

According to Adaptive Structuration Theory (AST) developed by DeSanctis & Poole (1994), information technology is not merely a tool but also exerts structural influence on organizational processes, including work behavior. In this context, e-learning can be seen as a technology that shapes how individuals and groups work, learn, and innovate. Therefore, it is important to theoretically review how e-learning contributes to the development of innovative work behavior within companies, especially in the context of continuously evolving modern technology. This review is expected to provide a comprehensive understanding of the relationship between technology and organizational behavior, as well as serve as a foundation for companies to develop more effective and innovative employee development strategies.

The purpose of this article is to theoretically examine the influence of e-learning on employees' innovative work behavior in companies within the context of modern technological developments, thereby offering insights and recommendations for human resource development in organizational settings.

LITERATURE REVIEW

The development of technology and communication has brought about a significant transformation in the world of learning, both in the field of education and within the context of organizational settings. One of these advancements is the emergence of e-learning, a digital-based learning method that utilizes information and communication technology. E-learning not only serves as a solution to overcome limitations of space and time, but also as a relevant approach to enhance the effectiveness of training and human resource development within companies (Chung-Hung & Hwang-Yeh, 2021).

Historically, e-learning is not a new concept. Since the early 1960s, the use of computers as a learning medium has been applied in various institutions. The PLATO system at the University of Illinois was an early example of computer-assisted instruction that was widely used for decades (Debowski, 2006). With the advent of the internet in 1969 and the rapid pace of digitalization, e-learning evolved into an integrated, accessible, and flexible learning platform, making it highly suitable for the needs of modern companies (Rains & Bonito, 2020).

In this digital era, companies no longer need to incur high costs for face-to-face training or gather employees in a single location. E-learning enables training to be conducted online, anytime and anywhere, using various digital devices. This not only provides cost efficiency but also creates a dynamic work environment that is adaptive to change (DeSanctis & Poole, 1994; Zhang et al., 2021).

According to Kumar (2014), as updated by recent studies, the key indicators of e-learning include : Learning Materials and Evaluation: Presentation of content in modules, complete with evaluation questions and feedback. Interactivity : Formation of online communities to support and share information. Online Instructors: Presence of instructors online to provide guidance and facilitate discussions. Multimedia: Use of audio and video to capture attention and increase learner participation. Opportunities for Collaboration: Use of online meeting software that allows for collaborative learning in real time.

Innovative Work Behavior (IWB) refers to employee behavior related to the creation and implementation of new ideas that are beneficial to the organization. According to Janssen (2000) : IWB is the intentional behavior of generating, promoting, and applying new ideas in the workplace. De Jong & Den Hartog (2010) define IWB as the creation and implementation of new and useful ideas, products, or procedures. Scott & Bruce (1994) describe IWB as a process of actively seeking, developing, and implementing new solutions to improve work performance. Indicators of Innovative Work Behavior include: Idea Generation: The ability to generate new ideas or solutions. Idea Promotion: The ability to propose and convince others of the value of the ideas. Idea Realization: The ability to effectively implement ideas in the workplace.

Flexible and technology-based learning access through e-learning encourages employees to become more proactive, independent, and open to change traits that are essential in supporting workplace innovation (Smith & Lee, 2022). Recent research has shown a positive correlation between the adoption of e-learning and the increase in innovative work behavior within organizations (Kim & Park, 2021; Liu et al., 2023; Zhou et al., 2022). E-learning platforms allow employees to access knowledge quickly and continuously, thereby enhancing creativity and innovation in their work.

According to the Adaptive Structuration Theory (AST) developed by DeSanctis & Poole (1994), information technology is not merely a tool but also exerts a structural influence on organizational processes, including work behavior. In this context, e-learning can be seen as a technology that shapes how individuals and groups work, learn, and innovate. Despite its many advantages, the adoption of e-learning faces several challenges such as limited internet access, security issues, and user acceptance (Mattila et al., 2020; Sathye, 2021). User attitudes and acceptance significantly affect the successful implementation of new information systems

(Venkatesh & Davis, 1996). Systems that are tailored to user needs tend to show higher adoption rates and more successful outcomes (Pikkarainen et al., 2020).

Knowledge management, according to Robbins & Judge (2015), is the ability to work by understanding and motivating both individuals and groups. Budihardjo (2017) emphasizes the importance of knowledge management in transferring knowledge, skills, and effective work behaviors. Gurteen (2012) describes knowledge management as a human-centered process of sharing knowledge, learning, and collaborating effectively. The main dimensions of knowledge management include personal knowledge, work procedures, and the use of technology (Gurteen, 2012). The application of information technology that supports collaboration, communication, and the search for and access to knowledge becomes a key factor in driving organizational innovation (Liu et al., 2023; Tan & Lau, 2021).

Based on theoretical reviews and recent research, e-learning as a technology-based learning system plays a critical role in fostering innovative work behavior in organizations. With better knowledge access, flexible learning, and technological support, companies can cultivate employee creativity and innovation needed to compete in an ever-evolving technological era.

METHODOLOGY

This study aims to theoretically examine the relationship between e-learning and innovative work behavior through a literature review of various relevant scientific articles. The type of approach used in this study is a qualitative approach, in the form of a theoretical review. The method applied is the literature review method. The data used in this study is derived from scientific journal articles, with the following characteristics: out of the 20 journal articles reviewed, 11 articles employed a quantitative approach, while the rest used a qualitative approach. This study does not use primary data, but rather secondary data from previous research findings.

The data collection instrument was carried out by searching for articles using keywords such as *digital learning*, *e-learning*, *digital training*, and *e-training* from the Publish or Perish and Mendeley databases. These articles were then filtered based on publication year and topics related to human resource management. The filtering process was further refined to select articles that specifically addressed the main variable of this study, namely e-learning. The sampling method used in the reviewed literature employed a non-probability sampling approach, using random sampling and snowball sampling techniques, by tracing references from the initial articles to find additional relevant articles.

The analysis procedure involved examining the data analysis techniques used in each article. Several articles employed quantitative analysis, such as those conducted by Lantu et al. (2023), Rahmani et al. (2022), Singh et al. (2023), and Haffar et al. (2023) using the SEM/Smart PLS 3 approach. Meanwhile, the article by Ghosh et al. (2023) used a data analysis technique based on Python software version 3.7.4 and Process Macro (pyprocessmacro V.1.0.8) developed for Python.

RESULT AND DISCUSSION

Result

Research on e-learning has developed significantly. Through the VOS Viwer platform, which is used to visualize current research trends on e-learning, we have managed to find more specific topics. Here are the results of e-learning visualization with the VOS Viwer platform:

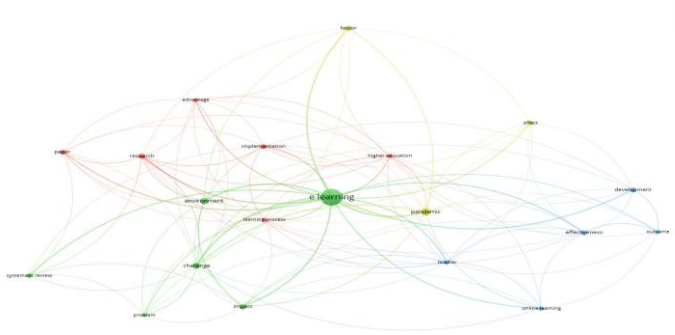

Figure 1 Visualization of e-learning with VOS Viwer platform

From the display of Figure 1 above, related to the results of the VOS viewer analysis, each network between variables is drawn based on the connected colors, in this study, the focus is on digital learning.

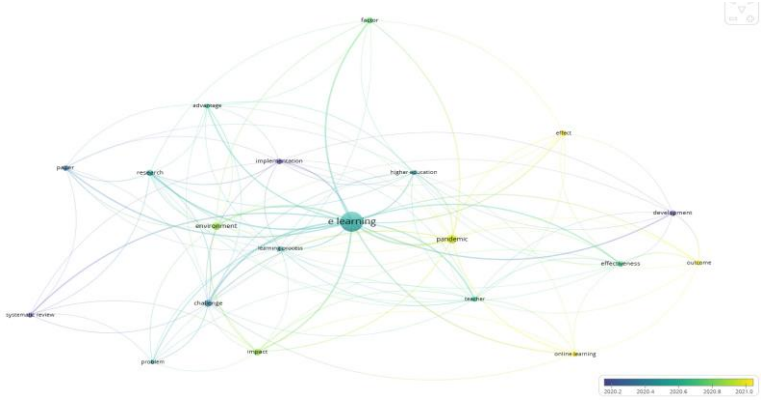

Figure 2 Visualization of e-learning by year

From the figure above visualization to see the topic or theme based on the year of research publication differentiated by color is done, to take the novelty associated with the development of publications.

The following is a density visualization of the e-learning variable:

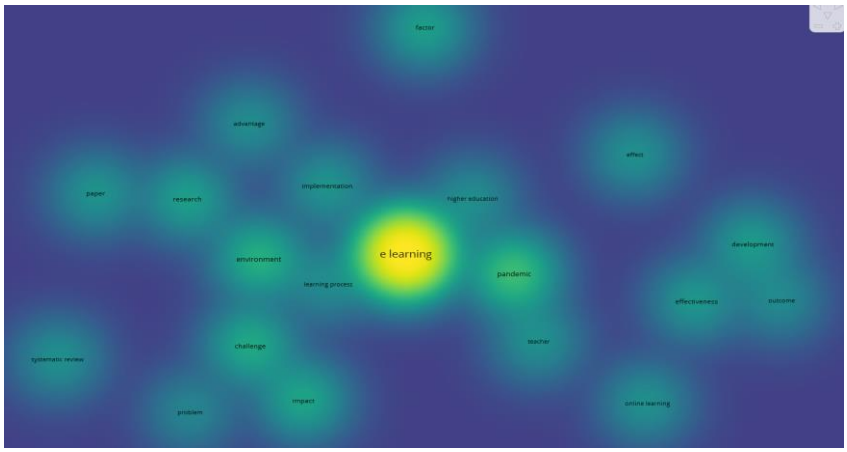

Figure 3 Density visualization

The results of this density visualization analysis still show some areas that are not saturated to be revealed by further research. Based on the results of Vos Viewer, the researcher digs deeper

into digital learning, learning motivation, effectiveness, effect, development on student or employee performance. Digital learning not only improves student learning and employee training, but is now able to improve the efficiency and results of the training process, especially for corporate employees. Research on e-learning has developed significantly, especially in relation to Innovative Work Behavior (IWB) in companies. Based on an analysis using the VOS viewer platform, which is used to visualize the latest research trends on e-learning, several specific topics closely related to IWB were identified.

From the visualization produced by VOS viewer, it can be seen that the network between variables related to e-learning and innovative work behavior shows a strong correlation, particularly in the context of digital learning, which influences learning motivation, learning effectiveness, and its impact on employee performance in companies.
Visualization based on the year of publication shows a continuous increase in research themes, indicating growing attention to the influence of e-learning on innovative behavior in the workplace. In the density visualization, some areas still show research potential that has not been fully explored, especially regarding how e-learning can encourage employees to develop new ideas, promote innovation, and apply it in daily work activities.

Based on these results and existing references, it can be concluded that e-learning not only plays a role in enhancing employee learning and training but also significantly improves the efficiency and outcomes of these training processes. This, in turn, positively impacts the enhancement of employees' innovative work behavior, which is a crucial factor in maintaining a company's competitiveness in the digital era and dynamic markets. Therefore, the development and implementation of effective e-learning platforms need to be continuously optimized to support an innovation culture within companies by improving employees' knowledge, skills, and motivation to innovate.

Discussion

From the results of the research above, it is supported by the study of Linzalone et al. (2020) that the Digital Learning Platform (DLP) is a virtual learning space where companies and universities can interact. The definition of design requirements is critical to the effectiveness of DLPs and needs to be carefully supported. Various criteria are proposed considering the different stakeholders involved in the DAE learning platform (Universities, Companies, students, employees), as well as aligning with the short-term and long-term goals of the relationship between Universities and Entrepreneurship. Research by Oke & Fernandes (2020) shows opportunities for the education sector to utilize innovations related to the Fourth Industrial Revolution (4IR) through research and teaching to improve learner experience; however, this may require significant improvements in the educational curriculum as well as investments. Nilsson & Lund (2023) suggest that D3 has the opportunity to promote deep learning experiences with a framework that encourages teachers and researchers to study, explore, and analyze applied design practices, where teachers participate in the design process. Hevi et al. (2023) found that asynchronous learning partially mediates the relationship between digital learning space experience and learners' continuous use, but the mediating effect of synchronous learning between digital learning space experience and continuous use by learners is not significant. Santally et al. (2020) argue that the EMM in its current form is better suited for assessment in universities that operate entirely as open or virtual universities than for dual-mode or traditional universities that promote technology-based learning.

Meanwhile, Napolitano et al. (2020) reported that current freshmen consume more fast food per week compared to new students previously, but fewer high-fat snacks and sugary drinks. Findings by Cui & Yang (2023) suggest that while social elements increase active learning intentions, achievement and immersive elements tend to weaken them. The spirituality of the learning place acts as a mediator in the relationship between game elements and active learning

intentions. Furthermore, the moderating effect of different patterns of play behavior is emphasized. Akdere & Egan (2020) found that leadership transformation through leader learning and performance support behaviors relates to a supportive HRD culture, which in turn positively impacts employee job satisfaction and customer/patient satisfaction. Bonnes (2022) found that trainers attending digital media courses showed higher didactic-media competence and self-efficacy scores and used digital media more frequently in training, with no significant differences in negative attitudes.

Rasheed et al. (2022) demonstrated that SERVQUAL has a significant positive relationship between dependent and independent variables. Although student satisfaction showed a low R2 compared to other variables, it still revealed a nearly strong and positive relationship with student satisfaction. Sprenger & Schwaninger (2023) found that perceived usefulness significantly predicts intention to use after three months. In GETAMEL, perceived usefulness significantly predicted intention to use three of the four learning technologies, while subjective norms only predicted intention to use mobile virtual reality. Kaizer et al. (2020) showed that various hardware and software platforms have driven the use of virtual reality (VR), augmented reality (AR), and artificial intelligence (AI) resources in corporate training. Haj-Bolouri et al. (2021) indicated that action design has a significant positive impact on systematically organizing Workplace Learning (WPL) in organizations, as well as creating a narrative that structures the research process and outcomes.

Lantu et al. (2023) found that various combinations of UTAUT model-based antecedents in achieving e-learning acceptance in the workplace are supported by PLS-SEM and fsQCA results. Both analyses show performance expectancy as the strongest predictor of e-learning intention. Rahmani et al. (2022) identified IoT-based systems, cloud-based services, virtual classes, and evaluation tools as four significant factors influencing attitudes, content management, and creativity. These factors are also significant for the success of employee learning programs. Shahriar et al. (2023) highlighted that the digital learning ecosystem offers flexibility in time, place, and pace, providing important convenience during the COVID-19 crisis. From a human resources perspective, the e-learning culture has enabled organizations to quickly adopt the new normal, ensuring sustainable organizational development and promoting decent work and growth within and across organizations. R. Singh et al. (2023) showed that digital entrepreneurship education and training positively influence entrepreneurial competence and entrepreneurial intention (EI), with entrepreneurial competence mediating the relationship between digital education/training practices and EI.

Innab (2022) found that e-learning motivation partially mediates the relationship between technology access and satisfaction with e-learning. Ghosh et al. (2023) revealed that perceptions of Online Learning Platform (OLP) features significantly affect employee Work Engagement (WE). Organizational Commitment (OC) and ease of use also significantly influence WE. Perceptions of OLP features indirectly affect WE through learners' personality traits. Additionally, financial incentives for online learning have a negative interaction effect with OLP features on WE. Haffar et al. (2023) contributed novel insights by showing that types of OC affect different dimensions of Employee Readiness for Future Change (ERFC), each impacting Employee Adaptive Change Capability (EACC) differently. Two ERFC dimensions, self-efficacy and personal valence, act as full mediators between group culture/adhocracy culture and EACC.

Importantly, the integration of e-learning and digital platforms has also been shown to positively influence Innovative Work Behavior (IWB) among employees. Enhanced knowledge sharing, flexibility, and continuous learning opportunities provided by these platforms encourage employees to generate, promote, and implement new ideas at work. Studies indicate that factors such as performance expectancy, motivation, and organizational support facilitated by e-learning environments are significantly associated with higher levels of IWB. This suggests that digital learning not only improves employee skills and engagement but also drives innovation behavior, which is critical for organizational adaptability and competitive advantage in dynamic markets.

CONCLUSION

This study shows that e-learning has developed significantly and has made a tangible contribution to enhancing Innovative Work Behavior (IWB) in corporate environments. Through the visualization of research trends using VOS viewer, it was found that topics related to digital learning, learning motivation, effectiveness, and their impact on employee performance are strongly associated with the increase in workplace innovation. The findings indicate that e-learning not only serves as a tool for training and skill development but also acts as a driver of innovative behavior by improving flexibility, engagement, and knowledge collaboration within organizations. In other words, e-learning plays an important role in addressing the challenges of employee innovation development and also contributes to the advancement of knowledge in the fields of human resource management and educational technology.

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