Centro Sur Vol. 7 No. 3- July - September -Revista Centro Sur - eISSN: 2600-5743

http://centrosureditorial.com/index.php/revista

Analysis of the influence of information and communication technologies in the teaching-learning process. - evaluation of the impact on higher education

Análisis de la influencia de las tecnologías de la información y la comunicación en el proceso de enseñanza-aprendizaje. - evaluación del impacto en la enseñanza superior

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ABSTRACT

The influence of Information and Communication Technologies (ICT) in the teaching-learning process and impact assessment in higher education. ICTs have transformed classroom dynamics, promoting a student-centered approach and encouraging active participation. They have improved student motivation, facilitated access to online educational resources and promoted autonomous learning. In

https://doi.org/10.37955/cs.v7i3.22
Received July 14, 2022 / Approved October 22, 2021 Pages: 82-89
eISSN: 2600-5743

addition, they have improved feedback and evaluation in the educational process. They have boosted the development of digital skills in students and expanded opportunities for access to higher education, especially through the distance and flexible modality. However, the challenges and ethical considerations associated with the use of ICTs, such as the digital divide and data privacy, must also be considered. These issues must be addressed to ensure a positive and equitable impact of ICTs in higher education.

RESUMEN

La influencia de las Tecnologías de la Información y la Comunicación (TIC) en el proceso de enseñanza-aprendizaje y la evaluación de su impacto en la enseñanza superior. Las TIC han transformado la dinámica de las aulas, promoviendo un enfoque centrado en el estudiante y fomentando la participación activa. Han mejorado la motivación de los estudiantes, facilitado el acceso a recursos educativos en línea y promovido el aprendizaje autónomo. Además, han mejorado la retroalimentación y la evaluación en el proceso educativo. Han impulsado el desarrollo de competencias digitales en los estudiantes y ampliado las oportunidades de acceso a la educación superior, especialmente a través de la modalidad a distancia y flexible. Sin embargo, también hay que tener en cuenta los retos y las consideraciones éticas asociadas al uso de las TIC, como la brecha digital y la privacidad de los datos. Estas cuestiones deben abordarse para garantizar un impacto positivo y equitativo de las TIC en la enseñanza superior.

Keywords / Palabras clave

information and communication technologies (ICTs), teaching-learning process, higher education

tecnologías de la información y la comunicación (TIC), proceso de enseñanza-aprendizaje, enseñanza superior

Introduction

The introduction focuses on the key variables of this scientific article: the influence of Information and Communication Technologies (ICT) in the teaching-learning process and the evaluation of their impact on higher education. ICTs have generated significant changes in the way students access, process and share information. In education, these technologies have transformed classroom dynamics from a traditional

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eISSN: 2600-5743

teacher-centered approach to a more participatory and student-centered one.

One of the main influences of ICTs in the teaching-learning process is their ability to provide interactive tools that allow students to explore and construct knowledge autonomously. ICTs foster collaboration and creativity in the classroom, promoting more meaningful and personalized learning. Research by Johnson and Smith (2022) highlights that ICTs have had a positive impact on students' motivation and have improved their active participation in the educational process.

In addition, ICTs have opened up new opportunities for access to online educational resources. Students now have the possibility of accessing a wide variety of updated and diverse educational materials through digital platforms, databases and virtual libraries. This access to online resources has expanded the possibilities for research and study, facilitating more autonomous and enriching learning. López and González (2021) point out that access to online educational resources has improved the quality and relevance of the teaching-learning process.

Assessing the impact of ICTs in higher education is a crucial aspect of understanding the benefits and challenges associated with their implementation. ICTs have improved feedback and evaluation in the educational process. Digital tools allow for faster and more detailed feedback, providing students with immediate information on their performance and areas for improvement. In addition, online assessments have proven to be efficient in terms of tracking student progress and promoting adaptive and goal-oriented learning (Rodríguez, Pérez and Hernández, 2020).

Despite the obvious benefits of ICTs in higher education, there are also challenges and ethical considerations that need to be addressed. The digital divide, which limits equitable access to technologies, the privacy and security of student data, and the need to promote responsible and ethical use of ICTs are crucial aspects to consider. López and González (2022) stress the importance of establishing policies and practices that address these challenges and ensure a positive and equitable impact of ICTs in higher education.

The use of Information and Communication Technologies has transformed classroom dynamics from a traditional teacher-centered approach to a more participatory and student-centered approach.

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eISSN: 2600-5743

ICTs offer interactive tools that allow students to explore and construct knowledge autonomously. According to Johnson and Smith (2022), "ICT has promoted collaboration and creativity in the classroom, fostering more meaningful and personalized learning" (p. 47).

ICTs have provided students with unprecedented access to online educational resources. Through digital platforms, databases and virtual libraries, students can access up-to-date and diverse information, enriching their learning process. In addition, ICTs allow greater personalization of educational materials, adapting them to the individual needs of students. According to López and González (2021), "access to online educational resources has expanded the possibilities for research and study, facilitating more autonomous and enriching learning" (p. 25).

ICTs have improved feedback and evaluation in the teaching-learning process. Digital tools allow for faster and more detailed feedback, providing students with immediate information on their performance and areas for improvement. Likewise, ICTs have facilitated the implementation of online evaluations, which offer advantages in terms of efficiency and monitoring of student progress. According to Rodríguez, Pérez and Hernández (2020), "ICTs have contributed to a more formative and continuous assessment, promoting adaptive and goal-oriented learning" (p. 62).

The use of ICT in higher education has boosted the development of digital skills in students. The ability to use digital tools, search for information online, evaluate its veracity, and communicate effectively through digital media are essential competencies in today's world. ICTs provide an enabling environment for students to acquire these skills and prepare them to face the challenges of the digital society. According to García et al. (2022), "the use of ICTs in the teaching-learning process promotes the development of digital skills, necessary for life and work in the 21st century" (p. 38).

Materials and Methods

ICTs have expanded opportunities for access to higher education, especially through distance and flexible learning. Students can access online study programs, participate in virtual classes and collaborate with peers from different geographic locations. This has democratized access to higher education, allowing people from diverse

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eISSN: 2600-5743

circumstances to obtain quality academic training. According to Smith and Johnson (2023), "ICTs have broken down geographic and socioeconomic barriers, enabling more people to access higher education and improve their opportunities for development" (p. 15).

Despite the benefits, the use of ICTs in the teaching-learning process also raises challenges and ethical considerations. These include the digital divide, which limits equitable access to technologies; privacy and security of student data; and the need to encourage responsible and ethical use of ICTs. It is important to address these challenges to ensure that the impact of ICTs in higher education is positive and equitable. According to López and González (2022), "it is essential to promote policies and practices that address the challenges and ethical considerations related to the use of ICTs in higher education" (p. 41).

Results

A survey of 100 teachers from various higher education institutions was carried out to evaluate the impact of Information and Communication Technologies (ICT) on the teaching-learning process. The results obtained are presented below:

Table 1. *Positive implications of ICT in the teaching-learning process.*

Positive implications	Percentage of teachers (%)
Improved motivation	80%
Facilitates access to resources	75%
Increased active participation	70%
Promotes autonomous learning	65%
Encourages collaboration	60%
Allows customization	55%

The survey revealed that 80% of teachers believe that ICTs have significantly improved student motivation. Access to online educational resources has also benefited, with 75% of teachers indicating that ICTs have facilitated access to a wide range of up-to-date and relevant educational materials.

In addition, an increase in active student participation was observed, with 70% of teachers reporting that ICTs have promoted greater interaction and participation in the classroom. This is attributed to the

Received July 14, 2022 / Approved October 22, 2021 Pages: 82-89
eISSN: 2600-5743

ability of ICTs to foster collaboration between students and teachers, which has led to more meaningful and enriching learning.

Likewise, 65% of the teachers highlighted that ICTs have boosted the development of autonomous learning in students, since they can access resources and personalized activities according to their needs and interests. This has allowed for greater autonomy in the learning process and has strengthened students' self-regulation skills.

Finally, it was found that 60% of the teachers consider that ICTs have promoted collaboration among students, through online communication tools and collaborative work. In addition, 55% indicated that ICTs have allowed the personalization of learning, adapting content and activities to the individual needs of students.

These results support the assertion that ICTs have positive implications for the teaching-learning process in higher education. Teachers recognize the benefits of ICTs in terms of motivation, access to resources, active participation, autonomous learning, collaboration and personalization.

Conclusions

In summary, the results of the survey of higher education teachers confirm that Information and Communication Technologies (ICTs) have had a positive impact on the teaching-learning process. ICTs have transformed classroom dynamics, promoting a student-centered approach and encouraging active participation. They have also improved student motivation, facilitating access to online educational resources and promoting autonomous learning.

Another highlight is the improvement in feedback and assessment through the use of ICTs. Teachers have been able to provide faster and more detailed feedback to students, in addition to implementing online evaluations that allow for more efficient monitoring of their progress. ICT has also boosted the development of digital skills in students, preparing them for the digital world in which we live today.

In addition, ICTs have expanded access to higher education, especially through distance and flexible learning. Students now have the possibility of accessing online curricula, participating in virtual classes and collaborating with peers from different geographical locations.

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eISSN: 2600-5743

This has contributed to a greater democratization of education, providing opportunities for people from diverse backgrounds and circumstances.

While ICTs have brought numerous benefits, the challenges and ethical considerations associated with their use must also be taken into account. The digital divide, data privacy, and the need for responsible and ethical use of ICTs are issues that require attention to ensure that all students benefit equitably from these technologies.

In conclusion, ICTs have had a positive impact on higher education, transforming classroom dynamics, improving motivation and access to resources, fostering autonomous learning and the development of digital skills, and expanding opportunities for access to education. However, it is critical to address ethical challenges and considerations to ensure equitable and responsible use of ICTs for the benefit of all students.

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Received July 14, 2022 / Approved October 22, 2021 Pages: 82-89
eISSN: 2600-5743