DOI: https://doi.org/10.65537/jebr.202691.172

UDK: 005.591.6:004
Paper received: February 2, 2026
Paper accepted: April 17, 2026

Journal of Entrepreneurship
And Buisiness Resilience
Year IX • Vol 9, No 1.
pp. 7–30

ORIGINAL SCIENTIFIC PAPER

Digital Learning, Digital Transformation, and Organizational Resilience: An Innovation Creation Source

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ABSTRACT

Based on current practices, the objective of this study is to assess and analyze the status of digital learning in corporate sectors and its role in facilitating emerging processes of digital transformation and organizational resilience. The research employs a qualitative methodology, emphasizing the collection and analysis of digital learning data from companies at the global level through available resources, with a specific case study on American companies. Primary findings indicate that traditional learning methods are largely outdated and that e-learning has become an essential necessity for companies operating in an environment shaped by rapid technological change, uncertainty, and continuous digital transformation. In this context, digital learning contributes not only to innovation creation and workforce adaptability but also to strengthening organizational resilience and long-term competitiveness. The paper

concludes with a series of recommendations and avenues for future research.

Keywords: Digital transformation, Digital learning, American companies, Resilience, Traditional learning methods.

JEL classification: I21, O33, H12

INTRODUCTION

In today's world, characterized by rapid technological development and the increasing use of the internet, there is no doubt that we live in a digital age. This transformation began with the advent of the internet, which has reshaped daily life, and the business world is no exception. Technology has fundamentally altered business operations, marking the onset of a fourth industrial revolution.

The acceleration of technological advancements has intensified competitive pressures, making long-term sustainability a formidable challenge for companies. Consequently, digital transformation has become an imperative rather than a choice. Moreover, the COVID-19 crisis has underscored the critical need for digital technologies, revealing that companies already embracing digitalization were better positioned to adapt and withstand the crisis.

For companies to thrive in a digital future, they require employees equipped to navigate a rapidly evolving digital environment. The key to success lies in the training and development of digital skills, which are essential for ensuring successful digital transformations. Digital transformation occurs when a company transitions its employees to perform tasks, manage information, share knowledge, and collaborate within a digital context. In light of this, the central research problem

addressed in this paper is: **How can a favorable environment be created and developed through digital training to facilitate the digital transformation of companies?**

The aim of this study is to contribute to the discussion on the importance of corporate digital learning, its benefits, and its role in enhancing employee competencies, thereby aiding companies in achieving digital transformation. This process depends not only on digital learning but also on the digital environment of employees, which is a key determinant of success—an aspect this research seeks to highlight.

The methodological approach adopted is qualitative, based on the analysis of the digital sector. This method is deemed most appropriate for the research, as it enables a thorough identification of e-learning factors that promote the integration and development of digital transformation. The study covers the latest statistics up to 2021 and involves collecting information from multiple secondary sources, including international databases specializing in the digital domain. The research formulation is based on a descriptive and analytical approach, with the descriptive method used to outline research variables and the analytical method applied to the case study.

The article is structured as follows: Part 1 presents a literature review on digital learning and digital transformation. Part 2 introduces a conceptual framework for the digital environment, followed by an analysis of digital learning data and a case study in Part 3. The paper concludes with a discussion, conclusion, and suggestions for future research.

THEORETICAL FRAMEWORK

Digital Learning

Digital learning is a contemporary term for educational

technology, first proposed by Jay Cross in 1999 [1]. It was previously referred to as e-learning, electronic learning, and technology-enhanced learning [2]. Digital learning encompasses various terminologies, such as internet-based training, web-based training, online learning, network learning, or distance learning [1].

Computers and electronics use binary digits (1s and 0s) to represent data; the resulting information and instructions are termed digital information. Learning that utilizes this digital information is called digital learning. Although the concept is complex and interpretations vary in the literature, the most representative definition is provided by the American Society for Training and Development (ASTD): "Digital learning is the process by which learners apply digital media to learning, where digital media include the internet, corporate networks, computers, satellite broadcasting, audiotapes, videotapes, interactive TV, and compact disks" [1].

Corporate Digital Learning

Companies must enhance employee skills and training efficiency, as these are critical to success and continuity. Corporate digital learning provides the technologies and tools to support this objective, improving engagement, knowledge transfer, and job performance [3].

Corporate digital learning is not merely an approach to employee training, a content delivery format, or a set of guidelines for creating e-learning content [4]. Rather, it represents an openness to adapting corporate skills acquisition and performance support to the needs, goals, and behaviors of modern learners [5].

Historically used methods for corporate training may no longer be effective. Companies now require self-service problem-solving

using digital tools. Digital learning offers an incredibly effective way not only to achieve this but also to attract new employees quickly and efficiently while providing continuous learning and development opportunities throughout the employee lifecycle.

Digital learning offers numerous benefits for both employees and companies, including [6]:

- Cost savings (reducing expenses related to training rooms, travel, catering, and materials);

- Reduced learning time (minimizing travel time, breaks, and group-based teaching delays);

- Just-in-time accessibility (employees access training when convenient and capable);

- Ongoing access to key resources (employees access resources precisely when needed);

- A risk-free learning environment (eliminating embarrassment from failure in front of peers);

- Scalability for any number of employees;

- Timely feedback for employees and managers (online tracking of course performance and individual progress);

- Flexibility to fit employees' lifestyles;

- Environmental sustainability (reduced paper use, waste, and carbon emissions).

- "Most students demonstrated a positive attitude toward online classes due to their flexibility for both learners and instructors, which contributed to maintaining educational continuity and organizational resilience"[39] .

Digital Transformation and E-Learning

Recently, the concept of digital transformation has gained

significant traction due to the rapid emergence of new technologies. It has become a major force reshaping industries and influencing corporate operations [7]. Digital Transformation (DT) refers to the process of using digital technologies to create new—or modify existing—business processes, cultures, and customer experiences to meet evolving business requirements. It represents the reimagining of business in the digital age [8]. True digital transformation is not merely about adopting specific new technologies (which is digitalization) but about a company's ability to effectively utilize new technologies and procedures—both now and in the future [9].

The Digital Transformation of Learning is "the innovative application of technologies that creates new paradigms for corporate training and learning in general; it goes beyond the digital 'delivery' of training, involving a fundamental mindset change in how companies approach learning and training for the future workforce" [7]. Digital transformation requires an understanding of the speed of change, acknowledging that what is new today may be obsolete within 12 months [10]. E-learning, consisting of online training, helps companies accelerate this transformation. It is not only part of the learning, development, and human resource toolkit but also a tool for collecting, sharing, and retaining knowledge essential for digital transformation success [11].

In this paradigm, learning becomes more measurable and scalable, while changes in business models make operations more virtual, automated, and interconnected. Decisions about when, how, and where employees learn can no longer be confined to specific times or places. Thus, embracing the digitalization of employee learning has become a critical success factor for companies [7]. However, if employees cannot harness the potential of these technologies, investments may be wasted [12]. Companies

must rethink how employees learn and develop skills by integrating more digital components to foster a culture of continuous e-learning—this is termed a digital learning strategy. This involves learning through digital assets such as videos, online courses, blogs, podcasts, and articles, enabling continuous skill development in a dynamic workplace [13].

The digital learning strategy is integral to a company's digital transformation strategy, and understanding its importance is vital for success [13]. In this context, Declan Fox suggests four strategies for transforming learning [14]:

1. Spreading digital learning over longer periods than traditional courses;

2. Designing learning experiences based on actual work situations for immediate application;

3. Creating and selecting content to enrich learning and provide context;

4. Maintaining social connections through collaboration, discussions, and feedback opportunities.

Conditions for Digital Transformation in Companies

"The biggest challenge for digital transformation isn't the technology; it's the people" [15]. While new technology is a prerequisite, the most critical aspect is developing, enhancing, and evaluating the digital capabilities of employees for the coming years [16]. Although many companies are embarking on digital transformation, not all possess the requisite capabilities [17]. A lack of digital skills can hinder the process [18]. Digital learning is a key ingredient for companies undergoing digital transformation to realize benefits in operational efficiency and customer experience [18]. Thus, the main challenges for successful digital

transformation are more closely related to human resources and organizational culture than to technological considerations [16].

The conditions necessary for employees to support digital transformation include [19]:

- **Information:** browsing, searching, filtering, evaluating, storing, and retrieving information.

– **Communication:** interacting via technology, sharing information and content, digital collaboration.

– **Content Creation:** developing content, integrating and reworking materials, understanding copyright and licenses.

– **Safety:** protecting devices, personal data, and the environment.

– **Problem Solving:** resolving technical issues, identifying technological needs and responses, innovating, and using technology creatively.

Eleni Zoe's research identifies the following competencies as basic conditions for digital transformation [20]:

- Device setup (turning on/off devices, logging in, connecting to Wi-Fi);
- Digital communication (using email and apps like WhatsApp);
- Digital collaboration (uploading, sharing, and editing documents via cloud-based apps);
- Cybersecurity (understanding basic risks like viruses and unsecured sites);
- Information processing (seeking, verifying, organizing, and summarizing online information);
- Data storage (storing and backing up data in the cloud);
- HR processes (managing payments, leave forms, and digital

signatures);

- E-learning (using Learning Management Systems for training).

METHODOLOGY AND FINDINGS

Methodology

This paper investigates the impact of digital learning on digital transformation in businesses. The research is secondary in nature, referencing statistical data from various international e-learning databases [21]. A case-based approach is employed, focusing on US companies as the largest players in the global e-learning industry. The analysis covers the latest statistics on e-learning usage in companies and its impact compared to traditional learning methods.

Findings

Key Data on E-Learning in Companies:

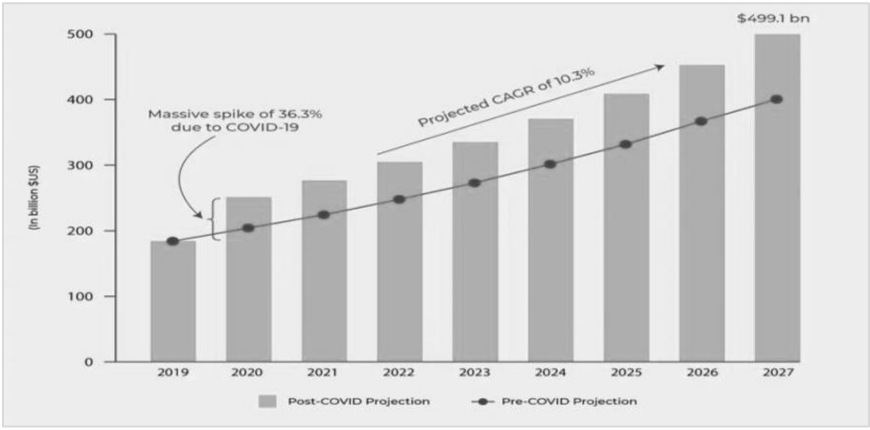

Fig. 1: The Evolution of the E-Learning Industry Worldwide
***Source**:* [22]

Online learning has experienced significant growth in recent years. Thanks to the internet, more companies can develop employee skills through self-paced training (see Fig. 2). According to Pappas (2019), the global e-learning market was valued at

$165.36 billion in 2014. It is projected to grow from approximately $250 billion in 2020 to $499.1 billion by 2027 (see Fig. 1), nearly doubling within a decade.

As digital learning adoption accelerates, e-learning has become a vital source of technological advancement. Businesses are expected to increase investments in training budgets, enhancing both employee performance and corporate competitiveness. The shift from traditional to digital learning represents a crucial change in the corporate sector, with the e-learning industry rising to meet this demand.

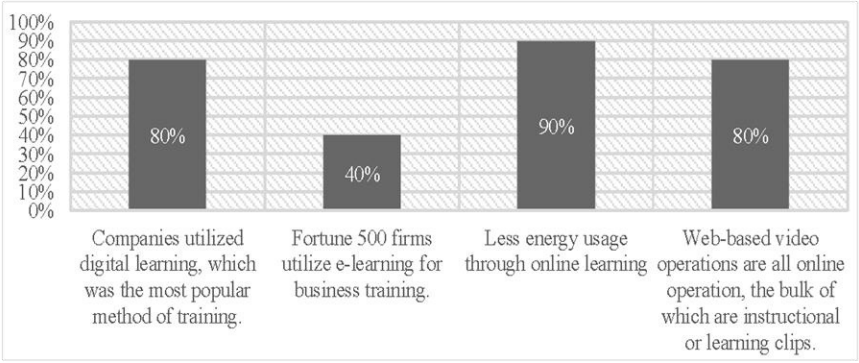

Fig. 2: Key Figures and Trends in Digital Learning in Enterprises (2021)
***Source**:* [23]

The digital sector is forecasted to grow to $320 billion within four years. Revenue trends in the global digital learning market further illustrate this growth. The global market capitalization of digital education and e-learning was $46 billion in 2016 and is projected to reach $243 billion by 2022 [24].

Studies indicate that organizations leverage e-learning to develop employee skills, with over 77% using it to reduce training time and increase effectiveness. As shown in Fig. 2, two out of five Fortune 500 companies utilize e-learning, highlighting a correlation between e-learning adoption and business success.

Nearly 40% of Fortune 500 organizations acknowledge e-learning's efficacy and integrate it into their business models [25].

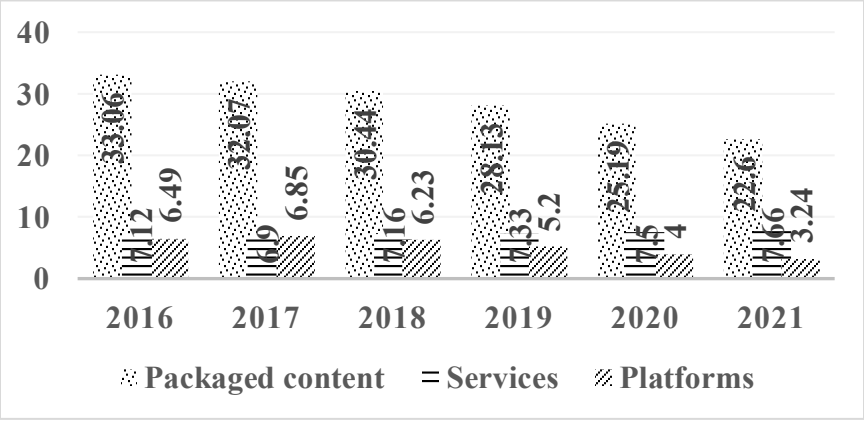

Fig. 3: Global Digital Learning Market Revenue from 2016 to 2021, by Product Category (USD billion)
***Source**:* [24]

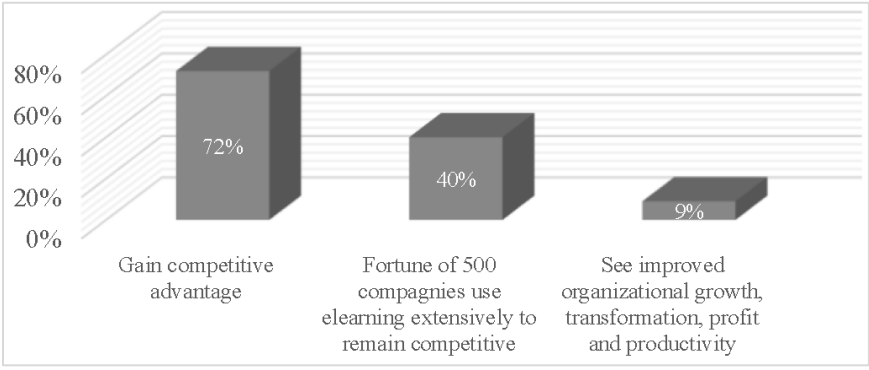

Fig. 4: Impact of E-Learning on Fortune 500 Firms
***Source**:* [26]

A survey by Finance Online (2021) confirms that 10.93% of global enterprises plan to adopt e-learning. This reduces study time by 40–60% compared to traditional methods, allowing employees to focus on core tasks and reducing the need for substitutes. For example, IBM saved $200 million through e-learning adoption

[26]. Beyond convenience and cost savings, e-learning drives revenue growth, with companies using it experiencing higher revenue growth than those that do not [26].

As shown in Fig. 4, e-learning provides a competitive advantage for up to 40% of companies. The American Heart Association (2021) reports that e-learning improves worker productivity by 15–25%, while IBM finds that every dollar spent on e-learning yields $30 in productivity gains [21]. E-learning enhances employee productivity by enabling quicker application of new skills and reducing managerial involvement in training.

Additionally, 58% of workers prefer learning at their own pace from home [27], underscoring e-learning's flexibility. Cost reductions are another benefit, as e-learning minimizes expenses related to trainers, travel, accommodation, and facilities—particularly valuable for geographically dispersed teams.

E-learning improves knowledge retention by 25–60%, compared to 8–10% for traditional training [26]. It gives employees greater control over their learning, allowing them to revisit materials or retake quizzes as needed, reducing pressure and enhancing focus.

Table 1: Inventory and Analysis of Global E-Learning Usage, Impacts, and Perspectives (2021)

Data on the actual use of e-learning in organizations	**Impact on employees and companies**	**The future of e-learning**
Workers take 130% longer to learn	159% increase in CEOs who supervise training and human development in their organizations	33% of training providers plan to focus on interactive training in the near future
75% of staff would prefer video-based learning to	According to 66% of training providers, e-	30% of learning analytics will tie

Data on the actual use of e-learning in organizations	**Impact on employees and companies**	**The future of e-learning**
lecture-based learning	learning is emerging as a key component of businesses.	performance with the knowledge level of participants
91% of companies already give precedence to digital classrooms/webinar presentation competencies prior to Covid-19	41.7% of businesses achieve significant reductions in training costs through the application of a learning management system (LMS).	Worker training support will be available for 50% of businesses as well as for clients requiring additional information.
68% of workers favour learning at their own job sites.	The learning platform, a solution that is configurable, customizable and deployable in days, has integrated program enhancement features that facilitate the production and distribution of relevant programs for various audience types and levels.	In this third age of learning, artificial intelligence will drive learning and training, which will include more personalization and moderation.
74% of staff access digital resources from their cell phones to do their work.	The workforce engaged in active training generates almost three times more profit per unit than its unengaged competitors who do not offer regular training.	Many are calling for a newer learning system based not just on training systems, but also for exponentially changing interactive learning practices.

***Source**:* ([28], [29], [30], [31], [32], [33], [34])

Case Study of US Companies

Keegan (2021) shows that the United States dominates the global e-learning market, with 70% of the industry based in the US or Europe. In 2017, 77% of US companies utilized e-learning [35]. The US e-learning industry is expected to grow by $6.22 billion between 2017 and 2022 [36]. By 2023, 98% of companies plan to incorporate e-learning into their curricula, up from just 4% in 1995 [26]. This growth is driven by increased awareness of e-learning's impact and its ability to accelerate employee training. With rising smartphone adoption, 67% of US companies offered mobile learning options in 2019 (see Fig. 5).

The US e-learning industry is projected to generate $21.64 billion in revenue from 2020 to 2024, with a 12% compound annual growth rate [36]. As shown in Fig. 5, the content segment dominates the US market with a 60% share, followed by technology and services.

The US federal government is also a major consumer of e-learning, purchasing $2.2 billion in self-paced programs in 2019 [22]. Continued investment in digital tools reflects the growing importance of e-learning.

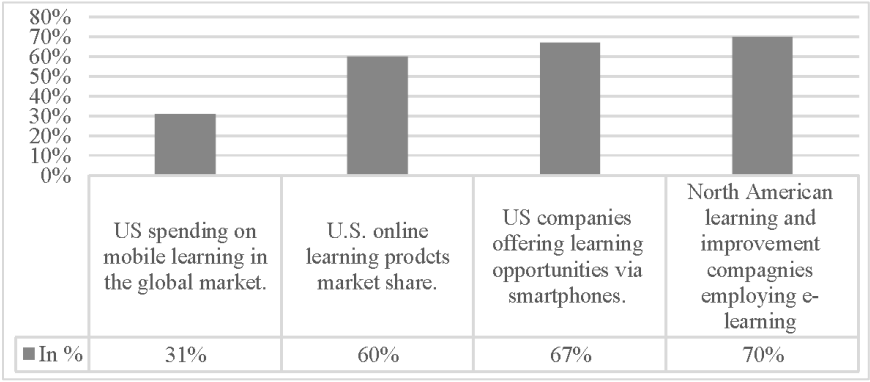

Fig. 5: Key Data on E-Learning in US Companies (2019–2020)
Source:([26], [36], [37])

E-learning provides US businesses with accessible training and development opportunities. Its convenience and practicality support the evolution of corporate learning environments. E-learning has become essential for US corporations and globally, offering seamless integration into workflows and improving knowledge retention and implementation.

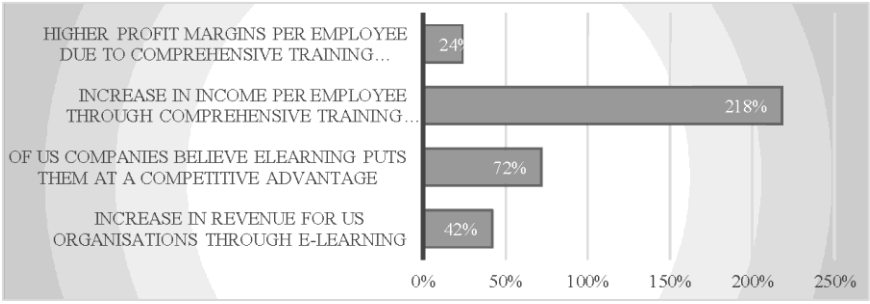

Fig. 6: Benefits of E-Learning in US Companies (2019–2020)
Source: ([36], [26])

E-learning offers unique advantages over traditional training. As shown in Fig. 6, 42% of US organizations report increased revenue due to e-learning, and 50% capitalize on its potential gains [26]. The American Society for Training and Development found that companies with comprehensive training plans achieve 218% higher revenue per employee and 24% higher profit margins (see Fig. 6).

Corporate digital learning encompasses online training modules, articles, sales training, hiring seminars, and tutorials. Over time, it has transcended the limitations of traditional classroom training, which is often costly and time-consuming.

However, on average, only 1% of the workweek is dedicated to training and development [36]. This highlights the need for organizations to maximize training efficiency and outcomes.

Additionally, 70% of training staff report pressure from management to evaluate e-learning effects. While 96% of

participants express interest in evaluation, only 50% assess e-learning in terms of ROI, organizational impact, and workplace effectiveness [38]. Only 14% of learning and development (L&D) professionals consider themselves effective at evaluating digital learning impact, 53% view their evaluations as inefficient, and 33% do not assess e-learning value at all [38].

Furthermore, 83% of L&D professionals indicate CEO support for staff training, but only 27% report their executives as effective supporters of online training [34]. According to Learning Technologies (2019), 48% of companies believe their corporate culture does not support social e-learning, and only 23% of training staff feel equipped to implement group e-learning.

DISCUSSION

Digital Learning vs. Digital Transformation

Employee development has emerged as a strategic tool for business growth, with online learning offering an affordable and accessible means of training. Results from digital e-learning in companies, particularly in the US, demonstrate that adopting e-learning aligns with digital transformation trends and yields competitive advantages.

However, several barriers persist: insufficient training time dedicated to digital learning, lack of CEO support for e-learning, organizational cultures unsupportive of e-learning, and inadequate measurement of e-learning outcomes. Many companies fail to measure e-learning impact, and when they do, methods are often ineffective.

Theoretical and practical analyses suggest the following recommendations:

1. Implement a Digital Culture: Integrate digital culture into corporate policy by involving digital professionals to provide e-

learning across all functions. CEO support is crucial for driving digital transformation.

2. Replace Traditional Training with E-Learning: Develop a well-structured e-learning plan with adequate time and resources.

3. Collaborate with Reputable Digital Providers: Partner with established digital companies to create tailored e-learning programs for employees at all levels.

4. Offer Periodic Professional Development: Provide ongoing programs to strengthen employee digital competencies.

5. Establish a Dedicated Digital Function: Create a role to mediate between e-learning platforms and company departments, ensuring quality human resource development.

6. Measure E-Learning Impact: Although challenging, measuring impact is essential. Companies can track trained employees' productivity changes and compare them to pre-e-learning performance (see Fig. 7).

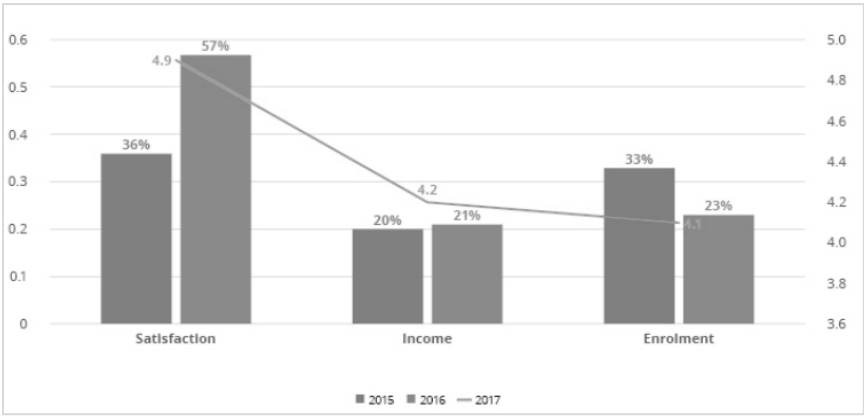

Fig. 7: Practical Example of E-Learning Impact Measured by Course Creators*
***Source**:* [22]

In a digitalized world, companies must invest in e-learning to

prepare for digital transformation. However, resistance to change, legacy learning methods, and uncertainty about investment levels and durations pose challenges. The transition from traditional to digital learning is time-consuming but vital for companies in the digital age.

CONCLUSION AND FUTURE RESEARCH

In today's fast-paced world, technologies and knowledge can become obsolete quickly. This rapid change underscores why the e-learning industry remains highly active. The digital learning environment is a critical partner in preparing industries and businesses for digital transformation. Analysis of multiple studies and statistics in this article confirms this reality, indicating that e-learning adoption is expected to accelerate further. Furthermore, the introduction of ICTs affects not only teaching and learning processes, but also organizational innovation and knowledge management practices aimed at reducing conflicts and improving institutional efficiency. [40]. In addition, flexible forms of online education improve access to entrepreneurial knowledge and help individuals continuously develop professional and digital skills needed in modern innovation-oriented economies. They also encourage lifelong learning, strengthen entrepreneurial self-confidence and adaptability, and facilitate participation in global digital business environments [41.

While this study explores the impact of digital learning on digital transformation, several avenues for future research remain:

- How does digital transformation impact specific company functions, and what is e-learning's role in this process for each function?

- What impact will digital learning have on academic sectors?

- Which e-learning skills should be developed to foster digital

transformation, and how can they be cultivated?

- What are the perceived challenges of digital transformation in organizations?

These questions represent limitations of this study and should be addressed through new opportunities and trends in digital innovation.

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