

## **Learning and Knowledge Technologies (LKT) to improve teaching processes in virtual education**

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### **ABSTRACT**

Virtuality has become a teaching modality, CT, as a tool to improve teaching processes. This study provides an overview of CT and its objective is to know the use of CT to optimize virtual education in universities. As a result, after the bibliographic review, different tools have been found such as: Google docs, Prezi, Google classroom, YouTube among others, concluding that both teachers and students should put into practice their communication skills to transmit information with the use of these technologies for problem solving.

**Keywords:** Virtuality; CAT; Teaching processes; Virtual education.

### **Introduction**

In the last decade, the growth of virtuality has transformed the way in which individuals manage the information they need and their methods of communication, this has also impacted educational centers, promoting virtuality as a viable alternative to traditional classroom education. CT encompasses a diverse set of digital materials and resources designed to provide elements of teaching and learning in virtual environments. These technologies have the potential to significantly improve teaching and learning processes in virtual education.

In this context it can be said that, in the digital age, virtual education is a popular form of teaching and learning and with the expansion of ICT, educators have begun to employ CTs to enhance classes in e-learning classes. These technologies offer a set of strategies and approaches that make learning more dynamic, interactive and collaborative. In this article, we will explore some of the most effective CTs and how they can contribute to improve virtual education (Sancho, 2008).

For Lozano (2011) and Cabero, (2015), learning and knowledge technologies (LKT) are a way to use information and communication technologies (ICT) as a training tool to improve both teaching and learning, which is why both students and teachers explore didactic uses for the acquisition of knowledge by learning in a meaningful way with technology involving formal instances of education in the classroom, i.e., mind maps, concept maps, case analysis, among others that support the teaching work.

These tools make the contents of the classes more attractive and facilitate learning because it goes from unidirectional to bidirectional learning where everyone is a protagonist in the educational centers and outside them; in this case, virtuality is not only a technological instrument but a dynamic and meaningful one that adapts to each student and his or her learning needs.

According to the above, it can be said that the TAC is not learning on their own but acquiring the skills to make this learning happen through the management of image editing programs, file sharing, creation and management of folders in the cloud, skills for the use of the Internet, creation and management of virtual forums, design of evaluations and creative and attractive material according to the needs of students, among others.

## **Development**

Lozano (2011), adds that those who talk about ICTs claim that the ICT model is excessively computerized, instrumentalist and not very motivating for what current teachers and students need and can learn to use, but nothing could be further from the truth because globalization, the pandemic, the modernization of processes and other aspects have validated technologies as a useful tool in society, education, finance, and various areas in general.

Learning and Knowledge Technologies offer a set of tools and approaches that can significantly improve teaching processes in virtual education, such is the case of:

- Virtual platform-based learning, virtual learning platforms, such as learning management systems (LMS), are central to virtual education. These platforms provide an online space where educators can share educational materials and encourage active participation. In addition, LMSs often include real-time communication tools, such as forums and chat rooms, which facilitate the exchange of ideas between students and teachers.
- Interactive educational content allows the creation of interactive educational content, which may include videos, simulations, infographics and educational games. These types of resources promote student participation, stimulate their interest and facilitate the understanding of complex concepts. In addition, interactive content can be adapted to different forms of learning, which helps to meet the individual requirements of students.
- Collaborative online learning facilitates collaboration among students, even in virtual environments. Online work techniques, such as shared workspaces and webinars, allow students to work together on projects, conduct discussions and share ideas. Collaborative learning promotes skills such as collaborative work, good communication and situation solving, and CTs make it more accessible and effective in the virtual education context.
- Online assessment and feedback improve methods of assessing the reception of content and feedback in the virtual world. Educators can use online tools to design and manage online tests. These tools can provide quick feedback to learners, allowing them to identify areas of improvement and strengths. In addition, teachers can use progress tracking tools to monitor student performance over time and adapt their teaching accordingly.

Thus, Enriquez (2012), shows that users must have skills to develop content with their own resources and autonomously, must handle programs and tools logically and with little effort so that educational practices occur naturally and make it easy for them to edit texts and images, training and virtual classes by zoom or meet, the use of google docs or others that allow the storage of relevant information for classes.

Among the advantages of ICTs in virtual education is that they provide high quality didactic tools, allowing students to access a wide range of content and study materials. This broadens their learning opportunities and allows them to explore concepts in a

deeper and more autonomous way. In addition, CTs facilitate interaction and collaboration between students and teachers through forums and collaborative platforms.

Despite the aforementioned advantages, it can be said that the implementation of CTs also presents challenges. One of the key challenges is the digital divide, which refers to disparities in the ability to use technologies among different groups of students. It is important to address this gap and ensure equal opportunities to benefit from TACs. Another challenge is the need for adequate teacher education and training. Teachers must be prepared to effectively use CTs in their pedagogical practices (Viñals-Blanco & Cuenca-Amigo, 2016).

Forero and Triana (2019), raise the case of the La Sabana University, which like many other universities has a Virtual platform based on Moodle, to teach classes. Thanks to the free Moodle software, many universities have been able to deliver virtual classes effectively and efficiently in addition to managing their educational resources to promote collaborative, self-directed and dynamic learning, improving communication channels (Lerís and Velamazán, 2015).

In addition to Moodle, there are applications such as SuperMemo, Kahoot!, Quizizz, among others, which have captured the attention of teachers and students for their diversity in delivering content, creating questions and answers, editing answers, among other advantages, and the above through the gamification technique, known among students as a tool that allows them to receive effective feedback and ordinal scores in each delivery, giving them the opportunity to review the content and make new deliveries to improve their learning processes.

These platforms, allow its use on cell phones and the delivery of individual and group answers, in addition to setting different times in the evaluations and delivering statistics of results to measure the performance of both each student and a particular course (Furusetth and Versvik, 2018). However, not all platforms are the same so Shamil (2018), makes it clear that a distinctive feature of Quizizz is that it has no character limit and dates can be set for the completion of assessments, SuperMemo, is characterized by helping users with tasks and content with and without internet connection which makes it much more viable for use in areas with poor connectivity.

Continuing with the topic of providing an overview of the use of ICTs in education, it can be said that another important advantage is their ability to promote collaborative work between students and teachers, despite being in virtual environments, and this

occurs through online learning platforms and other applications, so it can be said that ICTs facilitate communication and the exchange of ideas. This not only promotes collaborative learning, but also improves student participation and engagement, creating a more active and enriching learning environment.

In addition, CTs offer a wide range of assessment and feedback tools that allow teachers to monitor student progress and adapt their pedagogical approach accordingly. These tools range from online quizzes and automated tests to activity logs and data analysis. By providing immediate and detailed feedback, CTs can help identify students' strengths and weaknesses and offer more effective and personalized guidance.

It is important to consider that, in virtual teaching processes, it is the teacher's responsibility to provide material and content that is easy to use and understand, i.e., documents with an appropriate language for users and that the practical work material can be handled by students in a natural way. This will motivate them to use these tools and feel identified with the contents of the subjects, which is why Bauer (2019), states that the teacher who uses ICT should have in his teaching material, presentations, videos, podcasts, simulation programs, among others, to offer a variety of elements to his students.

Similarly, CAT are useful not only for classes but also for the effective feedback of evaluations and the delivery of reinforcement content for subjects in which students have greater difficulty.

Another objective of the research has to do with the way in which CAT can be used effectively to contribute positive elements to virtual teaching, so it is necessary to know a little about some of them in order to provide management proposals in educational centers. The following is a brief description of tools for the elaboration of teaching material in the virtual world:

- Videos and questionnaires allow the explanation of contents so that the user can review them at the moment and during the time he/she deems convenient; intermediate questions can be added as a formative evaluation tool, so that the student can verify the mastery of the subject matter of the class. For the above, it is recommended that the language be clear, changes of tone in the voice, the delivery of examples adjusted to the reality of each group of students, the use of images and key words, a duration of 4 to 5 minutes, among others. In the case of questionnaires, the questions should be of medium taxonomic level and no more than 5 questions to avoid visual fatigue and boredom of the students.

- SuperMemo, is a software that allows the configuration of words through an algorithm that makes them repeat to learn them easily, helping the memory to remember them later, being useful for learning other languages or the technical language of a career, the idea is that the teacher places a bank of words so that students can consult and answer if they know it or need help with its meaning. In this program the responsibility falls on the student because he/she must be constant in its use in order not to forget the words learned.

CT gives a new look to the use of technology in the classroom, as long as the didactic and pedagogical means of the institutions are adapted for its implementation, that is, it is not possible to take the current curricular program and migrate it to virtuality, it must be adjusted to the new reality, where the optimal use of these tools depends on the skills of teachers and students for the management of technology and of those in charge of curriculum design to transform pedagogical models into new teaching methodologies.

Therefore, the professional training of teachers will be determined by competencies, skills and knowledge in educational technology to be able to adapt traditional methodologies to e-learning through the implementation of training and workshops focused on these topics.

According to what has been exposed, teachers go from executors to facilitators of the teaching processes so that students play a leading role in their training and this is achieved by being committed to education and adjusting the contents to the current educational needs considering the limitations of some educational centers and students. Similarly, pedagogy should be focused on collaborative and cooperative work to generate reflective learning that allows students to create their own knowledge while maintaining interest in consolidating and absorbing the information delivered.

The new generations of teachers have the responsibility to review curricular programs and propose changes to improve teacher training processes, information supported by Matos & Sanchez (2016), who ensure that student understanding will improve as long as the contents and the language used to deliver them effectively reach students with strategies designed according to their learning needs to acquire knowledge at their own pace and style without the presence of barriers of content, space and time.

In other words, they show that it is not necessary for everyone involved in the educational process to have a complete technological mastery, but it is necessary to have the bases that allow them to deliver contents and evaluations with virtual resources

such as concept maps, interactive expositions and methods that allow the active participation of the students.

Chamilo E-Learnig & Collaboration Software, (2015), states that there are many didactic, assessment and learning monitoring platforms such as MOODLE and Chamilo, Google docs, Prezi and Slideshare, in addition to video editors such as Quik, Splice and Stupeflix, Vizia and Edpuzzle and information users such as Google and YouTube and Kiddle. In addition, concept mapping tools such as Mindomo and Bubble.us, among others.

It is important to note that, while CTs offer a number of benefits, their successful implementation comes as a result of correct and systematic programming and appropriate training for both teachers and students. Teachers must be able to link CTs effectively into their pedagogical practices, taking full advantage of the tools available and adapting them to the needs of their students. On the other hand, students should receive guidance on the responsible use of ICTs, develop digital skills and learn how to make the most of these tools in their learning process.

The TAC resources implemented in educational centers include: Quik, Splice, Stupeflix, Vizia, among others to create and edit videos, SoundCloud for audio management, Powtoon, Sparkol, to design mind maps and others with more didactic uses such as iDoceo, Additio Cerebriti Edu, Quizizz, Trivinet, Jeopardy Rock and Kahoot! among others, for classroom management and content evaluation, without leaving aside communication tools such as Homeroom, Otter, Blogger, Padlet, Team Maker, Teamweek, Meetingwords, as well as tools to search for information such as YouTube Kids and Kiddle. The aforementioned resources and tools will allow students and teachers to put into practice their creativity and technological skills to take advantage of each of them in their classes.

According to the above, it can be assured that nowadays a renewed education where knowledge, cooperation, collaboration and flexibility in the processes are validated so that the contents of the subjects are assimilated by the students at their own pace and according to their needs without the delivery of excessive and complex information that makes meaningful learning difficult in the classroom.

## Conclusions

ICTs play a key role in improving teaching processes in virtual education. These technologies refer to a diverse set of virtual materials and resources specifically designed to support learning in virtual environments. Their importance lies in their ability to reduce certain temporal and geographical limitations associated with face-to-face education, and to provide students and teachers with accessibility to effective educational resources.

One of the most relevant elements of ICTs is their ability to enrich educational content. Through interactive, multimedia and online resources, ICTs can present information in a more attractive and dynamic way, which facilitates the delivery of content and its application in learners' everyday environments. In addition, CTs allow for the adaptation and personalization of content, which is especially beneficial in fostering more autonomous learning on the part of learners.

Through the implementation of ICTs, it is possible to improve teaching processes in virtual education in universities because they enable knowledge management in a conscious way, engaging students in their learning processes and promoting spaces for cooperation and collaboration. According to Valarezo et al, (2019), a good use of ICTs should contain elements with good design of updated contents and dynamic methodologies that favor the educational process and technological literacy, i.e., students and teachers should be able to put into practice their communication skills to transmit information and then it can be applied to solve problems in their own context.