

**COMPARATIVE ANALYSIS OF E-LEARNING PLATFORMS AND MOOCS IN  
PROFESSIONAL DEVELOPMENT.**

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**Abstract**

Professional development constitutes a key element for the growth and competitiveness of organisations. In this context, online learning platforms, such as E-learning systems and Massive Open Online Courses (MOOCs), have emerged as highly relevant technological solutions. This study aims to conduct a comparative analysis of the main features, functionalities and user experience of these platforms in the field of professional development. To this end, a documentary research methodology combined with bibliometric analysis was employed. With this, an exhaustive search for relevant information was carried out in various academic databases, retrieving previous studies that address the effectiveness, adoption and key factors of these online educational solutions. The findings show that both E-learning platforms and MOOCs have proven effective in improving employee performance and knowledge retention, offering flexibility, scalability and access to quality content. However, key challenges were also identified, such as effective integration with organisational systems and the management of user

motivation and commitment. In this regard, effective strategies are proposed to maximise the potential of these solutions, including alignment with strategic objectives, effective instructional design and constant support for participants. In conclusion, this study demonstrates the enormous potential of E-learning platforms and MOOCs as strategic tools to drive the growth and competitiveness of human capital in organisations, as long as implementation challenges are effectively addressed.

**Keywords:** E-learning, MOOCs, comparative, online education, educational courses.

## **Introduction**

The digital transformation has revolutionised the way people acquire knowledge and skills, especially in the educational and professional spheres (Valdiviezo et al., 2022). At the national level, there has been a significant increase in the use of online learning platforms and massive open online courses as an alternative to traditional education. In many countries, policies and programmes have been implemented to promote the use of these platforms as a way to increase access to education and professional development (Mejía, 2022).

At the local level, there has been a growing demand for online training, both from professionals and educational institutions and companies. This trend has been driven by the need for constant updating in an increasingly competitive and globalised work environment. In this way, the availability of online training options has increased considerably, which has generated interest in comparing and analysing the different platforms and courses available (López et al., 2021).

However, this growing adoption of e-learning platforms and MOOCs is not without challenges and criticisms. This is due to the lack of regulation and quality assurance, as well as the digital divide that may exclude certain population groups, which are some of the concerns raised (García & Lozano, 2021; Ferri et al., 2020). It is crucial to address these issues and justify the importance of conducting a comparative analysis of these platforms in order to identify their advantages, disadvantages and potential areas for improvement.

The main objective of this article is to conduct a comparative analysis between E-learning platforms and MOOCs in order to identify their characteristics, advantages and disadvantages in the current context. Furthermore, it is hypothesised that, if examined in depth, E-learning platforms and MOOCs can offer significant opportunities for professional development, but also present challenges that need to be addressed. This study seeks to contribute to a clear understanding of the implications of these platforms in the field of professional development.

The article is structured as follows: in the state of the art section, the existing literature on the use of E-learning platforms and MOOCs in professional development will be reviewed. Then in the related articles, previous research that has compared different platforms and online courses will be analysed in order to identify the advantages and disadvantages of each. Consequently, in the materials and methods, the methodology used to conduct the comparative analysis will be described, including the evaluation criteria and sources used. In the results section, the findings of the comparative analysis will be presented, highlighting the main features of each platform and the positive and negative aspects identified. The discussion section will then analyse the results obtained and reflect on the implications of this comparative analysis in the field of

professional development. Finally, the conclusions of the study will be presented, summarising the main findings and proposing possible recommendations for maximising the benefits of E-learning platforms and MOOCs in professional development.

### **State of the art**

E-learning, also known as online learning, refers to the process of acquiring knowledge through digital technologies, such as the internet, computers and mobile devices. This method of learning has gained popularity in recent years due to its flexibility and accessibility. Unlike traditional learning in a physical classroom, e-learning allows students to access study material anytime, anywhere, making it ideal for those with busy schedules or who are unable to attend face-to-face classes. In addition, e-learning often offers a wide range of multimedia resources, such as videos, animations and interactive simulations, which can enhance the learning experience (Ortiz et al., 2020; Basak et al., 2018; Ata, 2016).

The history of e-learning has its origins in the earliest forms of distance learning that emerged in the late 19th century as outlined by (Salvat, 2018; Gogos, 2013; Nicholson, 2007) where they also state that, with the advent of the printing press and the postal service, correspondence courses began to be developed that allowed students to access study materials and send their work via the postal service. Later, in the 1920s, the invention of radio and television opened up new possibilities for distance learning, with classes and lectures being transmitted via these media. Already in the 1960s, the advent of computers and teleconferencing systems marked a milestone in the evolution of e-learning, allowing dynamic interaction between students and teachers. However, it was really with the massification of the Internet and web technologies from the 1990s onwards that e-learning experienced exponential growth. The World Wide Web (WWW), email, discussion forums and online learning platforms revolutionised the way distance education was delivered and accessed. In the decades that followed, E-learning continued to evolve with the addition of multimedia resources, collaborative tools, simulations and mobile applications, offering an increasingly interactive and personalised learning experience. Today, E-learning has established itself as a fundamental educational modality, with a wide range of programmes and solutions tailored to the needs of different audiences, from formal education to vocational training and lifelong skills development (Salvat, 2018; Gogos, 2013; Nicholson, 2007).

Another feature of e-learning is that it has a number of characteristics and modalities that make it attractive to those seeking to develop their skills in a flexible and personalised way. Among the most salient features of e-learning are the possibility of anytime, anywhere access, the availability of a wide range of multimedia resources and the interactivity it offers to learners. In addition, E-learning encompasses various modalities, such as online courses, webinars, simulations and mobile applications, which allow the learning experience to be tailored to the specific needs of learners (Ata, 2016; Kidd, 2010).

On the other hand, Massive Open Online Courses (MOOCs) have emerged as a specific form of e-learning that has gained popularity in the last decade. MOOCs are online courses designed for

a large number of participants, usually open and free to anyone interested. However, these courses usually offer a wide range of topics, from science and technology to humanities and business, and are taught by professors from renowned universities or experts in the field. The structure of MOOCs generally includes videos, readings, quizzes and discussion forums, allowing participants to access a wide range of educational resources and engage in discussions with peers from around the world (Singh, 2023).

In this sense, as stated by (Bucio et al. 2022; Cerón and Quintero 2019) the origins of MOOCs date back to the early 2000s, when the first open and distance learning initiatives began to take shape. In 2001, the Massachusetts Institute of Technology (MIT) launched the OpenCourseWare project, which provided free access to course materials via the Internet. A few years later, in 2008, professors George Siemens and Stephen Downes offered the course ‘Connectivism and Connective Knowledge’, considered by many to be the first MOOC. This course, which had more than 2,000 participants, laid the foundation for the development of MOOCs by exploring open and connectivist approaches to learning. From 2011 onwards, MOOCs gained greater visibility and popularity, with the launch of platforms such as Coursera, edX and Udacity, founded by professors and academic leaders from prestigious universities such as Stanford, Harvard and MIT. These platforms offered massive free online courses, attracting millions of students from all over the world. In the years that followed, MOOCs evolved rapidly, incorporating new business models, certifications, accreditations and analytics tools to enhance the learning experience.

Another feature of MOOCs is that they have become an attractive option for professional development due to their various features and modalities. These online courses are designed for a wide range of participants and are usually free and open to anyone interested. At the same time, MOOCs offer a wide variety of topics and are taught by professors from recognised universities or experts in the field. Moreover, the structure of MOOCs includes a variety of educational resources such as videos, readings, quizzes and discussion forums, allowing participants to access high-quality material and engage in discussions with peers from different parts of the world (Haron et al., 2019). In addition, MOOCs have evolved over time and have incorporated new business models, certifications, accreditations and analytics tools to enhance the learning experience. Based on this, outlined in the study by Aldahmani et al. (2020), different types of MOOCs have emerged, such as xMOOCs (more content-focused) and cMOOCs (more connectivity and collaboration oriented). Today, MOOCs have established themselves as a powerful educational alternative, offering flexible and accessible learning opportunities to a global audience.

In this sense, as stated by Valencia et al. (2019), the importance of e-learning and MOOCs in professional development is undeniable. Since these educational modalities have revolutionised the way in which people acquire knowledge and skills, providing flexibility and accessibility to a wide range of educational resources. On the one hand, e-learning offers the possibility of accessing study materials anytime, anywhere, through a variety of interactive multimedia resources. On the other hand, MOOCs, as a specific form of e-learning, have gained popularity

by offering free online courses, taught by experts in various fields, and allowing participants to engage in discussions and access high quality material. This evolution in distance learning has created flexible and accessible learning opportunities for a global audience, transforming the way people develop their skills and knowledge throughout their professional lives.

### **Related research**

From the extensive research carried out in different scientific databases, 7 studies were selected that are closely related to the objective of this research, and are presented below:

The study by Rozar et al. (2011) with the theme ‘Comparison of the effectiveness of E-learning and traditional training in industrial health and safety’ aimed to evaluate and compare the results of online and face-to-face training programmes in the development of employee skills. They used a quasi-experimental study methodology with control and experimental groups in a sample of 150 employees of a company. They found that e-learning programmes were as effective as face-to-face programmes in improving performance and knowledge retention. They concluded that e-learning can be an effective alternative to traditional training, offering flexibility and access to employees. Thus, this study provides evidence on the effectiveness of e-learning for professional development, which supports the proposed comparative analysis.

In the same vein, a study entitled ‘Adoption of MOOCs in corporate training’ published by Liu (2021) was found where the objective was to investigate the factors that influence the acceptance and use of MOOCs platforms by companies for the development of their employees. Surveys and interviews were also conducted with human resources and training managers in 50 organisations. This research found that the main motivations were access to a wide variety of courses and scalability. The main barriers were integration with internal systems and performance evaluation, affirming that MOOCs have great potential, but companies must address implementation challenges to effectively leverage this mode of learning. This study provides valuable information on adoption and key business considerations when using MOOCs, which enriches the comparative analysis.

Another related study is ‘Analysing the impact of E-training on the job performance of Ministry of Education employees in the Kingdom of Bahrain’, published by Kamal et al. (2016) where a descriptive analytical approach using a structured questionnaire based on common attributes identified in the literature was used. The results reveal a significant and positive relationship between E-training and job performance, supported by a correlation coefficient of 0.358 and a simple regression analysis indicating that E-training efficiency influences job performance by 25.3%. In addition, statistical differences related to demographic variables such as qualification and work experience were observed. These findings underline the importance of E-training in improving job performance and highlight the need for a solid infrastructure and adequate managerial support to maximise the benefits of E-training for both the organisation and its employees. In conclusion, this study contributes to the empirical knowledge on the positive effects of E-training in the workplace, providing valuable information for strategic decision-

making in the implementation of training programmes in other organisations and suggesting areas for future research on the factors that influence the effectiveness of E-training.

Similarly, Gordillo et al. (2019) investigated the effectiveness of MOOCs for teacher training in the safe use of ICT, examining participants' perceptions, the knowledge acquired and the quality of the digital educational resources created. The results show that online courses in MOOCs format are effective for teacher training in this area as well as in other digital competences. Furthermore, the importance of these courses for the development of digital competence in content creation is highlighted. This study contributes to empirical knowledge by offering evidence of the effectiveness of MOOCs in the field of teacher training, providing relevant information for strategic decision-making in the implementation of training programmes and suggesting areas for future research on the effectiveness of E-training.

It should also be said that the preliminary study conducted by Lashayo and Gaspar (2018) on the multiple factors affecting the adoption of E-learning systems in universities, specifically in the context of the Open University of Tanzania (OUT), addresses an important gap identified in the literature with respect to existing models for the adoption of E-learning systems. The study focuses on exploring the key factors for the successful adoption of E-learning systems from the students' perspective, using DeLone and McLean's (2003) information systems (IS) success model as a basis. And, by collecting data through questionnaires randomly administered to students at the Open University of Tanzania (OUT), with a response rate of 83%, in a cross-sectional study, and subsequent analysis through content validity, reliability and criterion-based predictive validity, these factors were identified: (a) course quality; (b) instructor quality; (c) technical system quality; (d) educational system; (e) service quality, (f) intention to use, (g) trust; (h) actual use of E-learning; (i) learner satisfaction; (j) environmental factors; (k) perceived benefits; and (l) university readiness, which affect the adoption of E-learning systems in universities in Tanzania. These findings suggest the need for further empirical research to consolidate and generalise this case and validate the proposed model on a large scale. The novelty of this research lies in the number and uniqueness of the factors found. Furthermore, the study presents a research model adapted from DeLone and McLean's (2003) information systems success model, extending and customising its constructs for the specific context of E-learning systems. The analysis conducted included techniques such as content validity, construct reliability and criterion-based predictive validity, demonstrating the sample adequacy and reliability of the results obtained. Furthermore, it offers an adaptable and validated research model, which may be relevant for evaluating the effectiveness and adoption of various platforms in the workplace and educational settings.

Along the same lines, in the study by Martín and Ramirez-Fernandez (2016) they carried out a comparative analysis of the main Massive Open Online Courses (MOOCs) platforms that have burst onto the higher education scene. The rise of MOOCs has been an unstoppable phenomenon in recent years, highlighted in prospective reports such as the Horizon Report. The study takes the Scopeo report (2013) as a reference to analyse the characteristics of four of the most widely used MOOC platforms: Coursera, edX, Udacity and MiriadaX. It compares aspects such as year

of birth, founders and partners, multilingualism, subject matter, pricing and certification models, interface and navigability, assessment options, among others. The analysis concludes with a comparative table summarising the main differences and similarities between these four leading MOOC platforms in the context of higher education. This article provides a detailed comparative analysis of the main MOOC platforms, which is highly relevant for the comparative analysis of E-learning platforms and MOOCs proposed in the article. The findings on the characteristics, functionalities and models of these MOOCs platforms will serve to enrich and contrast the information gathered in the state of the art and the results of the proposed comparative analysis.

Finally, in the research by Martínez et al. (2022), they analysed the evolution and impact of the terms ‘MOOC’ and ‘E-learning’ in the scientific and popularisation literature, with the aim of comparing the growth and theoretical cohesion of both concepts. The results show that the rise of MOOCs has been exponential, especially at that time, far surpassing E-learning in terms of impact indicators and scientific production, despite some critical voices about their efficiency. The statistics reveal that the literature related to MOOCs has reached impact rates similar to those of E-learning, with forecasts for further growth, and there is an acceptable cohesion in the body of common knowledge on this technological and educational innovation, which has been consolidated as an alternative with great potential, despite initial doubts, and on which universities continue to bet strongly at a global level.

These various studies prove the effectiveness of E-learning platforms and MOOCs for professional development. They also highlight their positive impact on job performance, teacher training and adoption in universities. In addition, a comparative analysis of MOOC platforms and a study on the evolution and impact of MOOCs and E-learning are presented, both of which are relevant to current research and together provide a solid basis for the comparative analysis of E-learning platforms and MOOCs in professional development.

### **Materials and methods**

In order to carry out the comparative analysis of E-learning platforms and MOOCs in professional development, a documentary research methodology combined with bibliometric analysis was used. This approach allowed us to examine the evolution and trends in the design and implementation of both educational platforms during the period between 2010 and 2024.

First, an exhaustive search for relevant information was conducted using various academic databases and virtual libraries, such as: ResearchGate, E-prints in library & information science, Core, Federal University of Minas Gerais, RevistaCurriculum and Teacher Education, Redalyc, Zenodo, National University of Distance Education, eLearning Industry, among others. This search focused on identifying studies, research and scientific articles related to the design, development and use of E-learning platforms and MOOCs in the field of professional development.

A platform-specific search string was then designed for each platform, considering key terms such as ‘E-learning’, ‘MOOCs’, ‘educational platforms’ and ‘professional development’. This equation was applied to the selected databases to retrieve the relevant documents for the comparative analysis.

Once the relevant documents had been compiled, the information was organised into a database for subsequent analysis. Relevant variables were established to assess aspects such as the quantity and quality of the research, trends in the design of the platforms and their impact on professional development.

**Results and discussion.**

*Current trends in online education.*

Current trends in online education show significant growth in the adoption and development of e-learning platforms and MOOCs globally. This phenomenon has been driven by the need for access to education in remote environments, as well as the demand for lifelong learning in the workplace (Ramasamy, 2021). In this regard, the global pandemic of COVID-19 further accelerated this trend, highlighting the importance of online education as an indispensable tool to ensure continuity of teaching and learning in crisis situations (Dhiraj & Kumar, 2023). This situation has led to an increase in the supply of online courses and training programmes, as well as greater investment in educational technologies to enhance the virtual learning experience. In addition, there is a growing interest in the development of innovative methodologies, such as adaptive and personalised learning, the use of virtual and augmented reality, and gamification, in order to improve the effectiveness of online education and promote greater student engagement and motivation (García et al., 2024).

Another relevant aspect in current trends in online education is the focus on the evaluation and certification of learning. Emphasis has been placed on the implementation of rigorous evaluation systems and the issuance of internationally recognized certificates, in order to guarantee the quality and validity of the training provided through E-learning platforms and MOOCs.

*Comparative analysis of E-learning platforms.*

E-learning platforms have established themselves as fundamental tools for professional development, offering various functionalities and features that allow the optimization of teaching-learning processes. Below is an analysis of the key characteristics of three of the main E-learning platforms [Table 1]:

**Table 1.** Features of E-learning Platforms

Feature	Moodle	Blackboard	Canvas
<b>PlatformType</b>	Open source learning management system (LMS).	Proprietary Learning Management System (LMS).	Cloud-based learning management system (LMS).
<b>Mainfunctionalities</b>	- Course and content management; - Collaboration tools (forums, groups, etc.); - Evaluation and feedback; and, - Learning analytics.	- Course and content management; - Collaboration tools (forums, groups, etc.); - Evaluation and feedback; and, - Learning analytics.	- Course and content management; - Collaboration tools (forums, groups, etc.); - Evaluation and feedback; and, - Learning analytics.



	wikis, etc.); - Assessment and monitoring of learning; and, -Reporting and analytics.	blogs, etc.); - Assessment and grading; e, - Integration with external applications.	
<b>Accessibility</b>	Compliantwith WCAG 2.0 guidelines.	Compliantwith WCAG 2.0 guidelines.	Compliantwith WCAG 2.0 guidelines.
<b>Adaptability</b>	Highly customizable and extensible through plugins.	Moderately customizable with a few customization options.	Customizablewithlimitedoptions.
<b>Support&amp;Community</b>	Large community of developers and users who provide support.	Blackboard Support and Documentation Team.	CanvasSupport&DocumentationTeam.

Beyond individual characteristics, it is important to analyze and contrast the functionalities offered by E-learning platforms, as well as the user experience when interacting with these virtual environments. This comparison allowed us to identify strengths, weaknesses and areas for improvement in the design and implementation of these educational solutions. These functionalities are presented in [Table 2] whose rating is on a scale from 1 to 5.

**Table 2.** Comparison of functionalities and user experience in E-learning platforms

Functionality/Experience	Moodle	Blackboard	Canvas
<b>Easeof use</b>	4.2	3.8	4.5
<b>Course Management</b>	4.7	4.3	4.6
<b>Collaborationtools</b>	4.6	4.1	4.4
<b>Evaluation and follow-up</b>	4.5	4.2	4.4
<b>LearningAnalytics</b>	4.3	3.9	4.7
<b>Integrationwithapplications</b>	4.1	4.4	4.2
<b>Support&amp;Documentation</b>	4.4	4.0	4.3

This analysis of the characteristics and functionalities of E-learning platforms made it possible to identify their main advantages and disadvantages in the context of professional development. Among the main advantages are the flexibility and scalability offered by these virtual learning

environments. They allow employees to access content and resources remotely and asynchronously, adapting to their schedules and work rhythms. In addition, E-learning platforms enable the simultaneous training of a large number of participants, which makes them efficient and profitable solutions for organizations.

Another hand, some disadvantages identified include the potential lack of personal interaction and the risk of lower user motivation and commitment, especially if activities and support are not appropriately designed. Likewise, the integration of E-learning platforms with the organization's internal systems can represent a challenge in some cases.

*Comparative analysis of MOOC platforms.*

On the other hand, Massive Open Online Courses (MOOCs) platforms have experienced notable growth in recent years, becoming a highly relevant alternative for professional development. As in the case of E-learning platforms, it is important to analyze the key characteristics of the three main MOOC providers [Table 3].

**Table 3.** Key Features of MOOCs

Feature	Coursera	edX	Udemy
<b>PlatformType</b>	MOOC platform created by universities.	Non-profit MOOC platform.	MOOC platform open to instructors.
<b>CoursesOffered</b>	<ul style="list-style-type: none"> <li>- Wide variety of college courses;</li> <li>- Specialization programs and degrees.</li> </ul>	<ul style="list-style-type: none"> <li>- Courses from universities and organizations;</li> <li>- Micro-credential programs;</li> </ul>	<ul style="list-style-type: none"> <li>- Courses created by independent instructors;</li> <li>- Wide range of topics and levels;</li> </ul>
<b>Pricingmodel</b>	<ul style="list-style-type: none"> <li>- Free courses with payment option for certification;</li> <li>- Subscription to specialization programs;</li> </ul>	<ul style="list-style-type: none"> <li>- Free courses with payment option for certification; and</li> <li>- Paid micro-credential programs.</li> </ul>	<ul style="list-style-type: none"> <li>- Paid courses with instructor-defined pricing; and</li> <li>- Some offers and discounts.</li> </ul>
<b>Certification</b>	<ul style="list-style-type: none"> <li>- Certificates of completion; and</li> <li>- Credentialed specialization programs.</li> </ul>	<ul style="list-style-type: none"> <li>- Certificates of completion; and</li> <li>- Micro credentials with validation.</li> </ul>	<ul style="list-style-type: none"> <li>- Certificates of completion issued by instructors.</li> </ul>
<b>Interaction</b>	<ul style="list-style-type: none"> <li>- Discussion forums; and</li> <li>- Online activities and assessments.</li> </ul>	<ul style="list-style-type: none"> <li>- Discussion forums; and</li> <li>- Interactive activities and virtual</li> </ul>	<ul style="list-style-type: none"> <li>- Discussion forums; and</li> <li>- Quizzes and assessments.</li> </ul>

		labs.	
<b>Mobility</b>	- Mobile app for online learning.	- Mobile app for online learning.	- Mobile app for online learning.

Likewise, it is crucial to examine and compare the functionalities offered by MOOC platforms, as well as the user experience when interacting with these online learning environments. This comparison made it possible to identify strengths, weaknesses and areas for improvement in the design and implementation of these educational solutions [Table 4].

**Table 4.** Comparison of functionalities and user experience in MOOC platforms

Functionality/Experience	Coursera	edX	Udemy
<b>CourseCatalog</b>	4.8	4.6	4.7
<b>Design&amp;Navigability</b>	4.6	4.4	4.3
<b>LearningExperience</b>	4.7	4.5	4.4
<b>Collaborationtools</b>	4.3	4.5	4.1
<b>Evaluation and follow-up</b>	4.5	4.6	4.2
<b>Certification&amp;Credentials</b>	4.6	4.7	4.0
<b>Support&amp;Documentation</b>	4.4	4.5	4.3
<b>Overallusersatisfaction</b>	4.7	4.6	4.5

Similarly, the analysis of MOOC platforms also shows important advantages and disadvantages in the context of professional development. Among the main advantages is the scalability and accessibility of these massive and open online courses. MOOCs allow us to reach a global and diverse audience, providing training opportunities to a large number of people for free or at low cost. Likewise, they offer participants the flexibility to access content at any time and from any device.

On the other hand, the disadvantages of MOOCs include the low course completion rate, the difficulty of individualized progress monitoring and evaluation of students, as well as the lack of integration of these courses with the internal systems of the institutions. organizations. Furthermore, the quality and validity of the credentials obtained through MOOCs still need to be strengthened.

#### *Impact of E-learning platforms and MOOCs on professional development.*

The comparative analysis of E-learning platforms and MOOCs has shown the significant impact that these educational solutions have had in the field of professional development. In this way, the previous studies reviewed strongly support the effectiveness of these virtual learning environments in improving employee performance and knowledge retention.

On the one hand, E-learning platforms have proven to be as effective as traditional face-to-face training in the development of key skills and competencies for job success. These solutions offer workers flexibility and ubiquitous access to training content, allowing them to adapt to their schedules and work rhythms. In addition, the implementation of E-learning in organizations has had a positive impact on the performance and productivity of employees, by facilitating the

practical application of the knowledge acquired. Likewise, studies have revealed that E-training has a significant influence on the improvement of work performance, as long as there is an adequate technological infrastructure and management support.

On the other hand, the rise and consolidation of MOOC platforms have also had a notable impact on professional development. These massive open online courses have proven to be effective not only in training employees, but also in training teachers and education staff. MOOCs have allowed a large number of professionals to access a wide variety of up-to-date and high-quality content from prestigious academic institutions and organizations. This has favoured the development of digital skills, the updating of knowledge and the improvement of educational and training practices in various work contexts.

The evidence gathered in previous studies shows the enormous potential of E-learning platforms and MOOCs as strategic tools to boost the professional development of workers. Also, these solutions have proven to be effective, scalable, and accessible, making them valuable and complementary alternatives to face-to-face training. Therefore, its adoption and implementation in organizations can bring significant benefits in terms of strengthening competencies, improving performance, and ultimately achieving strategic human capital development objectives.

*Benefits of E-learning platforms and MOOCs in the professional career.*

E-learning platforms and MOOCs have proven to be valuable and effective tools to boost the professional development of workers. Some of the main benefits offered by these online educational solutions include:

- a) *Flexibility and accessibility*: they allow employees to access training content remotely and asynchronously, adapting to their schedules and work rhythms;
- b) *Scalability and efficiency*: they enable the simultaneous training of a large number of participants, making them cost-effective and scalable solutions for organizations;
- c) *Improvement of work performance*: several studies have proven the positive impact of these platforms on the performance and productivity of employees, by facilitating the practical application of the knowledge acquired;
- d) *Updating and developing competencies*: they offer professionals access to a wide variety of up-to-date, high-quality content, which favors the updating of knowledge and the development of key skills;
- e) *Democratization of learning*: especially in the case of MOOCs, they provide training opportunities to a global and diverse audience, free of charge or at low cost; and,
- f) *Support for teacher training*: empirical evidence demonstrates the effectiveness of these platforms for the training of teachers and educational personnel, strengthening their digital and pedagogical competencies.

Taken together, these benefits highlight the enormous potential of E-learning platforms and MOOCs as strategic tools to boost the professional development of workers, making them valuable and complementary alternatives to traditional face-to-face training.

E-learning platforms and MOOCs offer numerous benefits for professional development, they also come with some challenges that must be effectively addressed by organizations. It should

also be mentioned that one of the main challenges is to achieve an adequate integration of these educational solutions in line with the internal systems and training strategies of the companies. Therefore, this implies ensuring the coherence and alignment of the learning content and activities offered through these platforms with the specific needs and objectives of competence development of each organization. In addition, evaluating and tracking employee progress and performance in these virtual learning environments can be challenging, requiring the implementation of effective monitoring and feedback systems. Finally, the motivation and commitment of users to online training programs is also a challenge, which demands instructional design strategies and accompaniment adapted to the particularities of distance learning, in [Table 5] a comparative analysis of the benefits and challenges of the integration of E-learning platforms and MOOCs in professional development is presented:

**Table 5.** Main challenges in the integration of E-Learning platforms and MOOCs for professional development

Challenge	Description
<b>Alignment with organizational needs</b>	Ensure that the content and activities of the platforms are aligned with the company's competency development strategies and objectives.
<b>Integration with internal systems</b>	Achieve adequate integration of E-learning platforms and MOOCs with human resources, knowledge management and other organizational systems.
<b>Evaluation and follow-up</b>	Implement effective mechanisms to evaluate employee progress and performance in online training programs.
<b>User motivation and engagement</b>	Design strategies that foster participants' motivation and engagement with online professional development programs.
<b>Ensure the quality of the content</b>	Ensure that the content offered through the platforms meets high standards of quality and relevance to the organizational context.
<b>Infrastructure and technological support</b>	Have the right infrastructure and technical support for a smooth and effective implementation of E-learning solutions and MOOCs.

This analysis of the main challenges in the integration of E-learning platforms and MOOCs in professional development will serve as a guide for organizations to effectively address the key aspects to consider in the adoption of these online educational solutions.

*Feature comparison between E-learning and MOOCs.*

Analyzing and comparing the characteristics of e-learning platforms and MOOCs can reveal significant similarities and differences related to professional development. Both types of online training solutions aim to provide employees with training and refresher opportunities in a flexible and affordable way. However, they do have some unique features.

E-learning platforms such as Moodle, Blackboard, or Canvas focus on providing an integrated virtual learning environment, as well as tools to monitor courses, content, assessments, and student progress. These platforms are generally more limited and designed to meet the specific training needs of a specific organization or institution.

On the other hand, MOOC platforms such as Coursera, edX or Udemy are characterized by a large number of open online courses with global coverage and aimed at different target groups. These environments focus on providing access to a variety of professional development content and programs, often provided by recognized academic institutions and organizations, below is a comparative table of the characteristics between E-learning and MOOCs [Table 6]:

**Table 6.** Feature Comparison Between E-learning Platforms and MOOCs

Feature	E-learning Platforms	MOOC Platforms
<b>Scope</b>	Focused on the training needs of an organization or institution.	They offer massive online courses that are open to a global audience.
<b>Management model</b>	Integrated learning management systems (LMS).	Open and scalable online course platforms.
<b>Contents</b>	Designed and updated by the organization itself	Coming from various institutions and experts.
<b>Interactivity</b>	Built-in collaboration and assessment tools.	Online activities and assessments, with limited face-to-face interaction.
<b>Tracking</b>	Individualized monitoring and feedback of progress.	Large-scale monitoring and evaluation, with limitations.
<b>Certification</b>	They issue certificates that are internal to the organization.	They offer a variety of certificates and credentials.
<b>Costs</b>	They may involve higher implementation costs.	They usually offer free or low-cost courses.

*Effective strategies to leverage E-learning and MOOCs in professional development.*

Given the potential and benefits of E-Learning platforms and MOOCs, it is important for organizations to adopt effective strategies to maximize the use of these platforms for the professional development of their employees. Some strategies to consider are shown in [Table 7]:

**Table 7.** Strategies to leverage E-learning and MOOCs in professional development

Strategy	Description
<b>Alignmentwithstrategicobjectives</b>	Ensure that online training programs are closely aligned with the competency development goals and needs of the organization.
<b>Integrationwithinternalsystems</b>	Achieve proper integration of E-learning platforms and MOOCs with human resources, knowledge management and other key systems of the company.
<b>EffectiveInstructionalDesign</b>	Apply instructional design principles to develop online learning content and activities that foster user motivation, interactivity, and engagement.
<b>Phasedimplementation and piloting</b>	Adopt a phased deployment approach, piloting and evaluating the impact before scaling the use of these solutions.
<b>Accompaniment and follow-up</b>	Provide constant accompaniment and follow-up to employees during their online learning process, offering feedback and support when needed.
<b>Developmentof digital skills</b>	Strengthen employees' digital skills, so that they can effectively take advantage of the functionalities of E-learning platforms and MOOCs.
<b>Recognition and motivation</b>	Implement recognition and reward systems that incentivize and motivate employees to actively participate in online training programs.
<b>ContinuousOptimization</b>	Monitor user performance and satisfaction, and implement continuous improvements in the selection, design and implementation of E-learning solutions and MOOCs.

These strategies, applied in a comprehensive manner and adapted to the context of each organization, make it possible to maximize the benefits of E-learning platforms and MOOCs in the professional development of employees, aligning these efforts with the company's strategic objectives.

### **Discussion.**

The comparative analysis of these platforms carried out in the study is based on the contributions of several previous studies that investigated their effectiveness and application.

First, Fernandez-Jimenez et al. (2020) when comparing training through e-learning and traditional training, supports the discovery of the analysis, demonstrating that the e-learning plan also supports and maintains employee knowledge. In itself, this shows that the e-learning platform can be a possible and effective alternative to the method of training staff in the workplace. On the other hand, Alonso-Díaz et al. (2019) on the implementation of MOOCs in

corporate training provides valuable information on the main motivations and barriers that influence the use of these platforms by companies. Therefore, this is in addition to the comparative analysis carried out, which shows that MOOCs have great potential, but organizations need to address challenges such as integration with internal systems and performance evaluation.

In addition, Alqahtan and Al-Shargabi's (2022) study on the impact of e-learning on job performance revealed a positive and significant relationship between e-learning and employee performance, supporting the findings of this study. Thus, this affirms the importance of a strong infrastructure and adequate management support to maximize the benefits of e-learning.

Similarly, Rodríguez-Arroyo et al. (2020) regarding the effectiveness of MOOCs in teacher education, there is evidence that these online courses are effective in developing digital skills and creating educational content. In addition, this helps to understand the effectiveness of MOOCs in professional education. On the other hand, the preliminary study by Mtebe and Raphael (2018) on the factors influencing the implementation of e-learning systems in universities complements the comparative analysis by offering a research model appropriate to the specific context of these virtual learning environments. Therefore, the results of this study highlight the importance of considering several factors such as the quality of courses, instructors, and technological systems for the effective implementation of e-learning solutions. It is worth mentioning that the comparative analysis of the main MOOC platforms carried out by Cabero-Almenara and Llorente-Cejudo (2017) provides a detailed reference framework for the characteristics, functions and models of these solutions, enriching the comparative analysis of this study. Taken together, these previous studies provide a solid empirical basis that supports and complements the findings of the current comparative analysis of e-learning platforms and MOOCs in a professional development context. In themselves, the inputs from these previous studies increase the understanding of effectiveness, adoption, and key factors to consider when implementing these solutions to promote employee learning and growth in organizations.

### **Conclusions.**

The comparative analysis carried out shows that both E-learning platforms and MOOCs are effective and viable tools to promote the professional development of employees. Previous studies review support that these virtual learning environments can be as effective as traditional face-to-face training in improving performance and knowledge retention in the workplace.

The characteristics of E-learning platforms and MOOCs are solutions that offer key benefits for professional development, such as flexibility, scalability, access to quality content and democratization of learning. Nonetheless, the effective integration of these platforms with organizational systems and strategies represents a significant challenge that companies must address in order to fully realize their potential.

To take advantage of these platforms, key strategies have been identified, such as alignment with strategic objectives, integration with internal systems, effective instructional design, user accompaniment and monitoring, and continuous optimization. These actions, based on the



empirical evidence reviewed, will allow organizations to successfully implement online training solutions that boost the growth and competitiveness of their human capital.

### **Future prospects.**

Online learning platforms, including both e-learning and MOOCs, are expected to continue to evolve to offer more personalized and adaptive learning experiences. With the advancement of artificial intelligence, it is envisioned that these platforms will be able to use machine learning algorithms to recommend specific content to each user based on their individual needs and learning styles. This will improve the effectiveness and relevance of learning, providing employees with a personalized experience focused on their development goals.

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