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## Research Article

# From Platforms to Online Communication Tools

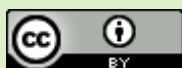
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**Abstract.** In e-learning, the shift from platforms to online communication tools has been significant. As education evolves towards virtual environments, learning platforms become crucial for managing courses, delivering content and assessing learners. The article focuses on various forms of online communication tools, such as discussion forums, live chats and virtual meeting rooms, and explains how these tools facilitate interaction, collaboration and active participation between learners. It also discusses potential obstacles to the integration of these tools. In this contribution, we work with the LMS platform, as the various online communication tools can be found in the LMS platform. Ultimately, the article highlights the importance of combining a robust e-learning platform with appropriate online communication tools to foster an interactive learning environment.

**Keywords:** E-learning, online platforms, online communication Tools synchronous, online communication Tools asynchronous.

## INTRODUCTION

The digital realm has witnessed platforms assume a pivotal function in enabling interaction, disseminating intelligence, and implementing remote pedagogy. However, technology's accelerated progress has also spawned a multitude of online communication tools that complement or potentially replace traditional platforms' functionalities. This transition begets important inquiries regarding how individuals engage, connect, and cooperate within these virtual milieus.

Educational platforms like learning management systems (LMS), content management systems (CMS), and learning content management systems (LCMS) play an indispensable role in facilitating distance learning and overseeing content-centered erudition. Moreover, thanks to innovations' rapid advances, novel online communication tools continue emerging, granting further chances for intercourse, collaboration, and information sharing in virtual settings. This evolution permits users to explore complementary capacities or substitutes for conventional platforms, and poses queries for managers who interact and collaborate in these nascent environments. This article will examine the evolution of LMS, CMS, and LCMS platforms towards online communication tools, surveying the advantages and opportunities provided by these new instruments for online pedagogy and education.

Learning Management Systems (LMS) provide an online classroom experience that enhances the learning journey for both teachers and students. Within the virtual classroom, LMS platforms provide valuable support to facilitate the learning process. By implementing a standard LMS, an inclusive environment is fostered, promoting collaboration, professional growth, discussion and communication between users (Dias & Dinis, 2014; Jung & Huh, 2019; Oakes, 2002). According to Nasser, Cherif and Romanowski (2011), LMS use ensures that online learners receive consistent feedback on their performance. In addition, using the LMS enables online learners to develop their autonomy (Blau & Hameiri, 2010; Nasser et al., 2011; Strayhorn, 2010; Wood et al., 2011). Learner engagement is sustainable because online users use an LMS to track their progress (Al-Fraihat, Joy, Masa'deh, & Sinclair, 2020; Selwyn, Hadjithoma-Garstka S, & Clark, 2011). ). Content Management Systems (CMS) and Learning Content Management Systems (LCMS) play a vital role in managing and delivering educational content. A CMS platform provides a central hub through which teachers and students can access and organize various types of content, such as text, images, and multimedia resources. This facilitates seamless content creation, editing, and publishing, thereby improving the overall learning experience (Chen, 2012; Vlachopoulos & Cowan, 2011). LCMS, on the other hand, specifically caters to the needs of educational institutions by providing specific features for learning material development and management. LCMS platforms enable educators to create interactive and engaging content, customize learning paths, and track student

progress, thereby promoting effective teaching and learning (Chen, 2012; Vlachopoulos & Cowan, 2011).

Both CMS and LCMS systems contribute to establishing a well-structured and organized digital learning environment that supports collaboration, communication, and knowledge sharing (Chen, 2012; Vlachopoulos & Cowan, 2011).

Online communication instruments unveil novel prospects for interaction and collaboration between learners, educators, and stakeholders within the educational process. They transcend the simple exchange of text messages, offering discussion forums, live chats, virtual meeting rooms, internal messaging, blogs, and wikis. These tools empower learners to communicate, share ideas, pose queries, collaborate on projects, and interact synchronously or asynchronously. They additionally proffer adaptability regarding time and place, allowing learners to engage at their own pace, in real time or asynchronously. This opens possibilities for continuous erudition irrespective of temporal or spatial constraints. Integrating these online communication tools into platforms represents a major advancement in e-learning by fostering interactivity, collaboration, and learner involvement, thereby cultivating dynamic and enriching pedagogical milieus. Uniting platforms with these online communication tools unlocks a wealth of chances for interactive and collaborative pedagogy tailored to learners' individual needs. The various online communication tools are available on the LMS platform.

Our work focuses first on the definition of an e-learning platform, as well as the definition of the LMS, CMS and LCMS learning management systems. We then compare the three systems, CMS, LMS and LCMS. In addition, we look at the various online communication tools, both synchronous and asynchronous, examining their advantages and limitations.

### **Definition of an e-learning platform**

Within the realm of information technology, a platform stands as a fundamental structure that supports the creation, consumption, utilization, and enhancement of diverse software applications and websites. It establishes a space where application services can be managed and utilized. A development platform, in particular, is meticulously crafted to simplify the tasks of developers by providing a repertoire of functions that can be executed through variables embedded within HTML pages. Platforms are typically conceived, developed, built, implemented, and upheld by computer manufacturers or service providers. However, in the case of software platforms, it is the organizations responsible for hosting the database and associated software that take charge of their maintenance.

The selection of a suitable platform becomes challenging due to the wide range of options available (with over 20 products) and their continuous evolution, as well as the presence of diverse platform and portal providers (including platforms themselves). The need to effectively organize, present, store, and update these learning experiences has been the driving force behind the development of three enterprise-wide applications:

- Learning Management Systems (LMS)
- Content management systems (CMS)

- Learning content management systems (LCMS)

## **TYPES OF E-LEARNING SYSTEM**

The objective of the distance learning platform is to streamline the administration of distance learning activities (Prat, 2012). These platforms can primarily focus on either managing content or managing skills. In this chapter, we will delve into three different types of applications: learning management systems (LMS), content management systems (CMS), and learning content management systems (LCMS). While these applications share some similarities, they also possess unique features that make them more suitable for specific situations. For example, as organizations increasingly embrace reusable learning objects (RLOs) to facilitate the capture, control, and management of learning materials and information, the optimal storage and management functions for these objects may differ. To provide the necessary context for examining the characteristics of these three applications (Irlbeck & Mowat, 2007), this section will begin with a brief introduction to RLOs.

### **LEARNING MANAGEMENT SYSTEM (LMS)**

In their work, Watson and Watson (2012) have identified computer-aided instruction (CAI), computer-aided teaching (CAE), and computer-aided learning (CAL) as broad terms that encompass the historical adoption of computers. These terms encompass various computer applications, teaching methodologies, and the preparation of instructional materials. Additionally, they encompass activities related to document tracking, approval, and dissemination. For further details and specific definitions of these terms, please refer to the appendix.

According to Jung and Huh (2019), Kuosa et al. (2016), Oakes (2002), and Watson and Watson (2012), an LMS (Learning Management System) encompasses a range of online operations and serves as a framework for facilitating progressive learning across various levels. One key function of an LMS is to act as a platform for distributing and tracking learning materials (Watson & Watson, 2012). The features of an LMS include the provision of information specifically designed to assess learner progress (Oakes, 2002; Watson & Watson, 2012). Additionally, an LMS platform creates an environment that fosters learner engagement and success. Learners can utilize the LMS to register for courses, track their grades, and stay updated with course information and announcements (Al-Fraihat et al., 2020; Oakes, 2002; Watson & Watson, 2012).

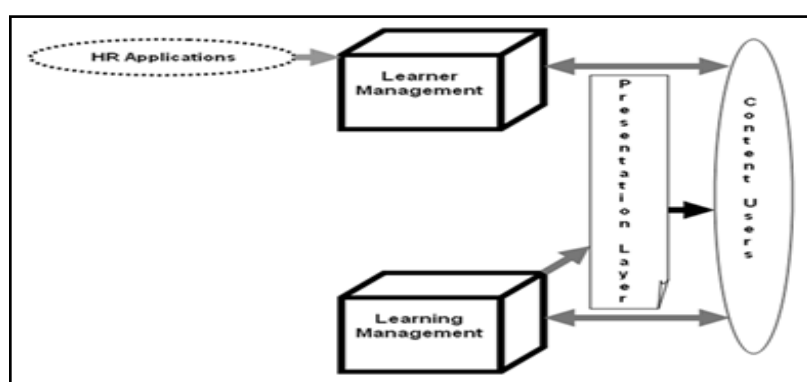
Watson and Watson (2012) recommend that the use of an LMS (Learning Management System) should be a functional requirement when integrating it into school districts. They discuss various administrative management techniques associated with an LMS, including enabling profile features, curriculum tracking guidelines, assignment management, discussion forums, writing resources, and instructor updates. Users of an LMS have the ability to access content and information shared by the instructor, whether in synchronous or asynchronous formats (Jung & Huh, 2019; Kuosa et al., 2016; Watson & Watson, 2012).

Different expressions are used to refer to an LMS, such as e-learning platform, learning management system, virtual training center, and online learning platform

(ODL). In Canadian contexts, the general term digital learning environment (DLE) is commonly used. Examples of LMS platforms include Moodle, Ilias, Chamilo, EDX Claroline, Ganesha, Dokeo, Spiral, Acolad, and Virtual) (Ouariach et al., 2023). The system comprises various components and functionalities, which contribute to its overall functionality and effectiveness:

- Learners belonging to a virtual community;
- An e-learning platform that hosts content developed according to a training strategy, and assessment tools;
- Trainers and/or tutors who deliver the training.

**Figure 1.** The components comprising an LMS (Learning Management System)



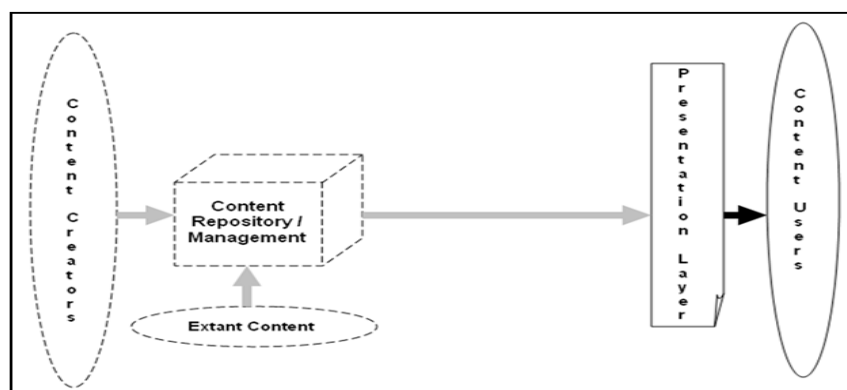
## CONTENT MANAGEMENT SYSTEM (CMS)

A content management system (CMS) can be defined as a set of policies and technologies that enable organizations to contribute, manage, and share their structured and unstructured information (Barnes and Falla, 2001). It is used as a data store and can contain tools for creating, organizing, and grouping content, with the main purpose of simplifying the creation and management of online content (Nichani, 2001). CMS was originally developed for the newspaper industry and later modified in the 1990s to meet the large content requirements of powerful websites. CMS unifies workflows and manages information based on search and retrieval criteria. It supports the reuse of content components, also known as Reusable Learning Objects (RLOs), that can be used multiple times. For example, images can be used in different newspaper articles aimed at different target groups. A content management system effectively organizes and stores files while providing version control and access to data. There are numerous content management systems available, ranging from relatively simple to complex and powerful. Common functions of a CMS include format management, web publishing, indexing, revision control, and search and retrieval. Drupal and WordPress are among the most widely used content management systems.

The accompanying diagram depicts the key components of a standard content management system, highlighting the essential elements known as "blocks" that constitute the content, as well as the process of assembling these blocks. At its core, content is generated in a format that is compatible with the content repository

system. This digital presentation format allows content users to search for and display specific content blocks. Typically, content users do not have the authority to directly modify the content, but they may request revisions from the original creator.

**Figure 2.** The components of a content management system (CMS)



### LEARNING CONTENT MANAGEMENT SYSTEM (LCMS)

A Learning Content Management System (LCMS) is a specialized software platform dedicated to e-learning. It is designed to store, organize, and distribute educational content, primarily used by content managers or administrators. The LCMS serves as a tool for creating and managing educational materials for blended learning approaches. The LCMS acts as a centralized library, allowing for easy searching, identification, and reuse of learning content based on training needs. It incorporates content creation tools that are typically managed by instructional design teams rather than learners. The content creation process takes place within the LCMS platform, which is separate from the Learning Management System (LMS) used by learners.

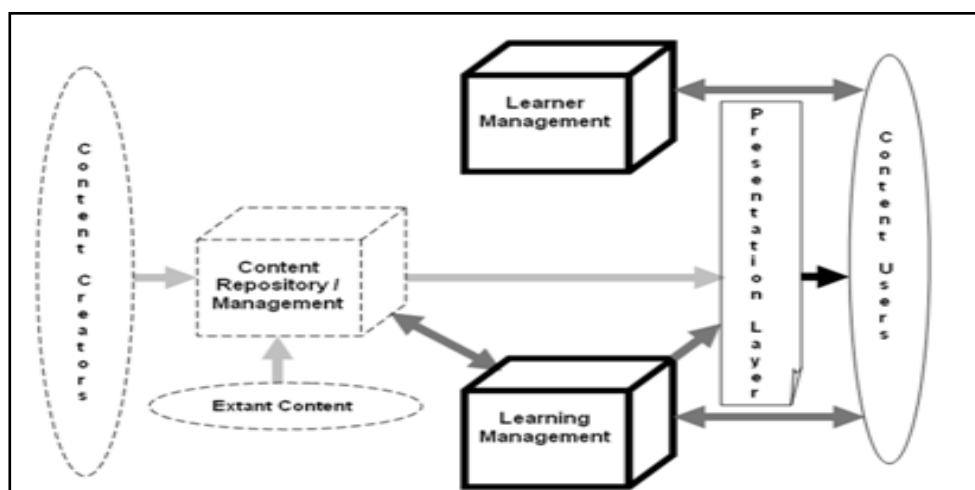
The primary purpose of the LCMS is to facilitate the training of production experts and intervene in the content creation process before it is distributed. By providing integrated database functionality, the LCMS enables storage, management, and reuse of online content in the form of tagged learning objects for blended learning scenarios. It functions as a comprehensive system for organizing and delivering learning content, enhancing efficiency and effectiveness in content management and delivery.

According to Jones (2001), the LCMS is considered a complex software solution. It plays a critical role in organizing and delivering tagged learning objects, which can be easily searched and reused. The LCMS serves as a central repository for learning content and offers content creation tools that are primarily used by instructional design teams. Its focus is on training production experts and intervening in the content creation process before it is distributed to learners.

The main components of an LCMS, according to Donello (2002), include an authoring tool, a dynamic delivery interface, an administrative component and a learning object repository. The latter hosts the content and delivers it individually or combined into modules. Williams (2002) points out that the LCMS meets the

challenges of knowledge management by simplifying tasks such as information entry and course assembly.

**Figure 3.** Learning Content Management Systems (LCMS)



In short, an LCMS supports the creation, storage and management of learning objects, streamlining processes for training departments and improving instructional design. The system consists of various components, including a repository, authoring tools and administrative functions, which contribute to the efficient management and distribution of knowledge.

### COMPARISON BETWEEN THE THREE SYSTEMS CMS, LMS AND LCMS

There is occasionally confusion between Content Management Systems (CMS) and Course Management Systems (CMS). However, CMS are more advanced and encompass a wide range of functionalities such as content delivery, communication, learner activities, collaboration, feedback, testing, portfolio development, groupware tools, and administrative tools for instructors (Collis & Strijker, 2003). While CMS primarily focus on storing and accessing content, they can also be utilized for broader purposes of organizational knowledge management (Robertson, May 2003). On the other hand, the responsibility of analyzing, organizing, and transforming content into knowledge lies with the Learning Management System (LMS) and/or the Learning Content Management System (LCMS).

There are notable distinctions between LMS and LCMS platforms, and the five key differences are as follows:

1. **Learner and content management:** LMS platforms focus on user management, e-learning content delivery, traceability, and learner assessment. In contrast, the SGCA platform focuses on content design and management, creating high-quality e-learning resources without directly monitoring the e-learning experience.
2. **Target users:** APG solutions are used by e-learning professionals, mainly in professional fields, and help develop customized e-learning paths. In contrast,

CALMS is primarily aimed at e-learning professionals who use it to develop, organize, and manage e-learning materials.

- 3 E-learning content creation and reuse: CALMS is ideal for creating, storing and organizing e-learning content, offering flexible course customization to meet the needs of professional learners. It allows changes without affecting other users' experience. LMSs, on the other hand, usually target a wider audience and offer a standard version that everyone can access.
- 4 Monitoring capabilities: Both solutions can manage and monitor e-learning content, but CALMS has limited capabilities compared to LMS. The latter can monitor "non-traditional" projects such as blended and social learning activities, providing meaningful metrics for planning and monitoring.
- 5 Collaboration: CAMS dominates collaboration, often integrating online tools. However, an LMS has the advantage of being able to interact directly with other systems such as CRM and HR platforms and data collected from other sources., allowing specific user groups to be tracked

## ONLINE COMMUNICATION TOOLS

Online communication tools are applications and platforms designed to facilitate communication and interaction between individuals over long distances. They offer a variety of communication methods such as instant messaging, videoconferencing, forums, chat, wikis and social networks. These tools enable users to communicate quickly and efficiently, regardless of their geographical location. Online communication tools refer to the various software, applications and platforms used to facilitate remote communication (Ouariach et al., 2023). Online communication tools play an essential role in the professional, educational and personal spheres, enabling individuals to stay connected, collaborate and exchange information conveniently and instantaneously.

The use of these tools can pose certain challenges, particularly in terms of time management, mastery of technology and learner engagement. It therefore becomes imperative to carefully select appropriate communication tools that match the unique requirements of the learning environment, while taking into account the preferences and abilities of the learners themselves (Obasa et al., 2013).

Document sharing tools, virtual workspaces and project management applications facilitate remote collaboration. To distinguish online communication tools, there are synchronous and asynchronous communication tools.

It's important to understand the difference between synchronous communication (live videoconferencing, etc.) and asynchronous communication (e-mail, forums, etc.). Synchronous communication favors real-time interaction, while asynchronous communication allows for temporal flexibility.

### Synchronous online communication tool

Real-time interaction between participants is made possible through the use of synchronous communication tools. These technologies are widely used in e-learning, enabling learners to engage, collaborate and communicate with teachers and peers in a real-world environment. Synchronous tools find applications in a



variety of contexts, including virtual classrooms, online discussions, live tutoring sessions, webinars and virtual meetings.

**Table 1** shows a selection of synchronous technologies that can be used (Zahra et al., 2023).

**Table 1.** Synchronous technologies

Synchronous communication tool	Definition	Advantages	Disadvantages
<b>Chat</b>	A live communication tool that allows users to exchange text messages instantly with each other.	Chat platforms enable people to work in teams, share ideas and collaborate on projects, even remotely.	Chat management can present challenges in terms of time management, organization and ensuring equitable learner participation.
<b>Videoconferencing</b>	A real-time communication tool that enables users to establish live visual and vocal connections, using video and audio.	<ul style="list-style-type: none"> <li>- Participants can share presentations, documents and multimedia files in real time.</li> <li>- This feature facilitates collaboration and discussion around shared content..</li> </ul>	<ul style="list-style-type: none"> <li>- Videoconferences can require high bandwidth and advanced technology, which can be a challenge for users with limited resources.</li> <li>- Scheduling and coordinating videoconferences can also be complex.</li> </ul>
<b>Interactive whiteboard</b>	An interactive tool that lets users create drawings and write on an online whiteboard in real time.	<ul style="list-style-type: none"> <li>- Interactive whiteboards enable users to draw, write and share ideas visually in real time.</li> <li>- This feature facilitates communication and creativity by enabling immediate visualization of shared ideas.</li> </ul>	<ul style="list-style-type: none"> <li>- Using interactive whiteboards can be a challenge for users unfamiliar with online technologies.</li> <li>- In addition, interactive whiteboards can require high bandwidth and advanced technology, which can pose problems for users with limited resources.</li> </ul>
<b>Real-time polling</b>	An interactive tool that allows users to ask questions and get real-time feedback from learners.	<ul style="list-style-type: none"> <li>- It enables data and opinions to be gathered quickly during a communication session.</li> <li>- This provides instant feedback and enables organizers to make informed decisions in real time.</li> </ul>	Real-time surveys can be restricted by the number of participants or by learner preferences. Scheduling and coordinating real-time surveys can also be a challenge.

Asynchronous online communication tool

Asynchronous communication tools are applications or platforms that enable users to communicate at different times, without requiring a simultaneous connection. These tools offer the possibility of leaving messages, replying to previously sent messages and exchanging information without requiring real-time interaction.

Table 2 shows a selection of asynchronous technologies that can be used (Zahra et al., 2023).

Table 2. The asynchronous technologies

Asynchronous communication tool	Definition	Advantages	Disadvantages
Forum	Collaborating and sharing ideas over time (Zahra et al.,2024). An online discussion forum is a platform, whether a website or an application, that facilitates conversations between users on a variety of topics. Forums are generally organized into categories, allowing users to read and reply to messages at their convenience. They are commonly used in online communities, newsgroups, support websites and any other context requiring ongoing exchange.	- Forums offer a structured and organized discussion space, enabling users to share information, ask questions and obtain answers from the community. - Forum discussions can be archived and consulted at a later date, promoting the accumulation of knowledge and facilitating information retrieval. Facilitating debates and idea exchange (Ouariach et .,2024)	- Forums can sometimes suffer from limited or uneven participation, with some topics or discussions receiving less attention than others. - Dealing with trolls, spam or abusive behavior can be a challenge for moderators. - Forum discussions can also be less interactive and real-time than other communication tools.
Email	Electronic mail, commonly known as email, refers to a digital message sent and received via messaging applications. It serves as a means of communication, for both personal and professional purposes. What sets email apart is its asynchronous nature, enabling it to be sent and replied to at will, regardless of the time of day. In addition, email offers the possibility of organizing and archiving	- Email enables asynchronous communication, meaning that messages can be sent and read at any time, without the need for real-time interaction. - This gives users the flexibility to manage their time and respond to messages at their convenience. - What's more, email allows attachments to be sent, making it easier to share files and documents.	- L'email peut parfois entraîner une surcharge de la boîte de réception, avec de nombreux messages non pertinents ou indésirables. - La communication asynchrone peut également entraîner des délais de réponse plus longs et des difficultés à coordonner les échanges en temps réel. - De plus, il peut être difficile de suivre et

	data, making it easier to access and refer to information at a later date.	d'organiser efficacement les conversations lorsqu'il y a de nombreux échanges sur différents fils de discussion.
<b>Blogs</b>	<p>A blog is an online platform, whether a website or an application, enabling users to publish articles, images and videos. Blogs are used for both personal and professional purposes, whether to promote products or services, disseminate educational or informative content, and much more. Readers can comment on blog posts and take part in discussions.</p>	<ul style="list-style-type: none"> <li>- Blogs offer a platform for publishing content in a regular, organized way.</li> <li>- They enable users to share their knowledge, experiences and ideas with a wide audience.</li> <li>- Blogs can be used for personal or professional purposes, offering visibility and the opportunity to engage with readers through comments and discussion.</li> </ul> <p>-Blogs may suffer from a lack of interaction and engagement from readers, with a limited number of comments or discussions.</p> <ul style="list-style-type: none"> <li>- Blogs may also require ongoing effort to maintain regular content publication and attract a consistent audience.</li> <li>- Managing spam and inappropriate comments can also be a concern for blog owners.</li> </ul>
<b>Wiki</b>	<p>A wiki refers to an online platform, whether a website or an application, that offers users the ability to create and edit content. Wikis are used for collaborative projects, education and documentation. They enable users to create and modify pages, track changes and take part in discussions. Wikis facilitate the dissemination of discussions and modifications over time.</p>	<ul style="list-style-type: none"> <li>- Wikis are collaborative tools that enable users to create and edit content together.</li> <li>- This encourages the creation of collective knowledge, documentation and the collaborative updating of information.</li> <li>- Wikis are particularly useful for collaborative projects, education and teamwork, where several people can contribute and update content seamlessly it helps learners to upload files, such as documents, images, and videos, to support their work (Ouariach et al., 2023).</li> </ul> <ul style="list-style-type: none"> <li>- Wikis can face problems of vandalism, where malicious users intentionally modify or delete content.</li> <li>- The quality and accuracy of information can also be a challenge, as wikis allow anyone to modify content without thorough verification.</li> <li>- Coordinating and managing contributions can also be complex, especially in large wikis with many users.</li> </ul>

## **Practical examples of online communication tools, techniques, and their application in different e-learning contexts (Ouariach., 2024)**

- **Discussion Forums :**

**Tool:** Online forum platforms.

**Technique:** Establishing thematic discussion threads, overseeing moderation.

**Application:** Participants can engage in academic discussions, pose questions, exchange resources, and deliberate on essential concepts.

- **Video conferencing :**

**Tools:** platform LMS (Learning Management System), Zoom, Microsoft Teams, Google Meet.

**Technique:** Conduct live sessions, utilize split-screen functionalities.

**Application:** Educators can deliver real-time lessons, host seminars, workshops, presentations, and engage in question-and-answer sessions.

- **Electronic Messaging :**

**Tool:** E-mails.

**Technique:** One-to-one communication, prompt responses.

**Application:** Students can reach out to teachers for inquiries, seek assistance, or submit assignments.

- **Tool: Chat**

**Technique:** Real-time discussions, question-and-answer sessions, instant interaction.

**Application:**

- Synchronized Teaching: Conduct live chat sessions for interactive discussions on specific topics, promoting learner engagement and providing real-time answers to questions.
- Group Collaboration: Utilize chat for collaborative group work, enabling learners to collaborate on problem-solving or project completion.
- Remote Support: Teachers can provide swift, personalized assistance to learners by addressing their questions through chat, especially beneficial in the context of distance learning.

- **Tool: Wiki**

**Technique:** Collaborative content creation, shared editing

**Application:**

- Knowledge Building: Wikis serve as a platform for learners to collaborate on the development of learning resources, including writing articles, creating glossaries, or establishing knowledge bases.
- Collective Editing: Wikis facilitate multiple contributors working on a document, useful for group projects, enhancing articles or reports, and co-authoring documents.
- Revision Tracking: Wikis maintain a revision history, simplifying the tracking of individual contributions and the evolution of content.

- **Blogs and Online Journals :**

**Tools:** WordPress, Blogger.

**Technique:** Creating blog posts, commenting.

**Application:** Inspire learners to reflect on their learning experiences, share their ideas, and provide comments on posts from their peers.

- **Webinars :**

**Tool:** Online webinar platforms.

**Technique:** Live presentations, interactive sessions.

**Application:** Organize online training, presentations and conferences.

Online communication techniques and examples are highly adaptable and can be adjusted to meet the specific needs of our online courses and target audiences. It is crucial to choose the communication tools that best match our pedagogical objectives and to integrate them strategically into our online teaching. This customization helps to create a more effective and engaging e-learning experience, thus promoting the success of our learners. By cleverly adapting these tools to our teaching environments, we can enhance communication, interaction and collaboration while meeting the individual needs of each learner.

## **Discussions and limitations**

LMS, CMS, and LCMS systems all serve the purpose of managing educational content and facilitating e-learning. However, they do possess some distinct differences (Chen, 2012). LMS systems primarily focus on administering learning activities and tracking learner progress (Nguyen et al., 2005). They provide features for content delivery, assessment, and monitoring of the learning process (Sun et al., 2008). On the other hand, CMS systems are more geared towards organizing multimedia content and creating repositories for reusable learning objects (Vlachopoulos & Cowan, 2011). LCMS, on the other hand, combine the functionalities of both LMS and CMS systems, while also offering additional learning design tools and customized learning paths (Chen, 2012).

A comparative study revealed that LMS places greater emphasis on learning management, while LCMS focuses on reusable content objects and sequencing (Sun et al., 2008). On the other hand, CMS prioritizes centralizing content but lacks specific pedagogical functionality found in LMS/LCMS (Vlachopoulos & Cowan, 2011). In summary, each system possesses its own strengths - LMS for administration, CMS for content organization, and LCMS for integrated learning design (Chen, 2012; Nguyen et al., 2005).

The integration of communication tools offers numerous benefits. By incorporating forums and chat platforms, collaboration and interaction are greatly enhanced compared to standalone platforms (Joo et al., 2020). A blended approach that combines formal and informal tools supports diverse learning styles and enhances engagement (Dias & Dinis, 2014). Additionally, synchronous tools such as video conferencing foster a sense of community among remote learners (Jung & Huh, 2019). Furthermore, asynchronous discussions cultivate critical thinking and facilitate knowledge-building (Oakes, 2002).

Numerous universities have implemented blended models by incorporating their Learning Management Systems (LMS) along with tools such as blogs, wikis, and social media (Al-Fraihat et al., 2020). This flexible approach has proven to be highly adaptable for remote learning, especially during the pandemic (Selwyn et al., 2011). In

another study, the combination of a Learning Content Management System (LCMS) with chat, video, and messaging tools was found to effectively engage and involve students (Blau & Hameiri, 2010). Overall, the integration of established platforms with innovative communication tools supports dynamic pedagogy (Wood et al., 2011; Nasser et al., 2011; Strayhorn, 2010).

The effectiveness of technology-enabled learning hinges upon its proper implementation and adoption by educators and students (McGee et al., 2017; Morris et al., 2019). Without sufficient training and support systems, initiatives run the risk of yielding limited pedagogical gains or outright failure to achieve desired learning outcomes. As discovered by Morris et al. (2019), the mere provision of tools is insufficient; strategic change management is necessary to fully reap the benefits. The over-reliance on online learning poses a risk of amplifying pre-existing educational inequities (Dias & Dinis, 2014; Lee & Choi, 2011). Disparities in devices, internet access, and technological proficiency among different student demographics have the potential to marginalize individuals who lack the necessary resources or skills to fully engage in digital environments.

The utilization of external communication applications for educational purposes raises concerns regarding privacy and security. Institutions must address these challenges by implementing informed policy frameworks to safeguard data protection and prevent the sharing of inappropriate content (Tarhini et al., 2016).

### **Future applications and recommendations**

The study presented here illuminates the synergistic potential of integrating e-learning platforms with digital communication tools. Its findings not only shed light on current practices but also pave the way for future practical applications and avenues of contemplation. Foremost, the exemplary practices elucidated in this study can serve as a guiding compass for educational institutions seeking to implement a comprehensive approach. However, it is crucial to provide extensive support to teachers and equip them with the necessary technical training to effectively utilize these tools.

Furthermore, it is imperative to delve deeper into the collaborative and communal possibilities offered by hybrid environments. Exploring activities that foster peer-to-peer knowledge co-construction can unlock untapped potential. Conducting further research to assess the impact on academic outcomes and learner retention will allow us to solidify our recommendations. It is also essential to continue contemplating issues of equity and digital inclusion, ensuring that these systems are accessible to individuals from all backgrounds. These future research projects and practical applications align harmoniously with the conclusions drawn from this groundbreaking study.

### **CONCLUSION**

The advancement of online communication tools has revolutionized education and collaboration, providing a wide range of tools such as forums, videoconferencing, email, chat, wikis, educational social networks, blogs, and online journals. These tools offer new opportunities for interactive learning and remote

collaboration by facilitating instant communication, content creation, resource sharing, and knowledge development. By intelligently integrating these tools into educational platforms, learners and teachers can benefit from flexible and dynamic ways to enhance their educational experience, foster learner engagement, and encourage creativity in online learning. These online communication tools can be seamlessly incorporated into LMSs, CMSs, and LCMSs, thereby enhancing interactive learning. LMSs enable efficient course management through features like forums and messaging, while CMSs support website creation and can include communication tools. LCMSs are specifically designed for learning content management and collaboration.

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