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Innovation in distance education

Innovación en educación a distancia

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Abstract

The implementation of distance courses has allowed knowledge to reach a greater number of students immediately, in addition to this, it allows us to access information at the convenience of the participants, so the specific schedules, which promote a greater opening in the accesses and the way in which knowledge can be generated, is not married to a place, a time or a style, which is why it is increasingly necessary to be able to implement strategies that In addition, they generate real knowledge and a substantial use of the contents that are being shown, together with a wide range of strategies that range from the topics themselves, the reinforcement of activities through innovative technological tools and feedback and/or relevant evaluations to indicate the level of achievement that the student had within the specified period and that will allow him to continue advancing to reach his goal. Objectives, Methodology. The main objective of carrying out this work is to show the importance in the implementation of distance courses with the use of technological innovation tools, the advantages of students learning according to their needs and the advantages of having these important tools. support in educational instruction; In addition to presenting a representative sample on the application of a research technique that allows us to observe -by its results- that distance education has had a beneficial impact even more with the use of technological innovation tools in terms of promoting this instruction. in Higher Education Schools. Contribution. It seeks to demonstrate in a broad way, that encouraging students who cannot attend school in the required times, to seek education online, can help them obtain a degree without having to put aside meeting their needs through a job, distance education, will allow them to satisfy their self-realization needs and they will be able to collaborate significantly in the achievement of their medium-term objectives

Education, Teaching-learning process, educational tools

Resumen

La implementación de cursos a distancia, ha permitido que los conocimientos puedan llegar de forma inmediata a un número mayor de estudiantes, aunado a ello, nos permite que el acceso a la información se realice a conveniencia de los participantes, por lo que quedaron fuera los horarios específicos, que promueven una mayor apertura en los accesos y la forma en la que se puede generar conocimiento, no está casado con un lugar, un tiempo ni un estilo, por lo que cada vez se hace más necesario, el poder implementar estrategias que además, generen un conocimiento real y un aprovechamiento sustancial en los contenidos que se estan mostrando, aunado a una amplia gama de estrategias que abarcan desde los propios temas, el reforzamiento de las actividades mediante herramientas tecnológicas innovadoras y las retroalimentaciones y/o evaluaciones pertinentes para indicar el nivel de aprovechamiento que el alumno tuvo dentro del periódo especificado y que le permitirá seguir avanzando para llegar a cumplir su meta. Objetivos, Metodología. El principal objetivo de la realización de este trabajo, es mostrar la importancia en la implementación de cursos a distancia con uso de herramientas tecnológicas de innovación, las ventajas de que los alumnos aprendan de acuerdo a sus necesidades y las ventajas de contar con estas importantes herramienta de apoyo en la instrucción educativa; además de presentar una muestra representativa sobre la aplicación de una técnica de investigación que permite observar -por sus resultados-, que la educación a distancia ha tenido un impacto benéfico aun mas con el uso de las herramientas tecnológicas de innovación en cuanto a fomentar esta instrucción en las Escuelas de Educación Superior. Contribución. Se busca demostrar de manera amplia, que el incentivar a los alumnos que no pueden asistir a la escuela en los tiempos requeridos, a buscar educacion en línea, puede ayudarles a obtener un título sin tener que hacer de lado el cubrir sus necesidades por medio de un trabajo, la educación a distancia les permitirá satisfacer sus necesidades de autorealización y podrán colaborar significativamente en el logro de sus objetivos a mediano plazo.

Educación, Proceso enseñanza-aprendizaje, Herramientas educativas, Innovación

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Introduction

This article focuses on the importance of providing students with adequate tools for specific situations, where the transfer to the places of study can be considered a problem that prevents the academic development in an adequate way, sometimes even encouraging desertion, it is important to highlight that since the pandemic, there has been a boom in all learning resources that have some innovative tools for support and study in distance education, It is important to emphasise that since the pandemic, there has been a boom in all learning resources that have some innovative tools for support and study in distance education, and that approaching classrooms and educational institutions is currently becoming easier and easier, therefore, part of the solution lies in giving importance to the approach of technologies, teacher training (no matter the profile of the teaching staff) and the adaptation of environments that allow a secure internet connection and thus avoid setbacks due to lack of connectivity.

The added value that this type of education will bring with respect to face-to-face teaching is precisely the fact that, without having a specific place and time, we can all have access to the contents in any situation, which translates into a better acquisition of knowledge and the fact that, with the use of innovative technological tools that can be included in the lessons, the student can reinforce what they have learned, self-evaluating and promoting individual development as part of their comprehensive training.

An integral education implies that we must stimulate all aspects of the human being (rational, emotional, social, physical, aesthetic and spiritual), to build people with individual, social, historical and planetary awareness (Colegio Chimalistac, 2023). (Colegio Chimalistac, 2023).

Figure 1 Student participation
Source: (Pinterest, 2023)

Therefore, this research will demonstrate that by using the appropriate resources, students can acquire study habits that allow them to satisfactorily complete their studies at a higher level, allowing them to climb up the career ladder satisfactorily, leaving aside the vicissitudes they face in their daily lives.

The role of the teacher

Talking about the teacher implies the idea that he/she is the person who inculcates knowledge, who is in charge of establishing guidelines and control within the classroom, we are used to the image that he/she is the one who guides, applies, evaluates and carries out eighty percent of the activities in the classroom; However, we must face the fact that this paradigm is no longer viable, especially because we are faced with the fact that we are dealing with "technological" students, people who are capable of finding their own way of learning and generating self-knowledge, which is why, as instructors, we must change the way we show our role in the classroom:

1. To begin with, the term CLASSROOM is being distorted, since it is not only the physical space located within an educational institution; a classroom can be any space (material or virtual), which allows the student to acquire knowledge and reinforce it as far as their time and abilities allow.

2. The TEACHER must be constantly prepared and updated in their area of expertise, as the ability to "know" is immediate; the internet brings people together in real time, which causes a change in the acquisition of learning; it is no longer necessary or essential to consult a book.

3. EDUCATIONAL FACILITIES, must be able to include within their facilities, workshops and laboratories that are adapted to the demands of today's working world, allowing students to practice and application based on real problems for effective solutions.

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Figure 2 Distance learning
Source: (Pinterest, 2023)

The teacher must promote interaction with the students as part of the teaching-learning process, the contents must show analytical development and the observation of events that keep the student's motivation and participation active at all times.

The role of the learner

In principle, we must understand that in this type of education, the student becomes a self-regulator of knowledge, that is to say, he/she has the facility to carry out his/her own cognitive process in the way that best suits him/her, depending on his/her free time and the digital tools available to him/her.

This type of learner must be able to move from the traditional role of student to the role of self-regulator of their learning, acquiring skills and gathering their own resources to be able to satisfy their information needs favourably, adequately managing the knowledge that impacts on the area of training in which they are; The main function of students is to always learn new things about different subjects or branches of science and art, or any other area that can be put under study (Concept/Definition, 2023).

A proactive learner is intrinsically related to the acquisition of knowledge, which will allow him/her to investigate, propose and implement effective solutions according to the given situation approach for its resolution, motivating him/her to show his/her true interest and desire to learn.

Undoubtedly, one of the main challenges faced by this type of student is the fact of setting personal goals, as not everyone seeks to achieve the same results and some are conflicted by not being accompanied by people of the same educational level. It is important to emphasise that in this type of learning, one cannot be passive or expect to be directed; again, self-management of knowledge is of great importance.

The fact that the actors in this type of education are located in different spaces sometimes makes dialogue difficult, so it is also very important to be able to manage asynchronously the perceptions at the right moment and at the right time for the integral education of the students.

Impact of technology on HEIs

Technology is having an accelerated impact on different areas such as education; in the pandemic it was observed that it was necessary to make use of various technological tools as part of the teaching-learning process, where at the same time teachers could meet the objectives they had set from the beginning of the school year. For Higher Education Institutions (HEI), it was no different as they also had to rely on technological tools to support the learning process and even more without neglecting the practical part, since in these institutions it is a priority because they teach careers at engineering level.

On the other hand, there are HEIs that offer distance engineering courses where the use of platforms must be applied, which have instructional designs for each subject, as well as innovative technological tools, which contribute to the practical laboratories that are compulsory in some subjects, as they reinforce the theoretical part that has been acquired.

Methodology to be developed in the distance learning classroom

In the IES that we will study, currently teaches distance careers which are, Engineering in Computer Systems (ISC) and Engineering in Information Technology and Communications (Tics), both in their reticles have subjects that are theoretical and other totally practical, that is where teachers have to work with virtual laboratories and other tools of technological innovation for students to have the necessary knowledge that is requested in its reticle of the engineering they are studying, For this reason, this research will be experimental in nature, as it will study whether the tools used have been favourable for the development and experimentation required in the practical part, so that students have the skills that will enable them to develop in their professional life once they have completed their studies, as well as the advantages of using these tools in educational instruction, observing their results and the impact of distance education.

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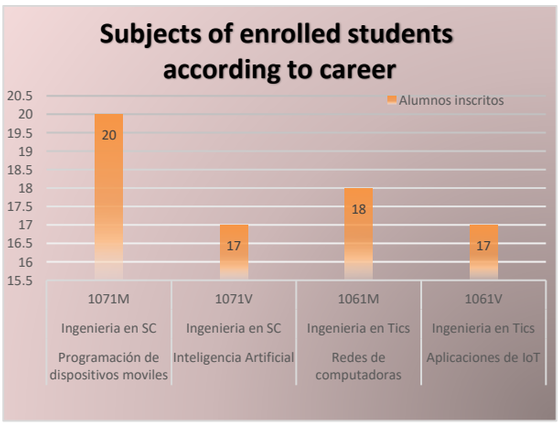
To begin with the research, we took as a sample subjects from each degree course that are totally practical and which require specific software to fulfil the competencies set out in each subject, then we will analyse the innovative technological tools on which the teachers relied and finally we will evaluate the use of each tool by the students.

In the ISC career, the subject taken as a sample was Mobile Device Programming and Artificial Intelligence, while in the Tics career, the subject taken was Computer Networks and IoT Applications; The subjects were considered because they have a high percentage of practice and impact according to their professional profile, as they are in advanced semesters, where later the impact of the knowledge acquired by the students can be evaluated, since at the end of the subjects a project will be requested where the use of the technological tools that were worked on during the semester will be implemented, likewise, an evaluation of the projects will be carried out, by teachers of the IES and invited entrepreneurs evaluating the impact of the use of tools of the projects as well as the feasibility of the same.

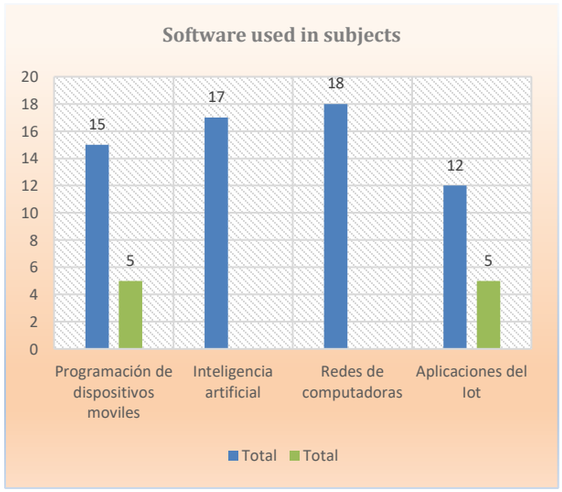
In the HEI where the research was implemented in period 22-2 there were the following groups, which took the sample subjects, as shown in graphic 1.



Graphic 1 Sampling of subjects and students
Source: (Escamilla, 2023)

Once the sample was taken, we began to investigate by means of an interview with the teachers who teach in these subjects, asking which were the technological tools on which they relied to be able to carry out the practical part requested by each subject, and the results obtained are explained below.

In the subject Programming of mobile devices of ISC, it was detected that group 1 uses the online program called APP Inventor, which is free software, with an environment to develop mobile applications with the Android operating system, they also make use of another program called iBuildApp, this software allows to create mobile applications in the same way for Ios and Android systems; On the other hand, in the subject Artificial Intelligence, group 2 made use of ChatGPT as it is an artificial intelligence application to engage in dialogue with users, while in the career of Tics in the group that took the subject Computer Networks make use of packet tracert this software is a simulator that allows the configuration and design of computer networks, And finally in the subject Iot Applications, they make use of two software in adafruit and thinSpeak which are software that are characterised by being Open Source that allows to store objects using HTTP protocol, so also allows to make simulation practices with arduino cards. All of the above can be seen in graph 2 below. It is worth mentioning that these softwares were proposed and used for having the characteristic of being free and portable on any device so that it is not complicated for the student.



Graphic 2 Software used in sample materials.
Source: (Escamilla, 2023)

Finally, as part of the research, a virtual session was organised in the company of four teachers from the same HEI and three invited businessmen, experts in the area of technology, who have requested students for professional internships; in this session the students presented their final projects requested by the teachers of each subject, so that they could evaluate the impact they had observed in the projects, their point of view on the tools used for their implementation, as it is a way of evaluating what the students can achieve in a working environment.

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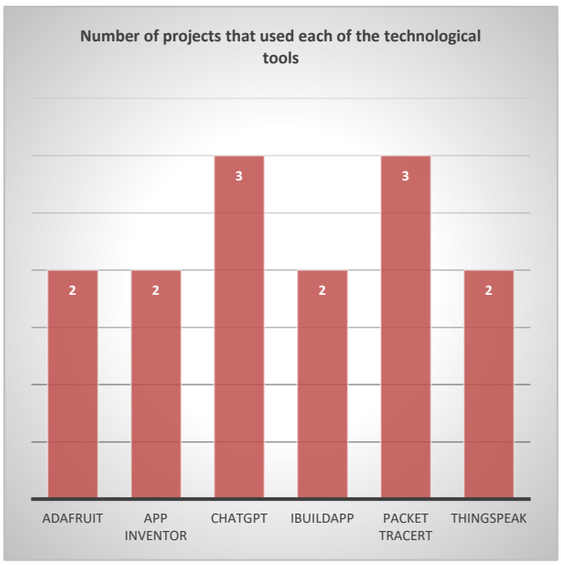
Fourteen projects were presented, of which graphic 3 shows which technological tool or software was used for development.



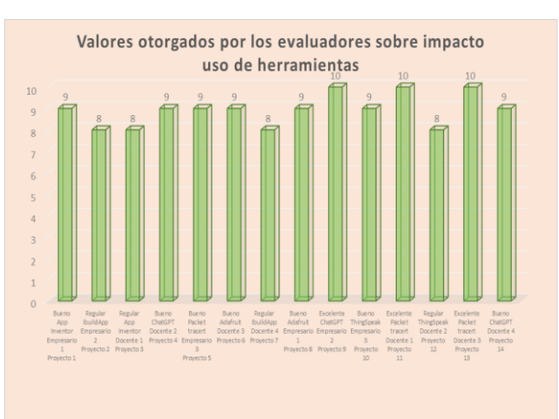
Graphic 3 Number of projects and tool they worked on
Source: (Escamilla, 2023)

Graphic 4 shows each of the values given to each project according to the impact of the technological tool used, where the values are considered according to table 1 below.

Evaluation	Range
Excellent	10
Good	8.5 – 9.9
Fair	7 – 8.4
Poor	less than 0

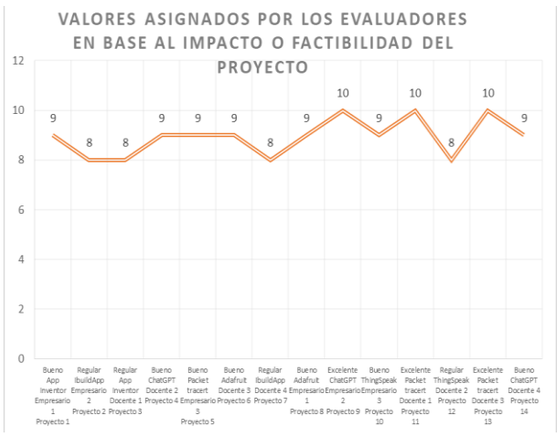
Table 1. Values considered in the evaluation scale.

As can be seen in the graph it is shown that in general the values placed by the entrepreneurs and teachers are good in the majority of the projects. This speaks of the fact that the tools used in the development of the projects are good or of impact for entrepreneurs and that they can be used as proposals for future projects that can be carried out with these projects.



Graphic 4 Evaluation assigned by the evaluators on the impact of the tool used in the project
Source: (Escamilla, 2023)

Consequently, the following graph 5 shows the impact or feasibility of the projects, which can be seen to be good and excellent according to the table of values mentioned above, since the evaluation given by the attendees considered the projects to be feasible to implement according to their areas of knowledge, which in this case is technological.



Graphic 5 Project evaluation based on impact or project feasibility
Source: (Escamilla, 2023)

Results

It can be observed as final results that the objective of the research was fulfilled, since it was possible to verify with the graphs that the innovative tools of which the teachers make use in their subjects at a distance, are of importance being demonstrated in each of the projects of the students, same that were exposed and of which the businessmen evaluated being these the ones that feedback that learning and impact that they have, likewise it was also shown that these projects have certain feasibility to be able to be implemented in the professional scope in the companies.

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