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Development of ICT competencies for Higher Education teachers in COVID-19 time

Desarrollo de competencias TIC a profesores de Educación Superior en tiempo de COVID-19

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Abstract

In the 2020-2021 academic year, due to the COVID-19 pandemic, in many countries, face-to-face educational activity in any of its manifestations had to be suspended, forcing the teachers of these educational institutions to plan and develop a new virtual teaching-learning process. Given this scenario and the current uncertainty, technological resources become an ally for teachers, making it necessary to disseminate experiences such as the one collected in this study: the use of video tutorials in higher education. Based on a quasi-experimental research design, only post-test of a group of teachers who took the courses, after applying an electronic questionnaire to 29 teachers, the planning and implementation of videotutorials for the transmission of theoretical and practical contents in each of their subjects is analyzed. The evaluations carried out show a high level of acceptance of the resource, especially for analyzing and reflecting on the contents; solving practical problems and organizing the study. Likewise, the relationship between the perceived usefulness of the videotutorial and the intention of future use is reflected. The study concludes by highlighting the educational potential of the use of videotutorials in distance higher education.

Educational video, Digital transformation, COVID-19

Resumen

En el curso 2020-2201, debido a la pandemia COVID-19, en muchos países, la actividad educativa presencial en cualquiera de sus manifestaciones tuvo que ser suspendida, obligando a los docentes de estas instituciones educativas a planificar y desarrollar un nuevo proceso de enseñanza-aprendizaje virtual. Dado este escenario y la incertidumbre actual, los recursos tecnológicos se convierten en un aliado para los docentes, por lo que es necesario difundir experiencias como la recogida en este estudio: el uso de videotutoriales en educación. Basado en un diseño de investigación cuasi-experimental, solo post-test de un grupo de profesores que realizaron los cursos, luego de aplicar un cuestionario electrónico a 29 docentes, la planificación e implementación de videotutoriales para la transmisión de contenidos teóricos y prácticos de cada uno de los profesores fue analizada. Las evaluaciones realizadas muestran un alto nivel de aceptación del recurso, especialmente para analizar y reflexionar sobre los contenidos; resolver problemas prácticos y organizar el estudio. Asimismo, la relación entre la utilidad percibida del videotutorial y la intención de uso futuro se refleja. El estudio concluye destacando el potencial educativo del uso de videotutoriales en educación superior a distancia.

Video educativo, Transformación digital, COVID-19

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Introduction

The confinement that was decreed during the pandemic in the year 2020, forced to generate multiple changes in the way of imparting education to students. It was of major importance to establish innovative didactic strategies, which although they had existed for a long time, they had not been implemented regularly; always taking care of the emotional part of the students, which was affected, in many occasions, by the social distancing. The design of activities that involve both characteristics represents one of the main challenges during the pandemic. Teachers have had to make use of all their professional experience and adapt it to the needs, learning different technological tools, many of which were unknown, but which finally renewed the teacher's profile for distance education.

Today, with the uncertainty generated by the pandemic in all educational contexts, teachers are asking themselves what teaching will be like in the coming years. Studies such as the one conducted by Trujillo, Fernandez, Montes, Segura, Alaminos & Postigo (2020), support the idea that it is the right time to rethink the educational model completely. Therefore, the current challenge, in the way of quality higher education, lies not only in overcoming the adversities originated by the COVID19 pandemic; but, as Pérez-Gómez (2019) points out, before the pandemic, that it was necessary:

> "to design and organize space, time, social relations, activities, curriculum and evaluation to help form the educated, supportive and autonomous citizen that the complexity of this contemporary global and digital scenario demands" (p.4).

For several years, technology has been considered a factor that facilitates the delivery of education, however, due to current circumstances, a situation has arisen in which education is entirely dependent on technology (Mateo-Berganza & Lee, 2020). During the confinement that took place in Mexico between March and June 2020, the use of different technological resources (virtual campuses, discussion forums, videoconferences, etc.) has been of great help in the delivery of courses in the period 2020-2021.

However, the availability of resources has not been the only problem, due in part to the lack of experience and insecurity that non-presence has generated in teachers (Cabero & Valencia-Ortiz, 2021); on the other part, students were not prepared for the situation that occurred, so they have not been able to organize their time in the new modality and have felt overloaded with work.

Development

Multimedia materials, such as audio, videos, and interactive activities, emerge as a powerful tool to support education, allowing teachers to design activities in a different way. Multimedia requires planning for its incorporation in education, since its achievement depends not only on the material being attractive, but also on the objectives for which it was designed being fulfilled correctly. It is important to point out that learning strategies must be conceived for the informative part, plan the student's performance, monitor the execution, and finally evaluate the results obtained so that it works as expected.

Today, more than ever, teachers are facilitators of learning and must always prepare teaching opportunities for their students. In this sense, it is essential to stimulate the students' desire to learn in order to maintain a high level of motivation.

Some alternatives offered by the use of multimedia for the design of teaching activities are: animations, highlighted words in a text, display of images, words or symbols, hypertext, self-monitoring learning systems, and the most recent ones, video tutorials, among others.

In the words of González (2013), the activities to be developed for the creation of multimedia materials include the following aspects:

- Content organization.
- Analysis of the ways of presenting information.
- Special lessons considering the technological skills of the students.
- Graphics to represent situations.

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- The contents should serve as reference material.

Based on these premises, it can be stated that videotutorials are multimedia elements that allow providing the informative part of the teaching process in a dynamic way, which attracts the student to follow it as a guide in learning. Videotutorials as a teaching strategy rather than a learning strategy are well valued, because they allow to review the content as many times as necessary, until the student achieves the desired knowledge or the development of some proposed skill.

The use and application of different directions for learning allows this to be achieved in a better way, for example, it is better to listen and see, than just see or just listen, the more senses you use in the teaching process, the better the learning process will be. What is seen remains more in the memory than what is heard, but if you listen and see, the understanding of that knowledge is lasting. It is a dialectical and dynamic activity of the teaching process in the educational process (Solovieva, 2019).

The video tutorial as a learning strategy allows receiving the information in a visual and auditory form to subsequently put it into practice effectively and obtain the desired learning result. In computer science, video tutorials are currently becoming very popular, due to the ease with which they allow learning and also focus attention on the completion of only one task at a time, so the student puts all his attention and interest in the development of that skill or knowledge. As proposed by Palomino, Salinas and Sanchez (2019) in their research where they conclude that video tutorials improve procedural, conceptual and attitudinal learning of students.

Theoretical framework

As is known, the restrictions imposed by COVID-19 on face-to-face teaching in Higher Education Institutions (HEIs), although its use was already a consequence that many teachers have to implement different tools to make the switch to virtual teaching (Cahapay, 2020). Among the resources employed by teachers during this period is the use of video tutorials for asynchronous explanation of content to students (Reimers & Schleicher, 2020).

The use of these was already a practice present in higher education contexts as an element of support for both face-to-face (Lai & Williams 2017) and blended (Karma, Darma, & Santiana, 2019) and non-face-to-face teaching (Scagnoli, McKinney, & Moore-Reynem, 2017). Among its main advantages is its ability to present information using different modalities, auditory and visual, which reinforce and complement each other, as well as providing an example of the process that is easy to follow and that students can replicate autonomously (Van der Meij & van der Meij, 2014).

Additionally, the use of such resources also has a positive effect on students' motivation, which is especially important in subjects that may be unattractive (Martínez-Abad & Hernández-Ramos, 2017). These characteristics mean that video tutorials are frequently employed in flipped classroom designs to guide the student's self-learning process (Murillo-Zamorano, López Sánchez, & Gogoy-Caballero, 2019). Consequently, the number of researches about the educational use of video tutorials is increasing. These can be classified into two groups:

- Research focused on academic performance: confirming the positive impact on student performance (e.g., Kazanidis, Pellas, Fotaris, & Tsinakos, 2019).

- Adoption-focused research: mainly focused on the analysis of students' opinion and satisfaction with these tools (Maziriri, Gapa, & Chuchu, 2020).

The social context generated by the pandemic in Mexican HEIs allows us to analyze the effectiveness of this technology in an exceptional moment, in which motivation and self-managed learning have played a fundamental role in the development of the learning process. The present research intends to take advantage of this circumstance to contribute to the development of the literature on the subject, analyzing the opinion of students in the course-workshop on the use of video tutorials to explain contents of each one's subjects.

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The research suggests that the mechanisms through which the teaching identity is shaped include modeling, which refers to the process through which the students of the course-workshop acquire a series of conceptions about how teaching should be and the type of professionals they aspire to be through their experience as students and the observation of the teachers who have educated them (Holt-Reynolds, 1992).

Several studies have affirmed that the use of ICT in times of pandemic has been positive. In this sense, Parada & Rodríguez (2021), point out that many of the adaptations that were made during the pandemic will continue to be used as part of the traditional model, due to their effectiveness in the learning process of students. For their part, Espinoza & Gutierrez (2021), point out that during the time of the pandemic, ICT were relevant, due to the use they were given, either in the design of teaching materials, web pages, and multiple technological tools used in the teaching-learning process.

Methodology

In order to achieve the objective and the questions proposed in the research, a quantitative study (Johnson, Onwuegbuzie, & Turner, 2007) was proposed based on a quasi-experimental research design with a single-group posttest (Campbell & Stanley, 1963). In this way, the reality was analyzed after the application of an educational intervention, or treatment, which consisted of learning the design and use of videotutorials for the transmission of theoretical and practical contents of subjects at the Universidad Autónoma de Nayarit. Due to the low level of experimentality of this research, and that a pretest-posttest longitudinal evaluation is not applied, no working hypotheses are established as such, but are intended to address the research questions posed in the introduction.

The questionnaires were implemented in the Google Forms platform and provided to students through the different subjects of the course-workshop, who answered voluntarily between May 20 and 30, 2021. After collecting the information, it was extracted from Google Forms and filtered for use with the SPSS v.24 statistical package. After confirming the validity and reliability of the scale used, descriptive and correlational data analysis was applied.

Results

1. Video editing and Videotutorials

2. Audio editing and Podcast

The topics covered in the instrument were those mentioned above, where teachers participated as students of the workshop course with a Likert scale instrument.

In terms of perception, 100% of those surveyed consider that the degree of knowledge acquired is correct and acceptable; this will allow them to carry out the creation of multimedia didactic material and that, through the teaching and use of this tool, the participating teachers will be able to create their own video tutorials for the teaching of their subjects.

To the question "How difficult is it to use Audacity for audio production? The results indicate that 80% of the participants believe that the Audacity program is easy and that it fulfills the functions of audio editing, special audio effects, creation of karaokes, voice editing, trimming audio tracks, improving audio quality, making podcasts, methodology for making podcasts, which were part of the tools they were taught in the course-workshop.

When asked if they liked the Movavi video editing software, 100% said that it is a good video editing software and 75% said that they will use the program frequently. Also, the majority said that they have a very high level of proficiency in setting up a webcam, recording in a specific format, using transitions, using effects, adding subtitles to a video, vocalizing a video, and setting a video to music.

Conclusions

The use of videotutorial courses in HEI education is advancing more and better every day, with modern steps on the approach of strategies that really serve to achieve meaningful learning.

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Students demand more multimedia material and more interaction with technology in their classes, they require teachers better prepared in the field of educational technology but, who know how to focus that knowledge to the design of learning strategies such as the videotutorial, which well oriented and designed offer great benefits to teachers at the Autonomous University of Nayarit, especially for non-conventional modalities adopted by the pandemic.

At the time when the state of alarm by the pandemic, forces the entire educational system to adapt to distance learning, the first alerts focused on the lack of technological resources in the homes of teachers and students, aggravating this problem to a greater extent in rural areas where in many cases the Internet connection is deficient. Faced with these problems, as teachers, our contributions are highly conditioned and are sometimes limited to supporting the different measures and aids taken by the administrations. However, as Cabero and Valencia-Ortiz (2021) reflect: "the digital divide refers not only to access to technologies, but also to knowledge of them, that is, what we are able to do with technologies and for what purpose" (p.119), and this is the aspect on which the present study focuses.

At a general level, the results can be valuable for the university and non-university teaching community, by showing both an alternative and a complement to the development of synchronous expository sessions (face-to-face or virtual) that allows greater flexibility and control in the planning of the teaching-learning process. The evidences obtained indicate a high general satisfaction on the part of the students, mainly regarding the potential of this methodology for the resolution and understanding of the practical contents, facilitating the reflection and elaboration of personal syntheses. It is worth highlighting this issue initially, since the organization of practices and group work activities is one of the aspects in which a greater number of drawbacks are being detected when adapting face-to-face to other training modalities (Allen, Rowan, & singh, 2020; Sánchez-Prieto, Hernández-García, García-Peñalvo, Chaparro-Pelaez, & Olmos-Migueláñez, 2019).

Likewise, the results obtained show that the use of video tutorials in university teaching promotes and facilitates reflection, analysis and understanding of the contents of the learning units, which are necessary and priority skills in an educational system based on the development of integrated professional competencies. Throughout the work, it has been shown how teachers who took this training were not prepared for a new online modality, and in some cases have been overwhelmed by this new condition. Similarly, many teachers have experienced similar situations when increasing their workload (Allen, Rowan & Singh, 2020), being necessary to rethink not only the contents of the subjects (García-Planas & Torres, 2021) but also the methodologies and resources used.

The results obtained show a correlation between the satisfaction of the teachers who took the course with the use of video tutorials and their intention to use them in their future professional practice. These educational aspects are precisely those on which the use of this type of resources has the greatest impact, which may also indicate a possible influence by modeling on the students' teaching identity that should be explored in greater depth in future research. More specifically, it seems that the use of videotutorials is especially useful in the development of practices, since they facilitate students' generalization of theoretical contents to practical cases as well as the reflection and elaboration of personal syntheses.

This issue is of special relevance, as we find ourselves in a situation of deep concern and debate in the university community about the adaptation of the practices of the subjects to a blended and even non-attendance model. This work also makes an empirical contribution in the field of the development of personal teaching identity based on experiences as a student. The use of resources such as video tutorials, which focus the educational process on student learning rather than on the content itself or the work of the teacher and the teaching-learning processes by the educational community.

This is why the integration of this type of resources in educational processes generates added value not only at the micro level of the classroom-group, but also at the macro level.

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Despite the contributions made in this work, we must be cautious with the conclusions drawn, mainly due to the limitations related to the instrumentation and sampling applied. However, the effective use of video tutorials in HEI teaching implies both their adequate technical design and their correct planning and integration into the teaching-learning processes. Organizations dedicated to teacher training have the duty to adapt their teachings to the current contexts and needs, so there is a clear need to include and influence these issues within the processes of teacher training and professional development of teachers and future teachers. In fact, it should be remembered that the development of the teaching identity is influenced not only by experiences as a student, but also by initial and continuing education processes.

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