Communication Tools and E-Learning: A Revolution in the Research Methodology of Communication for a Pedagogical Scenario

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ARTICLE INFO	ABSTRACT
Published Online: 03 April 2023	Communication is a source of motivation and cohesion, so knowing how to communicate is a way to facilitate e-learning interactions and group/class dynamics through various communication tools. Communication tools and e-learning have brought major changes to teaching and learning. These tools include online learning platforms, forums, webinars, online videos, podcasts, social media, and other advanced communication technologies. They allow learners and teachers to communicate and collaborate remotely, offering increased flexibility and accessibility. It is important to design instructional programs that effectively integrate these online learning and communication tools into the instructional scenario. E-learning allows teachers to choose from a variety of synchronous and asynchronous methods. Asynchronous methods allow for additional communication, while real-time or synchronous methods allow for in-process communication. The choice of communication tools associated with the training modules depends on the learning activity the trainer wants to perform.
Corresponding Author: Ouariach Fatima Zahra	In this case, we recommend that you offer a variety of communication tools and design your e-learning course to meet the needs of your learners.
KEYWORDS: Communication tools, e-learning, blended learning, pedagogical scenario.	

I. INTRODUCTION

Distance learning has developed in two main directions: "the flexible one-to-one teaching model and the extended classroom model" [1]. The first allows learners to start the course at any time, study in isolation, communicate with instructors and other learners to start the course at any time and communicate with instructors and classmates through asynchronous tools. The second organizes learners into groups, requires them to meet at a local study center, and allows them to use interactive technologies such as video conferencing, to use interactive technologies such as video conferencing to interact [1]. The advent of communication technologies and e-learning has changed the way we communicate, work and learn. Indeed, these tools have had a major impact on the way we work in communication by enabling new forms of collaboration, information sharing and teaching. Today, communication professionals have access to a wide range of digital tools that allow them to communicate with colleagues in real time, share documents and information seamlessly, and work collaboratively on complex projects remotely. Similarly, learners and teachers have the ability to use online learning platforms to take courses, access educational resources, interact with peers, teachers and participate in online research projects. We will discuss the different ways in which they can be integrated into communication work and teaching practices.

Communication tools enable real-time interaction between teachers and learners and provide faster and more effective ways to teach and learn. Communication tools include instant messaging, forums, chat rooms, email, blogs, wikis and webinars, and course management systems. These tools offer multiple possibilities for facilitating interaction and collaboration between teachers, learners, and other stakeholders. They include web-based systems, chat rooms, blogs, wikis and webinars. Using these tools can help enhance the educational experience by providing learners with a real-time, interactive platform to engage in meaningful dialogue with their peers and teachers.

Online communication tools and e-learning are increasingly common in education, both in traditional educational

institutions and in online learning environments. Information and communication technologies (ICTs) are used to deliver courses, learning activities, course materials, assessments, and distance communications. Online communication tools such as discussion forums, chat, email and social networks facilitate collaboration and communication between learners and teachers. On the other hand, e-learning offers learners the opportunity to take courses at their own pace and in their own workplace. However, online learning also presents significant challenges, including learner motivation and engagement, social interaction and communication between learners and teachers, and the effectiveness of online pedagogical methods. For these reasons, blended learning, which combines online learning with traditional teaching methods, is increasingly being used in education.

A new theory of learning in the digital age called connectivism, Connectionism emphasizes the importance of information and communication technologies for learning, particularly digital networks, social media, and online learning management systems. The article also emphasizes the importance of collaboration, diversity, and critical thinking to support learning in a changing world [2]. It offers a new perspective on learning in the digital age, emphasizing the importance of connection, active participation, and collaboration for the development of learners' knowledge and skills [2].

Several studies have been conducted to examine the use of online communication tools and online learning, as well as to evaluate the effectiveness of teaching scenarios for online and blended learning. Research has shown that online communication tools help encourage social interaction and communication between learners and teachers, and that online learning can be as effective as traditional instruction, especially when the instructional context is designed to meet the needs of learners.

II. COMMUNICATION TOOLS

Overall, this section details some of the synchronous and asynchronous communication tools that can be used to create a comprehensive and rich learning experience. Synchronous tools often enable real-time communication and collaboration in a "simultaneous-distant" model. These tools can involve people in different locations at the same time. The main drawback of synchronous tools is that, by definition, they must participate at the same time[3]. Time zone differences and scheduling conflicts can create communication and presentation problems. In addition, they are expensive and may require a lot of bandwidth to be effective.

Online communication tools are technologies that allow learners and teachers to communicate and collaborate remotely. These tools can include discussions, forums, video conferencing, interactive whiteboards, file sharing tools, live polling, etc. These tools are becoming increasingly important in the context of e-learning, where interaction and communication are essential to facilitate learner learning. Online communication tools can provide many benefits to learners and teachers, including real-time communication, remote collaboration, the ability to share resources and ideas, ask questions, and receive feedback online. However, using these tools can also present challenges in terms of time management, technology, and learner engagement. In addition, it is important to choose the appropriate communication tools to meet the specific needs of the learning context and to take into account the preferences and abilities of the learners [3].

A. Synchronous tools

Synchronous communication tools are technologies that enable real-time interaction between participants. They are widely used in online learning, allowing learners to collaborate, interact and communicate with teachers and other learners in real time. Synchronous communication tools can be used in a variety of settings such as virtual classrooms, online discussions, live tutoring sessions, webinars, virtual meetings, etc. Table C below describes some of the tools available in synchronous technologies.

Table 1: The different synchronous communication tools

Synchronous communication tools	Definition	Usability	Drawbacks
Chat	A real-time communication tool that allows users to communicate instantly with each other through text messages.	Chats can be used for group discussions, live tutoring sessions, and interactions between learners and teachers. Chats can also be used for review and support activities between learners.	Chats can be difficult to manage in terms of time, organization and equitable participation of learners.

video conferencing	A real-time communication tool that allows users to see each other and communicate live through video and sound.	Video conferencing can be used for presentations, group discussions, live tutoring sessions and learner-teacher interactions.	Video conferences can require high bandwidth and sophisticated technology, which can be challenging for users with limited resources. Video conferences can also be difficult to schedule and coordinate.
Interactive whiteboard	A tool that allows users to draw and write on an online whiteboard in real time.	Interactive whiteboards can be used for presentations, group discussions, live tutoring sessions and collaborative activities between learners and teachers.	Interactive whiteboards can be difficult to use for users with little experience with online technologies. Interactive whiteboards can also require high bandwidth and sophisticated technology, which can pose challenges for users with limited resources.
Real-time survey	A tool that allows users to ask questions and collect feedback in real time from learners.	Real-time surveys can be used to assess learner understanding, gather feedback on presentations or activities, and encourage active learner participation.	Real-time surveys can be limited by the number of participants or learner preferences. Real-time surveys can also be difficult to schedule and coordinate.

To sum up, synchronous online communication tools can be useful in fostering learners' active participation, collaboration, and critical thinking. However, these tools can also pose challenges in terms of time, organization, and technology, and their use must be tailored to the specific needs of the learning context.9

B. Asynchronous tools
Asynchronous communication tools are applications or platforms that allow users to communicate at different times without having to be connected at the same time. These tools allow users to leave messages, reply to previously sent messages, and exchange information without requiring real-time interaction. Table D below describes some of the tools available in asynchronous technologies.

Table 2: The different asynchronous communication tool

Asynchronous communication tools	Definition	Usability	Drawbacks
Forum	Online discussion forums are websites or applications that allow users to create and participate in online discussions on a wide range of topics. Forum posts are organized by topic and can be viewed and replied to at any time. Discussion forums are used in online communities, newsgroups, help sites and other situations that require ongoing conversation.	Exchange of information and views and knowledge sharing.	Difficulty in finding relevant information and risk of trolling or hate speech.

Email	E-mails are electronic messages that can be sent and received via email applications. Email can be used for personal or business correspondence. E-mails are asynchronous in that they can be sent and replied to at any time. Emails can also be organized and archived for future use.	Exchange of electronic messages.	Difficulty to follow conversations and risk of data loss.
Blogs	A blog is a website or application where users can post articles, images and videos. Blogs can be used for personal or professional communication, such as promoting products or services, publishing educational or informational content, etc. Readers can comment on blogs and post discussions	Publishing content, sharing opinions.	Privacy risk and risk of negative feedback.
Wiki	A wiki is a website or application that allows users to create and edit content. Wikis can be used for collaborative projects, education and documentation. Wikis allow users to create and edit pages, track changes, and discuss changes. Wikis can be used to defer discussions and changes.	Collaboration and knowledge sharing.	Risk of editing conflicts and need to protect sensitive information.
Collaborative dashboard	Collaborative dashboards are online tools that allow users to work together on projects. Dashboards can contain task lists, schedules, calendars, graphs and other useful information. Collaborative dashboards allow users to share files and comments and work together on tasks.	Share data, indicators, reports, graphs and dashboards with other users in real time.	Technical complexity, high cost and lack of user engagement.

To sum up, asynchronous communication tools are communication methods that allow users to communicate at different times without having to be connected at the same time, thus offering great flexibility and better organization of information.

III. E-LEARNING

E-learning allows individuals to acquire new knowledge and skills at their own pace within the constraints of their time, taking into account their family, work and personal commitments [4]. Academia has followed suit to meet the growing demand. Brain-based learning tells us that learners construct their own knowledge from information already in their brains [5].This knowledge coupling allows the brain to synthesize new information, create new threads of knowledge, and form critical thinking, learning, and knowledge networks. A study of emotions and affective processes in learning is not new, but is gaining importance in online learning. Learners' motivation, engagement and satisfaction have a major impact on the success of their online courses [6]. Moreover, online learning can take many forms, including blended pedagogy that combines online and face-to-face learning. He defines the concepts of motivation, learning, and educational, information, and communication technologies (ICT) in the context of online learning [7].

Online learning also supports its role as a model for inclusive education, facilitating access to higher education and developing digital skills. Research shows that the active use of electronic and digital media and devices in online education can improve access, development and quality of education [8][9]. In addition to formal education supports that online education uses the same virtual environment to deliver and standardize students' technical and digital skills [10][11] This reduces potential digital divides across multiple

intersecting dimensions, including social class, physical disability, geographic location, and age [10].

Online learning has become a breakthrough in education and has been widely used during the epidemic in recent years. The pandemic of covid 19 in recent years. It is a term for perspective and understanding. E-learning is the use of networks and Internet technologies in learning [12].Another definition of e-learning is a training learning program or education through electronic means[13].In addition, e-learning is defined as a technological means to support learning [13].Technological means to support learning [14].

IV. BLENDED LEARNING

Blended learning is an innovative type of training that combines traditional face-to-face training sessions with the use of digital distance learning tools in a virtual classroom. This combination allows learners to follow the training sessions at their own pace while benefiting from the expertise and interaction with the trainer. The flexibility of this hybrid format allows training to be delivered to audiences with different time and travel constraints. As such, it is a hybrid format that preserves the advantage of face-to-face training by ensuring explanations of key concepts and methods, resolution of misunderstandings or misconceptions, and on-site communication and intervention [15].

One of the most popular definitions of blended learning is getting the "right" skills to the "right" learners. Teach the "right" skills to the "right" people at the "right" time by combining the "right" learning techniques with the "right" way to learn. Learn the "right" way to learn to achieve your learning goals [16]. According to another definition, blended learning is combining the powerful and beneficial features of online learning with face-to-face learning [17]. Blended learning is a new approach to systematically and strategically integrating ICT learning tools into university courses, combining online training with the potential of classroom technology to increase learning effectiveness [18].

V. RESEARCH METHODOLOGY

The subject of our research concerns the management of communication tools in an online training through an LMS platform.

Concerning our research methodology, this topic is part of an action research approach, which is characterized by a joint contribution combining theory and practice. Action research usually starts with problems identified in the field and predicts action through theoretical research by creating networks of pedagogical, and technological conditions to create potential learning spaces and find new solutions [19].

This study describes the different aspects of managing communication tools in online learning via LMS platforms. The communication tools available on these platforms are essential to facilitate communication between teachers and learners and to encourage collaboration and interaction between learners. These studies also highlight the importance of communication management in learning management systems and its positive impact on online learning.

The research methodology consists of two distinct parts:

The first part will be devoted to a bibliographic study or state of the art literature search. This study will consist of an examination of the basic concepts of communication starting with a definition of the concept of communication through key authors in communication such as Shannon and Weaver, who proposed the best-known model of communication. We will also explore other communication theories such as the theory of communication action, public relations theory, and persuasion theory to better understand the different types of communication. to define e-learning and LMS platforms, identify the different types of communication tools used in an online course, and compare LMS platforms with other CMS and LCMS platforms. Using the information gathered during this bibliographic study, a theoretical framework will be proposed for an e-learning situation. This theoretical framework will justify the choice of different communication tools and explain when and how to use them to create an effective e-learning situation.

Next, we will examine the different communication tools used in online training through an LMS platform. This will include an analysis of communication features such as discussion forums, live chats, emails and webinars. We will also examine the benefits and limitations of each tool to better understand their impact on online learning.

The second part of the research methodology is devoted to the contribution. First, an architecture of an e-learning situation integrating communication tools will be proposed. This architecture will be based on the results of the bibliographical study, as well as on the specific needs of the envisaged learning situation. In a second step, a prototype of an e-learning situation will be developed, integrating the communication tools identified in the bibliographic study and justified in the first part of the contribution. The objective of this part is to show concretely how communication tools can be used in an effective way in an e-learning situation through an LMS platform and will take into account the best practices in pedagogical design for environments.

We will justify the choice of the selected tools; explain how they will be integrated in the learning situation and how they will contribute to the achievement of the pedagogical objectives? We will also evaluate the effectiveness of the prototype by using evaluation methods such as surveys and knowledge tests. In the following, we propose an architecture of a pedagogical scenario of a learning situation.

VI. PEDAGOGICAL SCENARIO OF A LEARNING SITUATION

A teaching scenario is a document that describes the different stages of a teaching/learning process. Here are the different general steps that can be found in a teaching scenario:

A. General information

The general information of an educational scenario includes several important elements, such as the title of the SPOC or MOOC, which should reflect the content of the training. The target audience is also crucial, as it helps determine the level of complexity and content of the course. The discipline taught as well as the category (e-learning, SPOC, MOOC, etc.) and the domain (IT, communication, finance, etc.) are also elements to be specified to give an overall idea of the content of the scenario. The language in which the training will be delivered is also an important point to specify. The duration of the situation as well as the number of sessions are elements that allow the planning and organization of the training. Finally, the designer of the SPOC or MOOC can give an idea of the institution or organization that is behind the training.

B. Pedagogical objectives

Objectives have become an indispensable tool for the designer. One of the first steps in instructional development is to ask what the goal of learning is, what skills, abilities or behaviors we want to develop in learners, and even what cognitive activities we want to stimulate. The objectives may include the acquisition of conceptual knowledge, the mastery of technical skills, the development of communication and collaboration skills [20]. The skills developed will depend on the objectives of the training and the teaching strategy chosen to achieve these objectives. In terms of competencies, a well-designed instructional scenario should enable learners to acquire discipline- or domain-specific competencies, as well as disciplinary and cross-cutting competencies such as problem solving, decision making, and critical thinking.

Bloom's taxonomy is a well-known pedagogical theory that divides learning objectives into six levels: knowledge, understanding, application, analysis, synthesis and evaluation. This taxonomy is often used to develop clear and measurable learning objectives for instructional scenarios. For example, objectives aimed at developing an understanding of theoretical concepts might be categorized at the "understanding" level of the taxonomy, while objectives involving applied practical skills might be categorized at the "application" level. Therefore, it is important for lesson plan designers to understand how the different objectives they wish to achieve fit into Bloom's taxonomy. This will allow them to design appropriate activities and assessments to measure learner success.

C. The four stages of the learning process

The learning process generally consists of four stages: situation, conceptualization, objectification and transfer [21].

1) Situation: In the situation phase, learners prepare to learn by seeking information and familiarizing themselves with the learning objectives. They can also familiarize themselves with the activities and resources they will use during their studies.

2) Conceptualization: In the conceptualization phase, information and knowledge are presented to the learners. This can be done through live lectures, recorded videos, conferences and demonstrations.

3) Objectivation: During the objectivation phase, learners apply what they have learned through interactive exercises, projects and practical activities. This helps to develop their understanding and reinforce their knowledge.

4) Transfer: In the transfer phase, learners are assessed on their understanding and application of what they have learned. This can be done through exams, assignments and projects. Transfer helps to measure progress and identify areas for further reinforcement.
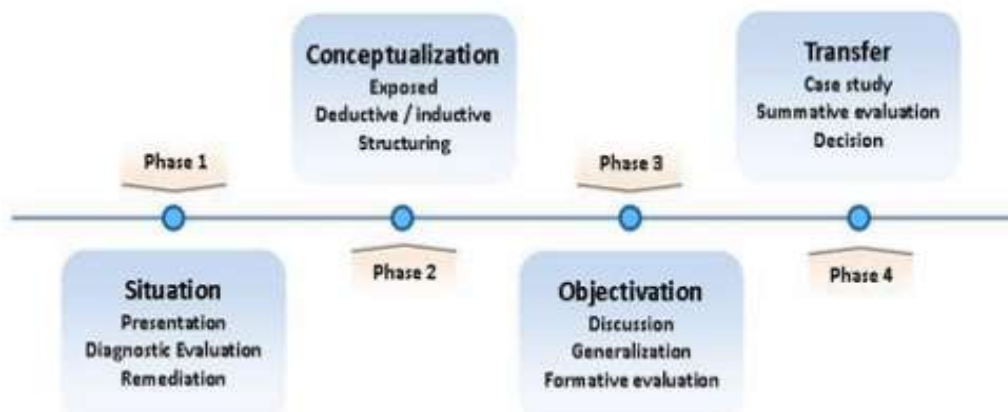

Figure 1 : Example of the life cycle of a pedagogical scenario in a learning situation [21].

VII. CONCLUSION

Adaptive learning tools are technologies that can be synchronized with a learner's learning process to increase their understanding and engagement in the learning process. Online learning is becoming increasingly common, allowing learners to access a variety of educational resources remotely and plan their studies in a flexible manner that can play an important role in modern education. They provide more flexible and interactive learning opportunities for learners and greater flexibility for teachers to tailor their teaching to the needs of learners. Communication tools allow learners to easily communicate with teachers and other learners, while the online learning environment provides flexibility for learners who wish to learn at their own pace. Blended learning combines elements of online and face-to-face learning to provide learners with a more immersive learning experience. Teaching scenarios are also a valuable tool for teachers as they allow them to create immersive and engaging learning situations for their learners. By effectively using these tools, we can create a more stimulating and dynamic learning environment for our learners, which helps increase their motivation and academic success.

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