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Backward Design on Online Teaching for Spanish Technical Engineering Students

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ABSTRACT: Pedagogical practices in Spain maintain a traditional format in which the teacher is revealed as the neural axis of the teaching-learning process, limiting the student to a passive role in which they merely reproduce the knowledge transferred without being able to contribute new knowledge through critical, reflective and transformative postures. Added to this reality is the fact that teachers are not up to date in the use of new information and communication technologies. The general objective of this research is to propose the application of the Backward Design Method in a technical engineering degree in a Spanish university in order to develop the understanding and transfer of what has been learned in the English language. This research was carried out with the purpose of proposing solutions to problems caused at the time of developing the class regarding the teaching-learning of the English language.

KEYWORDS: Backward Design Method; Classroom Development; Online Teaching; Technical Engineering Degree

INTRODUCTION

The presence of Information and Communication Technologies (ICT) in the 21st century education is a reality that brings with it a series of challenges for both educators and learners; however, the advantages and benefits of exploiting ICT in the teaching-learning process are incalculable and, faced with such a perspective, teachers and pedagogues cannot remain indifferent. Since their appearance, ICTs have opened up new ways of teaching and learning, showing their great potential in the possibility of interaction, communication and access to information.

Nowadays, ICTs enable the creation of new learning environments, providing teachers with the opportunity to transform the educational process and improve the quality of education. In this context, virtual education appears as a flexible training modality that allows the student not only to access information, but also to transmit and produce knowledge based on data obtained through modern communication networks, regardless of the time or place where the people involved are, which gives more richness to the educational process.

In higher education, these systems present great opportunities for teachers and, above all, for students in terms of accessibility, flexibility of time, space, pace, timetables, etc. and in some cases costs[1]. These environments are becoming increasingly important, because to be active in the new social space requires new knowledge and skills to be learned in educational processes. The web has progressively gone from being a repository of information to becoming a social instrument for the elaboration of knowledge.

As Swan[2] points out, ICTs offer a range of possibilities through computer-mediated communication and virtual training environments for both distance and face-to-face education. Both modalities can benefit from the communicative possibilities offered by networks and the growing possibilities of multimedia systems, without forgetting that these new learning environments require new approaches to understand, design and manage them, because their use affects all the elements of the didactic process (teachers, students, contents, media, etc).

It is here where it is detected that the academic conception of the blended learning modality for the learning of Technical English is not in accordance with the expectations of today's society, because as it has been verified, it proceeds in the same way and uses exactly the same material of the classroom modality, leaving aside the use of tools that are supported by ICT in the teaching-learning process; for this reason, it is essential to find a solution to this pedagogical problem.

Under this approach, it is pertinent to highlight as a problem the deficiencies that are generated in the teaching and learning processes of the subject of Technical English, based on successful pedagogical models, with the use of current techniques and pedagogical means that are adjusted to the context of a modern student[3].

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This problem is generated by an inadequate use of the pedagogical models of teaching and learning, which involves the use of the New Information and Communication Technologies, without appreciating a correct management of traditional media and many of them outdated with texts that fail to capture the attention of students making computer learning a torture.

As it can be expected, this scenario, at certain times in an accelerated manner and at other times slowly, has led to unrealistic learning, alien to the real needs of modern society, generating in the students erroneous knowledge and a lack of knowledge of computing and therefore a total relegation of scientific and social advances, among others[4].

The lack of updating on technological advances produces demotivation in the teaching-learning process and prevents both the student and the teacher from being able to create and/or implement the new tools required by this new context of the information society. Thus, today we speak of the "Digital Divide" as the difference that exists between those people or institutions that can access the use of new technologies and those that cannot benefit from them[5].

Therefore, the general objective of the paper will be to analyse the impact of virtual environments on the didactics of the teaching and learning process of Technical English in the virtual education of technical engineering students at a Spanish university. It is important to emphasize that didactic media are currently revealed as a feasible and viable alternative to make meaningful learning feasible for students, taking into account that there is a full willingness on the part of students to use didactic media.

Some other specific objectives will be the following ones: to investigate the ways in which virtual environments are used in the learning of English by students; to determine the level of appropriation of teaching practice in relation to ICTs to be used in e-learning; to detect the teacher's difficulties and difficulties in the process of virtual teaching-learning of Technical English of the students.

LITERATURE REVIEW

This section defines the concepts of existing elements of the teaching practice. Considering that retrospective design is one of the first recommendations when establishing a framework for online classes, there are elements within these guidelines that need to be considered. For example, after determining the learning objectives to be targeted, the activities must meet certain specific characteristics.

Another aspect is general online considerations. As such, the research shows recommendations to be followed in terms of types of skills and objectives to be assessed. The construction of activities is included; this aspect is one of the steps in language learning planning.

2.1 Infopedagogy: ICTs in education

The purpose of using an infomedagogue in the classroom is to encourage interaction and participation of the majority of the participants so that they are more likely to pay attention to the teacher's various activities. The Ministry of Education considers information and communication technologies to enhance students' knowledge acquisition and motivation, making their use an integral part of the curriculum.

Info-pedagogy is a combination of information technology and pedagogy that improves the quality of education through technology-integrated programmers. Info-pedagogy focuses mainly on the introduction of teaching methods and information and communication technologies (ICT), where the teacher must be trained to have real knowledge in the classroom and be able to process these technologies appropriately[6].

The role of the teacher is to develop educational projects based on technology, in addition to traditional teaching; he/she is the creator of learning strategies that must accompany the student in the new active processes of which the student is the main researcher. By using technology, students process new information and enrich their knowledge[7]. The teacher is the main axis for introducing new tools in the teaching methodology, such as the teaching method, the implementation of the activities and the distribution of tasks among the participants, as previously defined in the school programme.

Virtual education is an educational strategy that facilitates information management and enables new teaching methods to develop participatory and learner education. It improves the quality of face-to-face meetings, aligns with students' personal schedules and fosters continuous interaction between peers and teachers through virtual resources (Brown, 2014). Also known as e-learning, it refers to the development of learning, learning dynamic that is almost on-going. This means that there is an educational format in which teachers and students can interact rather than face-to-face.

It is based on ICT (Information and Communication Technologies) because it uses the tools offered by the Internet and new technologies to create an appropriate learning environment. It is worth remembering that virtual education is linked to distance

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education, which arises from the demand for high quality education for people who cannot access a physical education due to distance and time. E-learning complements this type of academic model by increasing the learning dynamics of students and providing teachers with greater support in their academic development and monitoring responsible students.

The growing popularity of mobile technologies (phones and tablets) and the almost unlimited access to Internet connections from anywhere we use nowadays, has enabled a new approach to e-learning, called mobile learning. Mobile learning offers more personalized learning in all situations and makes use of the different learning contexts offered by our daily lives.

The educational application is a multimedia program designed to be used with electronic devices and as a mobile educational tool. Using the Internet and cloud storage, we can communicate in real time and receive large amounts of information on demand, which facilitates data exchange and maintains communication; you can now consolidate a whole world of tools and accessories on a single device.

Since most industries are now looking for ways to update their processes and keep up with technological trends, the education sector emphasizes that technological tools are no longer a luxury for the environment and the community, but are now indispensable. The tools with which educational institutions seek to provide better services must make more efficient processes, interact with their community or disseminate information appropriately.

Platforms that store data and desktop computers that crave interactivity and keep up with innovation are no longer the needs of the industry today. The platforms currently used in the education system are focused on controlling schools, including a number of administrative functions where they can receive messages to help them make internal decisions and insert data of interest to them, managers and administrators into their processes.

Now the sector is going further and in this new era is trying to revolutionize services and contribute not only to the improvement of internal control processes, but also to find ways to create communication channels in 'teaching' establishments, incorporating and interacting through applications with different entities.

The integration of information and communication technologies (ICT) in education has gained importance and developed in recent years; after the entertainment market, education is the second sector with the most mobile applications. We are currently receiving applications from the education sector: online education, science, communication, monitoring, etc., where learning is most likely to be mainly linguistic[8].

The relevance of information and communication techniques in education and in society is unquestionable, as it is increasingly demanding policies at the technological level according to the advance of technology and new media; for this reason, no educational higher institution should be left out of the contributions and applications provided by the new information and communication technologies for education.

One area strengthened by information and communication technologies is CSCL (Computer Supported Cooperative Learning). Based on the theories of cognitive psychology with the aim that groups with a common interest learn to improve interactions with each other to enhance learning, using ICTs for coordination. ICTs include several aspects to be taken into account, especially when it comes to pedagogically oriented tics, as they use the instrumental curricular methodology based on competences, where the use of information and communication technologies is essential to conceptualize contents.

Digital competence encompasses a variety of skills, since it takes advantage of pre-existing skills and creates new ones that are innate to each person, as well as potentiating existing ones, and there is mutual collaboration, being unique for both teachers and students[9].

Today, the teachers' main function is to help students learn to learn independently in this culture of change and to promote their cognitive and personal development through critical and application activities that, by exploiting the immense information available and powerful ICT tools, take into account their characteristics (learner-centred learning) and require active and interdisciplinary processing of information to build their knowledge and not limit themselves to the simple passive reception-memorization of information.

The new role of the teacher is essentially to develop an autonomous learner, able to learn to learn, able to obtain and organize information; to distinguish between fact and fiction, primary and secondary sources, correlations and causation, direct statements and assumed meanings; to recognize biases and make global comparisons; to identify and develop unconventional solutions; to form and defend an opinion; to solve problems independently and demonstrate responsible.

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Digital skills are one of the 8 key skills that every young adult person should develop after completing compulsory education in order to successfully enter adulthood and to be able to develop lifelong learning according to the European Parliament's guidelines on fundamental skills for lifelong learning.

Digital competence not only offers the possibility to take advantage of the many new opportunities associated with digital technologies and the challenges they pose, but is also becoming increasingly necessary for meaningful participation in the new knowledge-based global economy and society of the 21st century[10]. Therefore, educational standards should include knowledge and skills that can help students develop new skills required in modern society, which are enhanced by technology, especially those related to knowledge management.

2.2 Backward design

Backward Instructional Design is based on being very clear about the learning outcomes we want our students to achieve. We must start from these, not from the content to be taught, nor from the textbook index, to begin to design the assessment. We plan backwards from the end and the end is to understand and transfer, the end is not to cover the content, nor to finish the program or the textbook. Therefore**,** the teacher should use the textbook as a resource, not as a guide to be followed literally.

Based on the meanings established in the previous quotes, we can contribute to this explanation with our own ideas by stating that in the challenge of teaching, teachers often get used to jumping into lessons and activities before clarifying the goals or objectives to be achieved in the class. Contributing to our own meaning we can say that the Backward Design Method is a process of curriculum design that focuses on setting objectives, creating or planning different types of assessment and finally planning a lesson plan so that learning is sustainable.

The Backward Design Method was introduced by Ralph W. Tyler without its present name being taken into account as it was known in the 1949's as set objectives since it was a way of indicating the changes that can be brought about in students by applying activities that are particularly derivative in order to reach the class objective. Thus, the term Backward Design was adopted by the writers Jay McTighe and Grant Wiggins in their book “Understanding by Design” in several of its current editions, such as the last one published in 2005. The Backward Design Method is a curricular design which has become one of the most important elements for the correct development of a class[11].

The compendium of documents is where the ideas about the people we want to train as future citizens are translated into goals, objectives or purposes of the system, and also where the contents that are considered important for this previously outlined human profile are brought together. Methodology, assessment, resources, and organisation comprise another list of factors that are also reflected in this curriculum[12].

All curriculum design is based on a process which the essential part of a lesson when teachers call on students to assimilate and apply the information presented in the content. In this way we can make an analysis defining that process is taken as a method of transmitting knowledge, which was acquired by teachers and which is essential for a class to achieve its stated objectives: “Teachers spend time thinking, first, about what to do in class, what materials to use, and what activities to assign to their students, but not about what the student needs in order to achieve the class objectives”[13].

The teacher's role often focuses solely on the use of a textbook to teach a class or lessons and activities that include worksheets for the sake of completing class time, i.e., *input.* Why spending time rethinking lesson planning? While in teacher training, we learn how to plan a lesson, in designing a sequence of activities we often forget the fundamental question: What do we want our students to learn, how will we know that they have achieved the required learning indicators, and how do we expect them to learn? And most importantly, how do we expect students to demonstrate that learning? The Backward Design Method derives its importance from the achievement of the desired results, i.e., the *output;* it focuses more on student learning without neglecting teaching by the teacher.

As for the advantages, students know what their final objectives are, how their learning will be assessed and how they will be guided towards learning success. Students reveal their understanding of learning when they are provided with authentic opportunities to explain, interpret, and change perspective and self-knowledge. The process of planning with the Backward Design Method means that the simple coverage of a lecture text is avoided and activity-oriented teaching is given in order to move towards broader, experiential learning. Assessment is designed before lesson planning, so that instruction leads students to the essence of what they need to know.

The teacher knows where they are going before they start the lesson. The assessment is already completed before the lesson starts, so it is easy for the teacher to make sure that the most important points of the unit are covered. It doesn't matter how you are working as

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long as you have an end result in mind. You can derive a series of well-planned activities that show that you are filling in the gaps in the unit you are dealing with and that you are working on what the student really needs to learn and not focusing on what the teacher necessarily has to teach, that is where the student applies that knowledge in a real situation.

Rauch[14] argues that the Backward Design Method can have a number of disadvantages, which he calls dilemmas, out of which stand out:

- Dilemma 1: Outcomes or displays? Although teachers design a list of desired outcomes, the classroom process needs to be dynamic and manageable for the teacher, as the lists often get out of control. A possible alternative solution is exhibitions where students have the opportunity to present their work and demonstrate that they have actually achieved the desired outcomes.
- Dilemma 2: Local authority or "remote control"? This difficulty is based on the fact that the principles framed for planning with the Backward Design Method often emerge from abroad (specifically from the USA) and their adaptation to local needs does not always have a positive result. It is therefore necessary to study the national educational reality in order to be able to work effectively with the Backward Design Method.
- Dilemma 3: Rigid or flexible standards? Each individual is original and unique with his or her own type of intelligence that helps or hinders the process of acquiring information. That is why Masinde, proposes the possibility of "making standards more flexible and taking into account the learning styles of each individual"[15].
- Dilemma 4: Assessment apart or authentic? Traditional assessment in the Backward Design Method involves adhering to standardized parameters, which leaves out working with alternative techniques.

And according to Pavlišáková, the Backward Design Method is summarised in 3 steps:

- **Step 1: Identify desired outcomes.** *What concepts do we want students to understand? What competences,* skills or procedures do we want them to learn? At first glance, this may seem like something we all do every time we teach. However, it must be taken into account that the objectives must be formulated correctly and specifically responding to the class we teach, in terms of what we expect students to learn, how far we want students to go in understanding these concepts or in developing these thinking strategies or skills. In other words, it is the teacher's responsibility to cut back on objectives that do not meet the learning needs of the students and to do so in a very conscious way. Is it worthwhile to include many objectives in a lesson or to include fewer but with more impact? Which concepts are key and which are lateral or superfluous? Is the age of the students appropriate for understanding something of this complexity? As you can see, choosing "where we are going" represents an important challenge because it will determine what students take away from class and, above all, how we teach it.
- **Step 2: Determine knowledge.** *How do I know that students are learning what I want them to* learn? What do we accept as evidence of what the student has learned? This is where the logic of what we do as teachers have to do to realise what the students are learning? What should we observe from what the students do and say to realise that they learned what I wanted to teach them? Again, this seems extremely logical and usual in teaching, but in practice it rarely is. Thinking first about what evidence the students should give so that the teacher realises what is going on inside the students' minds is of enormous help in planning, and then how to teach. For example, if I am interested in students learning how to design controls, I need to generate multiple situations in the classroom in which they have to design experiments with controls. From this perspective, you have to realise what the students are learning, whether what is going on inside their heads is closely related to the teaching process. Moreover, knowing what they are learning is an indispensable tool in this process.
- **Step 3: Plan activities.** *How can students demonstrate or apply their knowledge so that it* is evident that they have internalized the key ideas and have given up mistakes or misunderstandings that they have brought to their learning? This is the part where every teacher usually starts. We have to teach a certain content, what activities should we do? When you start with activities, there is a risk of losing coherence along the way. A little bit of one thing here, a little bit of another thing there. And in the end, we assume that the students have "seen" the topic when, in reality, they have never followed an orderly progression towards building a concept. It is easy to fall into the temptation of working on a subject by mixing a lot of impressive and attractive activities, but without being clear about how they produce the desired changes in the students, how they articulate with each other, what bridges need to be built between them and which ones simply touch on the side of the subject we want to teach but without going to the heart of the matter.

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In this somewhat fruitarian teaching unit, students began by opening an apple and drawing its parts, then learned about early apple planters and growers and their harvest. At first glance this sequence might seem interdisciplinary and it was probably very entertaining for the children, but a closer look raises a question. What did they learn in this collage of activities about apples? And a further reflection, what are the important things a child should know about apples? How should these important things be reflected in a teaching sequence?

On the contrary, if we think about teaching from the objectives and the evidence that the objectives were met, planning how we reach those objectives becomes, on the one hand, simpler and, more importantly, helps us to make the final product we arrive at more coherent, with all its components genuinely aligned.

EXPERIMENTAL FRAMEWORK

The research methodology used for the paper is quantitative, as it allows for the extraction of results from surveys of the population in order to improve higher education. This allows access to information by collecting data on variables, drawing some conclusions by comparing statistics. This method will be used to obtain a more representative percentage, where teachers have more difficulties.

The research level of the paper is purely descriptive since it consists of characterizing the fact, phenomenon, individual or group, in order to establish the structure. Descriptive studies measure variables independently, and even when assumptions are not formulated, these variables are indicated in the search tasks. This type of research will determine the different shortcomings that teachers have in their knowledge of pedagogical areas. In order to obtain the different data, a field study will be carried out in order to have an adequate collection and to be a direct participant with those involved.

As for the field of research, it consists of collecting data directly from reality, where events occur, without manipulating or controlling any variable; the researcher observes the academic progress of the group and the factors that influence it. However, the researcher does not control any factor because he/she cannot intervene in the cases.

According to Ledford & Gast[16], field studies can be extended when they are carried out on complete samples and population groups (censuses); and intensive, when they concentrate on specific cases, without the possibility of generalizing the results, using in this research the calculation of a sample.

On the basis of the research, it can be stated that it is a field research as the data collection will be taken from the teachers of the institution in a determined time, where they will make known with the different answers the factors where there is more difficulty of knowledge or where they need a greater reinforcement.

According to Flick[17], we can say that it is field research of a projective nature because it proposes solutions to a given situation based on a process of enquiry. It involves exploring, describing, explaining and proposing alternatives for change, but not necessarily executing the proposal.

According to Chambliss & Schutt[18], techniques are the means used to collect information, among which observation, questionnaires, interviews, surveys, etc., stand out. Therefore, in this research we will use the survey as a study technique. A survey is understood as a technique that aims to obtain information provided by a group or sample of subjects about themselves or in relation to a particular topic. In order to apply this survey, the focus is on a questionnaire, which is a written survey instrument consisting of a series of questions.

The reproduction of the research instrument was developed from photocopies of the original survey, taking into account that the quality of the copies was optimal so that there is no possibility of errors at the time of its application, guaranteeing a high level of reliability of the instrument applied.

The pilot test was carried out with 90 students in a technical engineering degree in a public Spanish university with the aim of revealing any type of error in the formulation of the questions or aspects that are not understandable, so that when the final survey is applied, effective and efficient results can be achieved in order to obtain the required result more quickly. The Cronbach's alpha test was carried out to verify the reliability of the instrument, as shown below:

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Table 1. Case Processing Summary

		N	
Cases	Valid		100,0
	Excluded	0	,0
	Total		100,0

Source: Own elaboration

Table 2. Reliability statistics

Cronbach's alpha	*N of elements*
,925	

Source: Own elaboration

Table 3. Total element statistics

	Scale average if the element has been removed	*Scale variance if the element has been suppressed*	*Total correlation of corrected items*	*Cronbach's alpha if the item has been removed*
Item 1	32,63	47,482	,219	,931
Item 2	32,93	45,237	,792	,919
Item 3	32,97	45,482	,794	,919
Item 4	32,80	45,959	,496	,924
Item 5	32,77	44,254	,725	,920
Item 6	32,83	45,523	,657	,921
Item 7	32,87	42,947	,858	,917
Item 8	32,73	49,926	-,040	,936
Item 9	32,67	45,402	,413	,928
Item 10	32,93	45,237	,792	,919

Source: Own elaboration

Once the Cronbach's alpha test was carried out, the reliability index was established at 93%, thus verifying the viability of the instrument. Once the pilot test had been applied, it was determined that there were errors in understanding the content of the survey questions, so the following definitive survey was created.

The software used was SPSS, one of the most widely used statistical programmers currently used in the exact and applied social sciences, which accurately reflects the market orientation, a program that allows the development of a univariate analysis, with which the correlation of the variables investigated could be verified.

The information was coded by establishing the name or nomenclature of the variable, type, question or label, values and mean, using the SPSS program. The information was entered into the SPSS version 23 system by typing in the responses using the codes assigned for each of the alternatives.

The analysis of the report corresponds to the univariate descriptive type through the results obtained from each of the questions asked in detail, which is responsible for measuring the relationship between the variables analysed, using the information extracted to create tables and graphs that show the information in a clear, pleasant and easy-to-understand manner.

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RESULTS

33% of the teachers surveyed consider that they always transmit their knowledge effectively, 67% sometimes, 100% of the teachers surveyed consider that they will always be a fundamental part of knowledge construction. 67% of the teachers surveyed believe that their students' learning would be enhanced if and when there is cultural immersion with English speakers, 33% sometimes.

100% of the teachers surveyed consider that they are not aware of the Backward Design Method and the participation strategies involved in this method. 100% of the teachers surveyed state that they have never used active methodologies that allow the attention level of their students to be prolonged, while 33% of the teachers surveyed consider that they always correctly apply the learning phases with their students, whilst 67% sometimes.

100% of the teachers surveyed agree that they always focus their attention on achieving the objectives set at the beginning of the class, while 67% of the teachers surveyed consider that when executing their classroom plan, they always encounter problems, and 33% sometimes. As well as 33% of the teachers surveyed think that they would like to adapt their classroom plan design in such a way that it is a solution to achieve the objective of their class, for 67% sometimes.

Most of the students surveyed consider that their learning always takes place within formal education following the teaching-learning standards with their due management of curricular plans, considering this according to the Classification of Learning Activities (CLA) manual. The Spanish Ministry of Education deduces that formal education corresponds to the programs leading to the main national school or university degrees. However, according to this definition, formal education is that which is given in official education, while non-formal education is that which is given as part of a short training, certificates or diplomas obtained in short courses.

The amount of data obtained is negative in that 42% of students consider that their teacher never transmits knowledge effectively. A good teacher is one who prepares his classes well, who explains himself well, who reaches his students, that is to say, a good transmitter of knowledge and values. We should be able to facilitate learning and be proponents of new learning contexts so that in this way students are able to face the challenges of everyday life.

Most of the students surveyed agree that the teacher will always be a fundamental part in the construction of knowledge. This research emphasizes the teacher's effort during the course of the teaching-learning process because behind everything there is a number of factors that are connected for a good construction of knowledge (formulation of objectives, selection of content, planning of activities and evaluations, etc.). In addition, it should be emphasized that the psychological part plays an important role, it is necessary to motivate the students in order to maintain the full concentration required in this process.

Nowadays, the level of the English language that a person holds defines his or her self-education. It is important to look for methods or strategies that allow our level of English to improve, and one of the solutions to this dilemma is based on cultural immersion with foreign people, since it is true that the environment in which the acquisition of a foreign language is developed influences too much. This is so because more than an obligation it has become a necessity being in contact and having to communicate with a foreign person is a great support for the acquisition of vocabulary or phrases.

Most students are unaware of the participation techniques that their teacher uses in the development of the class; this is due to the fact that the teacher has focused only on teaching knowledge but not on the students' learning. It is important that the teacher is a guide to improve the quality of student participation in group work, in the construction of a participatory and creative environment. For a lesson plan to work properly it is necessary to use a method that allows the attention within the class to be permanent. If the teacher does not know how to manage a correct teaching method responding to the needs of their students, it will be useless, since behind every activity or the use of tools there will always be a good management of a method.

From the point of view of the percentages of the respondents, a large number consider that the teacher never makes a correct use of the learning processes, that is why the knowledge is not lasting, and much less transferable. In order to achieve an adequate level of knowledge it is necessary to follow a line that leads us step by step the process of acquiring ideas that will be previously transmitted. A large percentage of the respondents stated that their teacher does not focus on achieving the objectives that were set at the beginning of the class. One of the factors that influence this gap is that the teacher does not take into account the different needs of each of their students, since most of the time the objectives are written to be learned by heart but not to be applied in daily life.

A considerable percentage of students consider that when they do not understand a class dictated by their teacher, they look for alternative solutions, which are different variables or ideas that help them individually or in groups to clarify situations that could

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not be understood by the traditional way. Based on the percentage obtained, we note that there is a great majority of students who affirm that their teacher does not look for ways to improve the level of understanding and transfer of learning.

DISCUSSION

According to the data collected, it can be deduced that most of the teachers mention that they teach their English classes within a formal education, which makes the classes boring for the teacher and the students. With the results obtained, it is concluded that the majority of teachers mention that they only sometimes transmit their knowledge in an effective way due to the lack of knowledge of adequate methods for teaching the English language.

Most teachers consider themselves a fundamental part in the construction of knowledge, since if there is no teacher and student within the educational process, there is no education. Most teachers agree that there should be a cultural immersion in order to increase the level of the English language, both in the acquisition of vocabulary and in the development of pronunciation.

The results obtained in the survey show a great disadvantage since most teachers are not familiar with the Backward Design Method and its participation strategies. Considering the surveys, it is assured that most teachers sometimes use active methodologies that allow the level of attention of their students to be long lasting, which is a fundamental part in the development of understanding and transfer of learning.

The majority of teachers consider that sometimes they make a correct application of the phases of learning. It is important to keep in mind that if you want the knowledge of students to be given in a clear and concise manner it is necessary to correctly apply the stages or phases that involve learning. As a teacher, achieving the objectives of a class will always be the most fundamental part since it is the evidence that the class has been taught and developed in the most correct way possible, so most of the teachers surveyed agree that they always focus on achieving the objectives of the class they teach.

One of the difficulties in implementing a lesson plan is the failure to achieve the objectives set from the beginning, the lack of time or the high level of irresponsibility on the part of the student body, which is why as a teacher you must be prepared to face such difficulties. With the sole purpose of responding to educational needs and making learning lasting and not fleeting, most teachers respond positively to the fact that they would like to adapt their classroom plan design so that it is a solution to achieve the objective of the class.

The lack of knowledge of the process of applying methods that allow to effectively achieve the objectives of a class, and also improve the level of understanding and transfer of English language learning, leads to propose a different vision of curriculum planning which helps to improve the quality of education and make English language learning more concrete. Thus, this proposal will present a curriculum planning guide based on the Backward Design Method, which allows improving the level of comprehension and transfer of Technical English language teaching.

The choice for planning with the Backward Design Method is due to the fact that it changes the teacher's scheme. Traditionally, curriculum design begins with activities that must necessarily be covered by teachers, leaving the assessment process as the last step. The Backward Design Method helps teachers to be clear about the objectives they want to achieve, to establish their vision (enduring understanding) of the topic they are going to work on, to decide how their students are going to evidence their learning and finally to design instructional activities that help students learn what they really need in order for them to significantly improve their English language proficiency. Today, simply providing knowledge is not enough, but rather encouraging students to be inquisitive, creative, and open-minded in their acquisition of new knowledge.

CONCLUSIONS

Once the problem had been determined, the theoretical framework developed, the hypothesis stated, the objectives defined, the study variables identified and the quantitative-qualitative results of the research determined, some conclusions were reached. The impact of virtual environments in the didactics of the teaching and learning process of a second language in the virtual education of technical engineering students is revealed as inefficient since the correct and systematic use of this pedagogical tool by the teachers of the English language specialty has not been verified.

The use of virtual environments in the learning of Technical English by these students is limited as a result of the resistance of the English language teachers to vary the traditional pedagogical methodology currently used, so that the objective of achieving a meaningful education is not achieved, which has a negative impact on the learning level of the students.

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There is no level of appropriation of the teaching practice in relation to ICTs to be used in e-learning by the students, a situation that derives from the lack of knowledge of teachers in the use, advantages and application of ICTs and e-learning in such a way that these methodological and pedagogical tools are not used, which is an insurmountable obstacle to achieve comprehensive training in Technical English language of students.

Marked difficulties are evidenced on the part of the teachers and in the process of virtual teaching-learning of Technical English of the students due to the teachers' lack of knowledge in the use, advantages and benefits of the virtual learning techniques, situation that derives from the application of traditional teaching methods, limitation of technological resources and methodological and pedagogical lack of updating of the teachers in virtual learning.

Among the limitations that hindered the development of the research was the lack of knowledge in the use of new information and communication technologies as a vehicle for transferring knowledge of the English language, as well as the lack of technological resources to achieve an effective materialization of online teaching.

It is also important to take into account the lack of a pedagogical methodology that standardizes online teaching, a situation that creates mistrust among teachers when using this strategy. Finally, it is worth mentioning the lack of training processes for teaching English with the help of information and communication technologies, which translates into shortcomings and lack of knowledge of this new teaching methodology for teachers.

It is known about the deficient application of teaching methodologies within the institution, which leads to the continuous application of traditionalist and monotonous methods that prevent the development of the teacher's objective. The lack of research culture in deepening the knowledge about methodologies that can be applied in the teaching-learning process, because sometimes we do not know how they are used and the steps to follow to apply them, results in positive or negative learning.

There is also a lack of previous knowledge of the Technical English language due to several factors and this is reflected in the grades because the student is not able to express or transfer their knowledge in English. Another factor is the non-application of learning in real situations that leads to mechanical memorization and uncritical students, if there is no interest in teaching from experiences, there will be students who see the Technical English language not as an opportunity but as an obligation they have to learn.

With the application of Backward Design on Online Teaching it will be achieved a significant increase in the cognitive abilities of technical engineering students in such a way that the projected objectives for a meaningful Technical English language education will be reached. We will also obtain a substantial improvement in the development of the teachers' abilities when interacting with the contents to be taught, actions that will enhance the teaching-learning process and consequently the quality of education.

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