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Journal of University Policies

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The works must be unpublished and refer to topics of University educational planning, philosophy from the university educational point, social participation in the benefit of university education, equity and university educational coverage and other topics related to Social Sciences.

Presentation of Content

In a fist article we present, *Education in pandemic times: A student vision of the contrast between presential and online education* by ORTIZ-SANCHEZ, Pedro Alfonso Guadal, SÁNCHEZ-ITURBE, Patricia Guadalupe and ORTIZ- Y OJEDA, Pedro Tomás, with asdcription in the Instituto Tecnológico de Mérida and Instituto Tecnológico de Tuxtla Gutiérrez, as the next article we present, *Formative assessment for virtual education in professional studies* by RIVERA-GUTIÉRREZ, Erika & HIGUERA-ZIMBRÓN, Alejandro, with asdcription in Universidad Autónoma del Estado de México, as the next article we present, *Has enough been done in plastics recycling?* by ORTEGA-CHÁVEZ, Laura Antonia, GALLEGOS-OROZCO, Carmen Angelina, AGUIRRE-GRANADOS, Mónica Patricia and HERNÁNDEZ-RODRÍGUEZ, María Guadalupe, with asdcription Instituto Tecnológico de Chihuahua II, as the last article we present, *Teaching practice in higher education. Analysis from educational models* by JASSO-VELAZQUEZ, David, ACOSTA-DE LIRA, Jorge Armando and FUENTES-FAVILA, Luis Macario, with asdcription in Universidad Autónoma de Zacatecas.

Content

Article **Journal of University Policies**
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Education in pandemic times: A student vision of the contrast between presential and online education

La educación en los tiempos de pandemia: Una visión estudiantil del contraste entre la educación presencial y en línea

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Abstract

With the goal of know and evaluate the face-to-face education previous to the pandemic and contrasting it with the education accomplished during the COVID 19 pandemic, this research was carried out on undergraduate students. A survey was applied, previously validated (Ortiz-Sánchez *et al*., 2021), the results allow to know aspects related to ideas that students have expressed during the exercise of online classes and in pre-pandemic. The research was carried out with students of different levels and areas of academic preparation. The results show that in higher education there is a great sense of adaptation to both forms of learning, with a slight tendency to be more interested in face-to-face education, with no significant differences between the opinions shown by the results between online education and face-to-face education. The known of these data can provide the establishment of actions and direction to appropriate methodologies for the future development of the emerging mixed education.

Exploration, Attitudes, Education.

Resumen

Con el objetivo de conocer y evaluar la educación presencial previa a la pandemia y contrastarla con la educación llevada durante la pandemia del COVID 19, se realizó la presente investigación a estudiantes de Licenciatura. Se aplicó una encuesta, validada previamente (Ortiz-Sánchez *et al*., 2021), los resultados permiten conocer aspectos relacionados con ideas que manifiestan los estudiantes durante el ejercicio de clases en línea y en prepandemia. La investigación fue realizada con estudiantes de diferentes niveles y áreas de preparación académica. Los resultados muestran que en educación superior existe gran sentido de adaptación a ambas formas de aprendizaje, con una ligera tendencia a interesarse más por la educación presencial, sin haber diferencias significativas entre las opiniones que muestran los resultados entre la educación en línea y educación presencial. Conocer estos datos puede proveer el establecimiento de acciones y direccionar metodologías adecuadas para el futuro desarrollo de la emergente educación mixta.

Exploración, Actitudes, Educación

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Introduction

Faced with the COVID 19 pandemic, educational institutions have implemented programmes to continue virtual education through the use of Information and Communication Technologies (ICT), tools that have been indispensable for communication between teachers and students.

On the other hand, the different manifestations of the crisis that this pandemic has caused (Chiappe & Wills, 2022) have been recently exposed, including problems related to the workload and lack of digital preparation of teachers, mental health, social and economic aspects and above all educational aspects, highlighting numerous weaknesses in the educational and social systems. Since there was no defined strategy to follow when distance education was initiated, let alone how to deal with the problems that arose.

Few exploratory studies are known of the opinions of the different actors in the higher education sector: students, teachers and administrative staff, related to the necessary competences they had to have in order to develop a different educational process during the pandemic, such as connectivity, lack of technical resources, among others. In Mexico, INEGI, a government agency, applied the survey via telephone (INEGI, 2021); it inquired about the advantages and disadvantages of distance and virtual classes for households with telephones and population aged 3 to 29 years old. Among the main advantages mentioned were not putting the students' health at risk (56.4%), family coexistence (22.3%) and saving money on various expenses such as fares and school materials (19.4%). Disadvantages were also mentioned as: not learning or learning less than face-to-face was the most mentioned with 58.3%, followed by the lack of monitoring of students' learning with 27.1%, and the lack of technical or pedagogical capacity of parents or tutors to transmit knowledge with 23.9%.

In higher education, there are delays in the publication of official statistics for the 2020-2021 and 2021-2022 school cycles (the latter is about to end).

The delay in the availability of these figures is worrying, as they are necessary to calculate failure and/or dropout rates from the beginning of the emerging virtual education, another manifestation of the difficulties of communication between students, schools and authorities during the pandemic.

A document issued by Unesco (UNESCO.IESALC, 2020), in addition to providing relevant data such as the number of computers and connectivity in schools and homes, attempts to provide a generalised overview of some questions about the impact of the pandemic on higher education; however, it is limited to giving recommendations regarding the avoidance of health risks and proposes a temporary closure, a rather questionable recess of activities in this sector. Aguilar Gordon (Gordón, 2020) considers that it was precisely this forced social isolation that motivated this emergent accommodation, which gave rise to distance education, mentioning its importance, in addition, within the disadvantages of virtual education to the factor of social inequality and the challenges when facing online education, referring to a series of political, economic, psychosocial, educational and cultural difficulties developed at all levels of education, suggesting that the successful use of technological resources could generate quality education.

Today, in higher education, the return to face-to-face classes is a fact, and mention is made of a possible return in a so-called "hybrid" or "mixed" modality, with distance education also being offered in some degree courses, and as in primary, middle and high school education, the return to face-to-face classes, without an objective assessment having been made of the advantages and disadvantages that this stage of virtual education represented; and the academic situation, the competences that show good academic achievement (Torres *et al*., 2021) and the possible causes of current dropout and failure. The results of research on these aspects could be contrasted with the international findings on virtual and face-to-face education. This article gives an overview of the research idea in its introduction, followed by the methodology, which is extensively explained, the results, which are discussed, and the conclusions regarding the results obtained.

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Methodology

In order to find out the positive or negative aspects of face-to-face and distance education during the COVID 19 pandemic and which could be a factor favouring or determining student dropout or failure, the 45-question survey (Cronbach's alpha 0.85; sample adequacy index KMO 0.884) previously validated by Ortiz-Sánchez (Ortiz-Sánchez *et al*., 2021); 174 students were selected from a population of 306 TecNM students by stratified random sampling, who voluntarily, objectively and honestly answered the survey.

Students from different degrees and semesters participated: Computer Systems Engineering (ITMérida) were students in 4th, 7th and 8th semesters; Biochemical Engineering, Basic Sciences and Electrical Engineering (ITTuxtla-Gutiérrez) in 3rd, 4th and 9th semesters, there was a case of students who asked to be allowed to answer the survey, making a total of 192 surveys conducted, the percentage of IBQ students represent 27. 77 % and those of ISC are 33% CB and IE 39.21% approximately, being all of them the subject of the present investigation.

The survey was provided to them through a mobile application developed in this research for this purpose. In the survey, 4 aspects were considered for evaluation: 1) Attitudes during the Covid19 pandemic, 2) ICT applications in education, 3) Problems when studying online during the pandemic and 4) Exploration of face-to-face education. An ordinal Likert-type rating scale of 1 to 5 was chosen, with 1 being the minimum and 5 the maximum. The score indicates the student's opinion on each of the questions, ranging from strongly disagree to strongly agree. The statistical programme SPSS v23 was used to analyse the results.

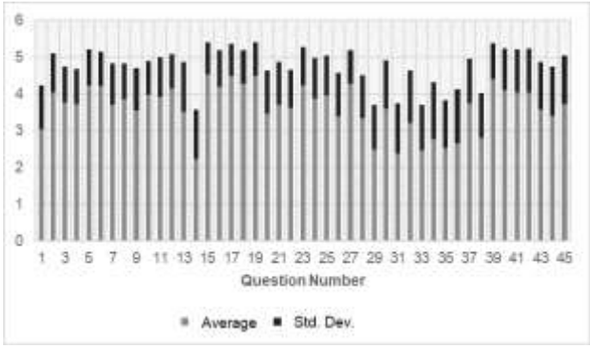
Results

The change from face-to-face to online education occurred unexpectedly. Neither the teachers nor the students were prepared for this challenge, adapting the means and techniques to the time available, so they adapted on the fly using the materials and knowledge they both had.

With the main idea of getting to know the ideas expressed by the students, one of the actors of education, the application of this objective test was carried out, finding a variety of answers and ideas, with results that present a vision from within the training process itself, some coincide, others do not, with what was found in different national and international reports; they can indicate in the context in which this research was developed, what was the student's perception of online education during the pandemic, compared to previous face-to-face education.

The survey applied has the characteristic that the same questioning is carried out, but in online education (odd questions) and face-to-face education (even questions), also grouped into 4 sectors of interest for this research: Attitudes (questions 1 to 14), Use of tics (questions 15 to 28), Problems when studying during the pandemic (questions 29 to 38) and exploration of face-to-face education (questions 39 to 45).

The responses of 192 surveys were evaluated, and in order to analyse the trend of the data obtained, graphs were made of the odd and even questions, and graph 1 shows the averages of the odd responses:



Graph 1 Averages of responses to the odd-numbered questions in the validated survey
Own Elaboration

The graph shows the average results of the answers given, in the bars that represent the attitudes towards the pandemic (1 to 13), it can be seen that the highest acceptance was for question 5, to question 1 the answer applies to the option neither agree nor disagree, marking a neutral tendency towards online education.

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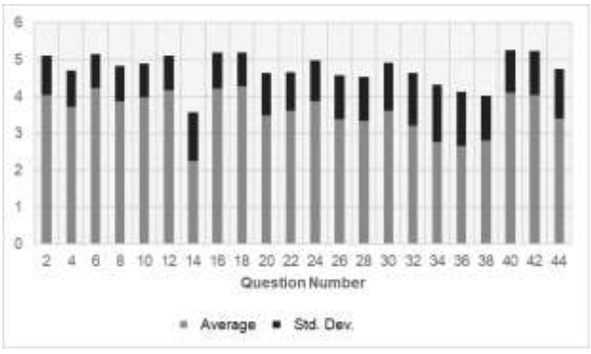
In the Use of ICT in education (15 to 27), the highest acceptance is found towards "totally agree", i.e. they accept the use of basic programmes, information search engines, e-mail, virtual libraries, Facebook-type networks and virtual platforms. In terms of problems when studying online (29 to 37), the bars clearly show a tendency to "disagree", indicating that there is little problem to have internet at home, they can have a PC, use of microphones without problem, work does not represent a problem to study online, in question 37 they accept, giving the highest score for "agree" that the use and abuse of social networks have been one of the main distractions for learning, finally, in exploration of face-to-face education, the highest score was in "agree" for the acceptance that face-to-face education has a fundamental role in learning, the other answers are in values close to "agree", which represents a higher acceptance for face-to-face education compared to online education, they feel little satisfied by the online education they are receiving and that online education limits learning situations.

Graph 2 shows the average data for the paired questions, all of which are similar to the previous graph, except that the questions related to face-to-face education are referenced here.



Graph 2 Averages of the answers to the paired questions of the validated survey
Own elaboration

Although the questions were worded the same, the focus given in these questions was to question face-to-face education, it was found in attitudes (from 2 to 14) that most of the answers were closer to an average value for the answer "agree", in this case, students accept face-to-face education fostering their interest in teaching and learning processes, the use of Tics by teachers in face-to-face education, and its improvement, which could be interpreted as a manifestation of interest in face-to-face teaching.

From this group the only answer close to 2 ("disagree"), is further underlining that face-to-face education enables them to learn properly; in Use of ICT in education, the 2 questions with the highest score and close to "agree", show that in face-to-face education are also used basic software and information search engines, virtual libraries, different means of virtual communication such as e-mails, forums, etc., and virtual platforms such as Moodle and Moodle and virtual platforms such as Moodle and Classroom. When looking at the answers given to the group of Problems when studying online (30 to 38), the students answered somewhat differently to the same questions but referring to online education, their first answers (30 and 32) are quite close to the value of 4 (agree) emphasising that there are problems due to the failure of the internet,

The last question in this group (question 34 and 36), their answers are close to an average score of "neither agree nor disagree", indicating that there are no problems with the use of a PC at home, nor with internet failures due to the locality where they live, the last question in this group (question 38) had an answer tending to a value of 3 on the Likert scale, unlike the answer given in the online education situation (close to "disagree"), remembering that this is the question that asks the student to answer "whether the use and abuse of social networks is a detriment to education", the answer given in the case of the directionality to online education varied with respect to the answers given in the face-to-face education approach, in fact there is significant statistical difference, and suggests that when the student is in face-to-face classes, he/she does not spend much of his/her time in social interactions, through social networks.

In the last group exploring face-to-face education, all 3 questions were answered with values close to 4, referring to a greater acceptance of face-to-face education, and a slight tendency towards a degree of discomfort with online learning in a home environment.

The following table shows the average results analysed, grouped into the items of analysis and also included the median, as a measure of central tendency, which optionally allows for an easier interpretation of results.

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Survey question	Media	Standard deviation	Median
1	3.047	0.0857	3
2	4.067	0.0745	4
3	3.771	0.0704	4
4	3.724	0.0701	4
5	4.240	0.0710	5
6	4.224	0.0672	4
7	3.708	0.0818	4
8	3.859	0.0703	4
9	3.547	0.0838	4
10	3.974	0.0602	4
11	3.922	0.0788	4
12	4.161	0.0677	4
13	3.521	0.0982	4
14	2.245	0.0956	2
15	4.526	0.0644	5
16	4.203	0.0710	4
17	4.495	0.0622	5
18	4.276	0.0654	5
19	4.500	0.0652	5
20	3.479	0.0839	4
21	3.703	0.0852	4
22	3.609	0.0763	4
23	4.240	0.0751	5
24	3.875	0.0804	4
25	3.953	0.0786	4
26	3.391	0.0854	3
27	4.286	0.0663	5
28	3.344	0.0854	3
29	2.490	0.0877	3
30	3.604	0.0946	4
31	2.391	0.0985	2
32	3.219	0.1022	3
33	2.464	0.0895	2
34	2.771	0.1122	3
35	2.542	0.0934	2
36	2.661	0.1056	2
37	3.745	0.0878	4
38	2.807	0.0874	3
39	4.406	0.0709	5
40	4.104	0.0826	5
41	4.047	0.0846	5
42	4.042	0.0864	5
43	3.568	0.0950	4
44	3.406	0.0972	3
45	3.719	0.0961	4

Table 1 Descriptive data of the variables. Attitudes (1-14, blue shading), Use of ICTs in education (15-28, orange shading), Problems in online education (29-38, green shading) and Exploration of face-to-face education (39-45, no shading) were grouped together education (39 to 45, no shading)
Own Elaboration

Both graphs 1 and 2 and table 1 show that there is no particular trend in the averages of the answers, the answer with the highest score (mean=4.526), with an approach to "strongly agree" was question 15: "In online education I frequently use basic programmes" and the same question applied to face-to-face education also had the lowest score (mean=2.245), "disagree" and both in the sense that they were applied are corresponding, the answers are congruent in the sense of online and face-to-face education.

Analysis of variance was also applied to find out whether or not there are statistically significant differences between the answers given to each pair of corresponding questions, i.e. questions 1 and 2, 3 and 4, 5 and 6 were compared and so each pair relating the same idea, to perform this analysis of variance it was necessary to determine the condition of normality, applying the Kolgomorov Smirnof test, the non-existence of normality between the answers given by the students was demonstrated.

Given the lack of normality in the answers to each of the questions, corroborated by the aforementioned test, the analysis of variance was applied by means of Spearman's coefficient, which showed that there is a significant difference between questions 1 and 2 and between 13 and 14; in all the other questions there was no significant difference. The interpretation for the lack of correlation between questions 1 and 2 and between 13 and 14 may be due to the fact that the student has had difficulties in defining a tendency of acceptance regarding online and face-to-face education, the answers being very varied, showing a certain degree of confusion and non-conformity and it is not clear in their position as students that they have achieved the required learning; it could also be interpreted as the factor that increased the drop-out rate and not the failure rate that occurred in most of the HEIs.

It is notable that, in the face of the crisis caused by the pandemic, students seem to be more aware of their strengths, of their potential to learn and achieve the competences, initially each one adapted the virtual platform they knew or had access to, with the resources they had at hand, and this is precisely what is highlighted in the results of this survey, the ability to adapt, and in the face of the return to face-to-face classes, they are certainly rethinking this interesting expectation of greater interaction and teacher-student communication, For this reason, education today must take a responsible, appropriate, tolerant approach, but without ceasing to be objective, certain, that allows better parameters to be established for measuring the competences achieved, placing more emphasis on seeking better forms of evaluation for an emerging education, which demonstrates to students and society that studying online is as objective and valid as face-to-face education.

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Funding

This research was funded by the authors' own resources.

Conclusions

The results of this preliminary research show that the adaptation of each stakeholder in the educational process, be it teacher, student or student, according to their own interests, has nuanced the learning required in higher education, which, unlike other levels of education, is subject to a particular type of labour, economic and social demands.

These particularities caused technological and pedagogical challenges in the process of implementing and operating online education, especially in groups of students whose reference point is face-to-face education.

It can be observed that the fundamental element of the online educational process, communication, was hindered by different situations, one of them being the economic aspect, as the student lacks the monetary resources to implement a communication model that is effective to the institutional requirements and that the group's teacher demands.

On the other hand, socially, the student's feeling of isolation at home and his absence on the school campus, where personal interaction with his generational peers takes place, had an impact on performance.

As for the aspect of effectiveness in the use of time, it is evident from the responses that it was made more efficient, as the time spent travelling from home to school was drastically reduced, or at best not used at all.

However, it was not used in the number of hours devoted to study, but perhaps not in leisure time or the intensive use of social networks.

Regarding the academic situation, some consider that it was positive to learning, however, a significant part estimated that learning was not as expected, mainly explained by the pedagogical character that occurs in the dynamic interaction between peers, and that develop the group learning process, but due to the nature of online education can not be established.

In some cases, these factors have led to student desertion, especially in groups of students who, because of their economic and social status, belong to certain urban, semi-urban and out-of-town groups, and who, in order to meet their basic needs for economic survival, put aside their interest in education and a long-term professional career, concentrating instead on activities that involve the here and now.

As a consequence of these factors, there is an indistinct appreciation among students of the benefits of distance education compared to face-to-face education, although for teachers this feeling is not accurate, as they state that there are deficiencies in the academic training of students during the pandemic.

As a future research, it would be worthwhile to emphasise the different appreciations that teachers and students of diametrically opposed specialisations may have had, given that some of these specialisations, due to their own structure, may be more easily adapted to online education than others.

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Formative assessment for virtual education in professional studies

Evaluación formativa para educación virtual en estudios profesionales

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Abstract

The Bachelor of Graphic Design (BGD) of a University in the State of Mexico, presented difficulties in the system of evaluation, notwithstanding applying evaluation only through qualifications, without considering the *formative evaluation system*. Therefore, this study is focused on incorporate *formative assessment* into the subjects of the BGD curriculum through the model of Dick y Carey (2015); the objective generated instructional alternatives to strengthen the teaching-learning process of the subjects in virtual modality. For that reason, each of the elements of the model is presented, which is made up of phases, evaluators, dates, objectives, and instruments, as well as the conclusions of the research.

Formative Assessment, Virtual Education, Instructional, Strategic Planning, Higher EducationSuperior

Resumen

En la Licenciatura en Diseño Gráfico (LDG) de una Universidad en el Estado de México se detectó que presentaba dificultades en la didáctica de evaluación, además de aplicar la evaluación solamente mediante calificaciones, sin considerar la evaluación formativa. Por consiguiente, este estudio tiene como propósito incorporar la *evaluación formativa* en las asignaturas del plan de estudios de la LDG mediante el modelo de Dick y Carey (2015); con el objetivo de generar alternativas instruccionales para fortalecer el proceso de la enseñanza-aprendizaje de las asignaturas en modalidad virtual. Por tanto, se presentan cada uno de los elementos del modelo que se compone de fases, evaluadores, fechas, objetivos e instrumentos, así como las conclusiones de la investigación.

Evaluación Formativa, Educación Virtual, Instruccional, Planeación Estratégica, Educación

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1. Introduction

With the integration of information and communication technologies (ICT) in the field of education, the teaching-learning process has been developing through different environments and situations; hence the challenge lies in recognising the need to analyse what learning in virtual environments implies and how they affect the appropriation and application of the curricular contents of a particular course, as well as the interactions between teacher-student, student-student and student-content. Likewise, to ensure that the application of ICTs is oriented towards the design of diverse learning resources that make it possible to transcend the barriers of time and space, promoting the creation of learning networks, through which the resources designed are shared in order to adapt them to the characteristics and situations required by each student.

In this sense, Miklos and Arroyo (2008) point out that in the digital era, the most successful use of ICT in virtual education projects are those that are born from an academic network that gives them support and viability. Therefore, the challenge focuses on achieving collaborative and cooperative work, which would enable the configuration of networks that strategically define the roles of each actor/institution, and value the contributions of its members in different dimensions: academic, administrative and technological. Consequently, evaluation processes are also affected considering that they must transcend towards the application of ICTs as means or tools that facilitate evaluation. Hence, to achieve the purpose of the study, each of the elements of the Dick and Carey (2015) model was developed, which is composed of phases, evaluators, dates, objectives and instruments. Finally, a number of conclusions are drawn.

1.1. Background

The process of improving higher education is based on the need to train a professional who has a comprehensive training to respond to the demands of society through a solid theoretical and practical training. When developing a diagnosis with teachers who are part of the academic staff of the Bachelor's Degree in Graphic Design at a university in the State of Mexico, it was detected that there were difficulties in the didactics of evaluation.

In addition to applying evaluation only through grades, without considering formative evaluation (Granizo, et. al., 2022; Viadero & Vega, 2022).

Formative assessment emerges as an indispensable element of the methodological process of the Dick and Carey (2015) model. Therefore, the purpose of this study is to incorporate formative assessment into the subjects of the LDG curriculum through the Dick and Carey model; with the aim of generating instructional alternatives to strengthen the teaching-learning process of the subjects. Based on the above, the learning unit of strategic planning (PE) in its virtual modality was taken as a case study, where the purpose of the lesson was that the 9th semester LDG students will apply the strategic planning model of Kotter (2004) to develop the mission, vision and objectives of a specific project.

In that context, it is noted that this formative evaluation report required an expert(s) and one-to-one review of each of the course components. In general, it was necessary to check the functioning of the use of the Canvas platform to work virtually. In particular, instructions, objectives, presentation, examples, grouping, media, participation, practice, feedback, evaluation, rubrics, follow-up activities, results and discussion were reviewed. These components belong to the sections of the platform: syllabus, weekly modules, assignments, audiovisual materials, forums and blogs. All with the indispensable elements of the course that at the time were reviewed by the aforementioned subjects.

1.2. Purpose

The formative evaluation report of the e-learning course aims to provide an overview of the content, process and outcomes of the instructional project. It aims to review the performance of the components that made up the lesson using the content analysis technique. In that sense, specialists and students, either one-on-one or in groups, were required to provide information through an instrument that was applied. This data was translated into results that were analysed and contributed to the continuous improvement of this project.

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1.3 Formative Evaluation

In Cuba, Pasek *et al*. (2017) developed a study focused on formative assessment in the teaching-learning process, with the aim of reflecting on how to apply it appropriately in the teaching-learning process. These authors define formative assessment as a process by which teachers identify their students' mistakes, understand their causes, as well as make decisions to overcome them, and develop improvements in the students' learning process. Also, the research exposes the coincidence of various studies on the need to study the construct of formative assessment from a theoretical, conceptual and methodological framework, its subordination to needs, as well as the demands of its impact on the pedagogical process, its effects and consequences.

Moreno *et al*. (2019) developed a study in Mexico focused on formative assessment as a feedback activity for educational psychology students. The findings resulted from supervised practice through formative assessment, where the subjects who were part of the study who observed and participated in the assessment have the opportunity to improve their professional performance through discursive interaction as part of the process. Consequently, the importance of this type of analysis for the study of the evaluation of supervised practice and its formative value in real situations was recognised.

Joya (2020) developed research in Lima, Peru, focused on formative evaluation as an effective practice in teacher performance. In it, the author mentions that formative assessment as part of the pedagogical process fulfils a function that facilitates the teaching-learning process of students. In this sense, the findings showed that teachers value and promote formative assessment in their classes, derived from the fact that students' competences are improved and strengthened through permanent and systematic assessment.

1.4. Virtual Education

In a study Crisol *et al*. (2020) state that virtual education (VE) focuses on "an evolution of distance education and a transformation for face-to-face and blended learning, as it allows the acquisition of knowledge through the incorporation of technological means, thus facilitating lifelong learning" (p. 15).

While Rizo (2020) states that VE "is one more option for permanent updating that responds to the needs of each person, thus offering different alternatives or solutions to a series of situations that conventional schooling cannot address" (p. 30). Therefore, it is highlighted that EV as well as linking the use and application of ICT in the teaching-learning process, a flexible collaborative work is developed that makes use of ICT, making possible the implementation of new teaching-learning processes.

In Colombia, on the one hand, Yong *et al*. (2017) developed a study that focused on virtual education at higher education level, including the challenges faced by HEIs due to the increase of e-learning programmes. The results show the importance, as well as the need to develop programmes aimed at training in Virtual Education Management, as well as the area that coordinates its development, implementation and evaluation. On the other hand, Torres (2020) focused on the state of virtual education through the use of ICT. The results show a pilot project for the evaluation of education through digital platforms. It also shows that the institution has a virtual education department, where a virtualisation model of the subject Formulation and Evaluation of Investment Projects was developed for replication in other institutions or educational programmes.

León (2022), developed research in Ecuador on empathy in virtual education and meaningful learning, where a remote educational model was adopted to guarantee educational continuity, emphasising that empathy between the student and the teacher is of the utmost importance for quality education. This study developed a VE proposal focused on the search for meaningful learning. The results showed that empathy between the actors involved must be considered as part of the teaching-learning process in order to achieve meaningful learning, and consequently, educational quality.

Based on the above, the following three questions are posed: Should formative assessment be incorporated into the subjects of academic programmes? Does formative assessment contribute to the strengthening of teaching-learning processes? What are the advantages of carrying out formative assessment for the development of meaningful learning?

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Therefore, each of the elements of the model is presented, which consists of phases, evaluators, dates, objectives and instruments, as well as the conclusions of the study.

2. Research Method

A formative evaluation report is part of a methodology proposed by Dick and Carey (2015) in relation to the design of an instructional project. This report was supported by several elements for the continuous improvement of an educational proposal. The elements are composed of phases, evaluators, dates, objectives and instruments. In this particular case, the phases consisted of an expert who was chosen because of his track record in developing strategic plans for more than 15 years, and who is familiar with the target population.

In addition, four students participated, who will be part of a virtual course on strategic planning and in this case, helped with the completion of an instrument to learn about their perception of the subject (Ballesteros, 2007). This report describes the results of the application of the instruments to these subjects, where evaluators, dates of application of the instruments and, at the same time, the components of the lesson were identified. In particular, the most important part was to review the operability of the entire course. Implications arise from the evaluators' observations and at the same time, in each of the components following Dick and Carey's (2015) instructional review process.

2.1. Technique: Expert Review

Description of the Expert

The expert selected, with expertise in strategic planning, implementation, re-engineering and change management for results. Also in senior management at business and government level and familiar with the target population. He is characterised by his high performance, always oriented to the achievement of objectives considering the importance of work teams and senior management. As well as in the development of plans and strategies not only educational but also commercial for different business units (Aramayo, n/d; Rivera & Higuera, 2021).

Instruments

The purpose of the instrument used with the expert (SME) was to make an effective content review of the instructional design of the strategic planning e-learning course. This required the collation of a checklist of the following instructional components: pre-instructional activities, presentation of information, learner participation, assessment and retention/transfer activities; estimating learning type, content, clarity and motivation.

Procedure

The activities are described below in the order specified as part of the data collection process, all of which were necessary to carry out the formative evaluation by the subject matter expert of the virtual PE course:

1. The SME was contacted via email. A letter of invitation was sent to participate in the formative evaluation of the strategic planning course. The purpose of the evaluation was highlighted.

2. The EMS was asked to confirm their participation by the same means.

3. Once the participation of the EMS was confirmed, all the features of the virtual SP course were explained in detail. It was emphasised that a set of instructional materials had been designed, and that their participation was technically required to assess the relevance of the contents.

4. Subsequently, the SME was informed to access the Canvas platform where the PE course was located (link provided), was asked to review the relevance of the course components under his own method. In general, he checked the functioning of the use of the Canvas platform to work virtually. In particular, he reviewed: instructions, objectives, presentation, examples, grouping, media, participation, practice, feedback, assessment, rubrics and follow-up activities. These components belong to the following sections of the platform: syllabus, weekly modules, assignments, audiovisual materials, forums and blogs. All with the indispensable instructional materials of the course.

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5. The SME was then instructed that once the review had been carried out on the Canvas platform, he should proceed to respond to the evaluation instrument that was sent to him. It was requested to return it within five days of receipt.
6. Upon receipt of the instrument with the corresponding responses, the SME was thanked for its time and contributions; it was mentioned if it was of interest to collaborate with a subsequent revision of the course.
7. With the instrument completed, the data were processed.
8. The responses to the components of the questionnaire were categorised, coded and classified.
9. The data were analysed using the corresponding technique and the following report was issued.

2.2. Technique: One-on-One

Subject

For the individual formative evaluation of the virtual course of strategic planning, four students of the 9th semester of the LDG were contacted, regardless of age or gender: (a) two students with the highest academic performance, considering their objectivity, criticism and academic commitment; (b) two students who were below the average academic performance, considering their objectivity and criticism. These students would then take the subject during the autumn 2022 school year.

Instruments

In order to fulfil the purpose of the formative evaluation, data collection was achieved through the application of an individual instrument (subjects of the study). It was an online questionnaire (google survey), which aimed to identify the difficulties that the student would detect with respect to the structure of the course. The instrument consisted of 20 questions, which examined pre-instructional activities, presentation of information, student participation, evaluation and retention or transfer activities; the criteria of clarity, impact and feasibility of the information were considered.

For clarity of instruction

There were three categories of information: messages, links and procedures. The first category, message, referred to the clarity of the message for the learner, determined by vocabulary, sentence complexity, and message structure. Regardless of whether the learner read, heard or saw the message, he or she would be able to follow it. The second category, links, referred to how the message was designed for the learner, including contexts, examples, analogies and demonstrations. The third, procedures, referred to the characteristics of the instruction, such as the sequence, the size of the unit presented, the transition between units, the pace, and the variation built into the presentation. The clarity of instruction would change when any of these elements had been appropriate for the students. Instruction would be so slow and interactive that the learner would lose interest, or proceed so quickly that comprehension would become difficult (Gangé, 1975).

The second criterion, learner impact

It referred to the learner's attitudes about the instruction and his or her achievement of the specific objectives. That is, relevance to him or her; achievable with reasonable effort and whether the experience was interesting and satisfying.

The third criterion, feasibility

It included the learner's ability, the medium of instruction and environmental instruction. Also, the rating scale in the instrument was based on specifically qualitative assessments. In any case, the evaluations were assigned numerical factors, using a Likert scale. That is, a scale of one to five, where 1 meant bad and 5 meant excellent. Thus, the data collection from the instrument and the respective value scales allowed the purpose of the evaluation to be fulfilled.

Procedure

The activities are described below in the order specified as part of the procedure for collecting the data needed for this report:

1. Permission was sought from the Head of School of the LDG academic programme to conduct the study.

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2. The application and the documents required to carry out the study were submitted to the Institutional Review Board (IRB) of the institution.
3. The instrument was applied to the subjects of the study (selected students), respecting the criteria that were framed in the structure of the virtual PE course, as well as the respective value scale.
4. Authorisation was requested from the School Management of the LDG academic programme for the application of the instrument.
5. For the application of the instrument to the subjects of the study, the Director of the School of the AP was asked for the name of four 9th semester students, two with the highest academic performance, and the other two, who were below the average performance, including their email, in order to send a letter of invitation to participate voluntarily, under all the caveats in this study and the respective anonymity.
6. A letter of invitation to participate in the study was sent to the students via email.
7. It was explained to the students that a new set of instructional materials was designed for the online strategic planning course and that their participation was required to assess their perception of it.
8. The students were informed to access the Canvas platform where the SP course was located (link provided) and asked to check the relevance of the course components under the corresponding techniques. In general, they checked the functioning of the use of the Canvas platform to work virtually. In particular, they reviewed: instructions, objectives, presentation, examples, grouping, media, participation, practice, feedback, evaluation, rubrics and follow-up activities. These components belong to the following sections of the platform: syllabus, weekly modules, assignments, audiovisual materials, forums and blogs. All with the indispensable instructional materials of the course they reviewed.
9. The students were instructed to access the link that was sent to them, which would redirect them to the questionnaire that they would answer, being as objective, critical and reflective as possible in their answers.
10. The instrument included the value scales as established in the Likert scale, which measured individual attitudes or predispositions with respect to specific concepts, through coded and selected items, as in this case (Kerlinger, Lee & Bhanthumnavin, 2002).
11. The questionnaire was completed and returned to the instructional designers within five days of receipt; their e-mail addresses were included in the instrument for clarification.
12. As soon as the questionnaires were completed by the study subjects, the data collected were processed.
13. The responses to all the constructs in the questionnaires were categorised, coded and classified.
14. The value scale defined in the instrument was considered and the data analysis proceeded to generate the following report.

3. Results

In order to present the findings, it is necessary to emphasise that the purpose of the study focused on incorporating formative assessment into the subjects of the LDG curriculum using the Dick and Carey (2015) model; with the aim of generating instructional alternatives that will strengthen the teaching-learning process of the subjects in the virtual modality. This section presents the results obtained from the evaluation of the instructional proposal related to the content, process and evaluation of the PE course. The performance of the components that made up the lesson was reviewed using the analysis technique under the Dick and Carey (2015) scheme. In that sense, specialists and students, either one-on-one or in groups, were required through an instrument that was applied to provide information to understand the implications of the responses.

It should be noted that through this analysis technique, qualitative results were obtained that allow us not only to sustain the project, but also to be in a position to make continuous improvements. Meanwhile, it should be noted that the sample population was represented by an expert in strategic planning and four students (one-to-one technique) from the 9th semester of the Bachelor's Degree in Graphic Design at a university in the State of Mexico. It should be noted that the subjects actively participated in the study.

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This intervention allowed us to observe the behaviour of the instructional materials with respect to the virtual strategic planning course. Consequently, the performance of the lesson components by the expert and the students was reviewed. The data was then analysed, classified, categorised and coded.

In general, the information came from two sources: (a) the formative evaluation protocol - expert (SME) which established a characterisation of the main components of the materials, type of learning, content, clarity and motivation; (b) the formative evaluation protocol - individual, which included 20 questions related to the main components of the materials, which were measured using the Likert scale. The analysis of the results allowed us to establish a contextual, in situ picture to understand the perception of the instructional design of the virtual strategic planning course.

3.1. Experts

For this case, as indicated, the expert based on her expertise elaborated an analysis of the components of the materials, contemplating the variables of learning, content, clarity and motivation of the course in two aspects, the context of learning and the context of performance. The latter, according to the instructor, was observed directly in correlation with the content, which is intended to operate the constructs during practice.

Summarised in the learning context, during the application of the instrument, the expert considered that the pre-instruction in relation to the topic of strategic planning was clear and obeyed a pattern of described orientations for the development of instructional activities. Consequently, on motivation, she found that there was a direct correlation between the constructivist pedagogical model and strategic planning as an object of study. He argued that there is evidence that it is the learner who, through the instructions, will have to construct his or her knowledge with the support of the subject components. He also considered that the general and specific objectives were perceived as clear, precise and congruent in relation to the design plan. Thus, the input skills and abilities were clearly exposed to certain verbal and communication orientations with the learners which would lead to learning (Mintzburg & Quinn, 1993).

In terms of presentation, the expert did not make any observations regarding sequence and size; she only suggested that the examples should be congruent with what was being presented. However, she considered that the content framed elements indispensable for the learning of the basic constructs of strategic planning to be directly related to the performance context. He argued that considering the definition of the components of planning was a first step in subsequently seeking to understand the characteristics and its component elements. This process showed that the foundations were laid for building the mission, vision and objectives of a place.

In other words, he explained that not only were the elements intended to be defined, characterised and exemplified, but it was also possible to observe that there were activities that led to measuring performance in the context of a site. Doing practicals, exercises or solving case studies showed that work was not only at an elementary level, but on the contrary, it was perceived that in each of the weekly activities of the instructional project, students were motivated to solve the cases in their workplace. This showed that there was a direct interrelationship between theory and practice. Both aspects involved observing each other in detail under the performance of the units and exercises, following up or monitoring, being relevant in order not to break this pattern of activities that would lead to achieving the goals.

On participation, he argued that practices needed to be reconfigured because the materials did not contribute to the objective of learning achievement. He pointed out that definitions needed to be operationalised to strengthen the understanding of the EP; he also mentioned that it would be necessary to look for new materials, readings or videos, which would delineate the meaning of the participations. He also commented that it was essential to develop more case studies together as requested in this course.

As a result, the feedback activities were not entirely clear. He therefore requested that the trainers or facilitators could develop some activities to enrich this area of opportunity. Meanwhile, the evaluation, particularly in the pre-test, considered that the application in the diagnostic phases, showed indispensable exercises to establish an overview of the knowledge that students would build during the course of their studies.

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He reiterated that the instrument was adequate and ideal, however, he suggested determining a new time period. With regard to follow-up activities, he noted that there was a need to instruct a summary to be produced to confirm retention and transfer.

3.2. Students

The four students who were selected were males and females aged 19-23 years old from the 9th semester of the LDG, two with the best averages of the generation and the other two with the average below average. The result of the application of both instruments, according to the 20 questions applied, determined that the input skills showed that the students were able to apply not only verbal skills but also conceptual, procedural and attitudinal skills, as presented in questions 12 to 15, which were related to these skills.

Therefore, according to the data, the students were motivated with a high degree of pragmatism. The results between the objectives and the total of the questions applied showed that they had analytical-thinking skills identified in answers 7 to 12, which allowed them to receive the proposal with enthusiasm, according to the data. In addition, according to the students, they could develop instrumental and interpersonal and technological competences, according to answer 17.

The pretest (Pretest 1 PE), had the purpose of previously evaluating the students' knowledge on the topic of strategic planning. Therefore, according to the results, the comments in general were about the questions, they considered that they were simple, concrete and easy to answer. For this reason, they recommended that the time allocated to the application of the pre-test should be less than the time proposed.

Direct responses to the instruction. In this item, the students analysed the instructions and considered that there was no inconsistency, neither in the beginning, welcome, instructors, nor the syllabus. However, during the folder sequence of the weekly activities, they considered that the activities of week one could be incorporated into week two to generate a single week of activities.

Likewise, during weeks 2, 3, 4, 5, 6 they recommended that although the instructions were in line with the objectives, the suggested activities did not meet the objectives. On the one hand, they found it confusing to follow the instructions because there were so many sequential folders for each of the objectives, sub-themes and activities. On the other hand, the activities, videos, readings, exercises and diagrams did not fulfil the purpose of the established objectives. Therefore, they recommended that the materials be corrected and that each module be described on a single page of the Canvas. The instructions could be more precise and concrete.

Learning time. No observations were found in this section.

Means of communication, procedures and materials. The means of communication were adequate, and no observations were expressed; it was mentioned that forums and blogs were essential to enrich the information. Regarding the procedures, they considered that along with the materials, they expressed confusion, since the fact of having sequential folders in the weekly activities section confused the students about the purpose of the unit.

It should be clarified that the materials that were placed on the Canvas platform, readings, videos, examples and diagrams, were intended to encourage the subjects to review thoroughly and above all the quality of the information. The goal was to obtain reliable information that would help to provide more pertinent feedback for the model. It is known that Dick and Carey's instructional design establishes processes of continuous improvement, and given the models, it was urgent to determine which one would work best during practice, as was the case here.

3.3. Focused analysis

At this point in the formative evaluation of the virtual strategic planning course instruction, it was premature to make final decisions about changes to the materials for each of the units that make up the instruction. Changes should be made based on the overall effectiveness of the instruction. Therefore, the data collected were used to create an instructional revision analysis table (see Table 1).

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The table has four parts: The component being evaluated is listed in the left-hand column, the problems identified as well as possible changes are described in the next two columns, and the last column contains the evidence used to justify the change and its source. The resources considered to complete the table were: (1) the formative-expert evaluation (SME) protocol and (2) the formative-individual evaluation protocol. It should be noted that as the designers moved through the formative evaluation process, the changes that were made to the materials had different consequences than those intended.

Instruction Review Analysis Form				
	Main material components	Problem	The proposed change in the instruction	Evidence and Reference
1	Preinstruccional Pre-instructional			
	Initial motivation	None	None	Checklist elaborated by the expert (CEE) Students questionnaries
	Objectives	None	None	
	Skills of training	None	None	
2	Presentación			
	Sequence	Confusion to follow the instructions, due to the number of folders presented	Integrate all the contents of each module or unit, in a single Canvas page.	Students questionnaries
	Unit size	None	None	Checklist elaborated by the expert (CEE)
	Content	None	None	
	Examples	Lack of congruence between examples (readings, videos, and diagrams) proposed and the objectives set	Add more specific examples (readings, videos, and diagrams) that contribute complement to the achievement of the objectives.	Checklist elaborated by the expert (CEE) Students questionnaries
	Procedures	Confusion to follow the instructions and find the correct materials, due to the number of folders presented	Integrate all the contents of each module or unit, in a single Canvas page.	Students questionnaries
	Materials			
3	Participation			
	Practice	Lack of definitions	Include definitions in the practices that contribute to their understanding	Checklist elaborated by the expert (CEE)
		Complexity in the location of the folders with audiovisual materials, readings, diagrams, and examples.	Integrate all the audiovisual materials, readings, diagrams, and examples, of each module or unit in a single Canvas page.	Students questionnaries
		Confusion and complexity in the presented materials Difficulting the coherence and comprehension of the material with the requested activities	Add more specific materials (readings, videos, and diagrams) that contribute to the achievement of the objectives.	Students questionnaries
	Feedback	Lack of clarity in feedback activities	Specify feedback activities	Checklist elaborated by the expert (CEE)
4	Evaluation			
	Pretest	Too much time allocated to development	Decrease the time required to fill the product.	Checklist elaborated by the expert (CEE) Students questionnaries
	Postest	None	None	
5	Follow-up			
	Retention, transference, and context of action	The proposed activities will not achieve the impact in the context of action	Include the development of a summary or essay that allows the confirmation of the impact on the students context of action.	Checklist elaborated by the expert (CEE)

Table 1 Instruction Review Analysis
Source: Own Preparation

4. Discussion

According to the authors Dick and Carey (2015), the strategy of reviews reflects systematic thinking, as logic is applied in some processes linked to the problems identified in each of the components. This is why the following approaches are presented in an orderly manner and relevantly informed by observations made before, during and after the instructional project.

4.1. Design decisions

The design of this virtual strategic planning course arose directly from a performance problem that directly involved students of a bachelor's degree course at university level. In this sense, an instructional goal was proposed as an alternative solution, however, during the development of the instructional procedures it was found that despite being an administrative issue, there were problems in the instructional design.

Therefore, the recommended strategy should perfectly align the components to be designed. That is to say, to prepare the instructions perfectly based on the skills and abilities, to establish whether or not to do a pretest and post-test. Verify the attitudes to be developed, as well as the clarity and sequence of the instructions. The above depends on obtaining data that measures individual performance, which in turn can be compared with the actions and objectives set (David, 2003).

Instructional materials

It is recognised that in this area related to the media, although a mechanism was established to obtain truthful information and continuous improvement, the necessary care was not taken to incorporate audiovisual materials, readings, exercises and diagrams in accordance with the instructions and the general and specific objectives. So it has become clear that the Canvas platform has been restructured along with most of the components. It was incorporated in the way it was suggested by the experts and learners.

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4.3. Instructional procedures

The procedures that were established are based on the proposed methodology, so the recommendation has been that the objectives should be monitored closely to ensure that they are fully met. Throughout the process, it is necessary to monitor the behaviour of the instructions to avoid confusion on the part of the participants. It should be noted that during the reviews, there were no indications of misunderstanding, but rather it was recommended that the instructions be made more concrete.

4.4. Means of communication and delivery system

In this case, the means of communication used were those recommended in accordance with the instructional model adopted. The Canvas platform that was used generated the necessary means of communication to fulfil the instructions either in the forums or in the blogs. As is known, forums promote the formation of discussions on the topics as intended. Blogs have been created so that students have permanent access to the ideas of both individuals and groups and thus provide feedback on the topics.

Meanwhile, the course emails fulfil the commitment to maintain permanent communication between the instructors, the learners and the group itself.

4.4.1. Resources

According to the course design, it has not been essential to make any recommendations related to funds, staff, facilities or equipment; however, with regard to time, it has been proposed that it should be a course of no more than 5 weeks, with a duration of approximately 30 minutes per session as indicated in the input instructions. For this, there is no particular recommendation, but rather it is indicated that the time is adequate.

Finally, it is considered by technique that the final review of the materials should be effective in achieving the intended learning with the members of your target audience. If that is so, then you are in a position to be ready to reproduce, publish, or configure the instruction of this course for electronic distribution.

5. Conclusions

This study focused on incorporating formative assessment into the subjects of the LDG curriculum using Dick and Carey's (2015) model; to generate instructional alternatives to strengthen the teaching-learning process, particularly focused on the virtual course of the strategic planning subject. In this sense, it first becomes evident the need to develop a strategy focused on incorporating formative assessment into the learning units, where each of the components to be designed must be aligned. In such a way that the instructions are clearly specified based on skills and abilities. As well as considering the skills, abilities and attitudes to be developed and, not least, clarifying the sequence of instructions.

Secondly, it is confirmed that formative assessment contributes to the strengthening of virtual teaching-learning processes, considering that students' competences are improved by means of permanent assessments, as well as contributing to greater participation in class.

Thirdly, it is worth highlighting the advantages of applying formative assessment for the development of significant learning in virtual courses:

a) there is control of when and what is learned; b) a broad vision of the students' training, feedback on learning not achieved, verifying whether the student has the capacity to apply what they have learned; c) development of strategies for the improvement of teaching processes in the virtual modality.

Consequently, formative assessment facilitates the development of competences, the achievement of curricular standards, as well as the significant learning proposed. The limitations of the study were linked to the availability of the participants, as well as the estimated time needed to obtain the information. Finally, the formative evaluation report was developed and presented throughout the process as a guide for the development of the virtual course, with the purpose of improving the plan and the required results before its implementation.

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Has enough been done in plastics recycling?

¿Se ha hecho suficiente en el reciclaje de plásticos?

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Abstract

The need to segregate urban solid waste is a fact, something that has been achieved in a certain way thanks to the dissemination and awareness that has been promoted through environmental education, taught in educational institutions at all levels and the transmission of information through social networks. The follow work addresses the problem of the deficiencies present in the environmental management of plastic waste, due to the lack of classification and separation of the same. It is no longer just a matter of separating the urban waste produced, with the aim of reducing, reusing or recycling it, since, even in the best case scenario of correctly separating plastics from all other solid waste, reuse or Recycling is practically not possible if these are mixed together. This research hypothesizes that a large majority of people do not know how to distinguish the different types of plastic with which the products and containers that are used on a daily basis are manufactured. The objective of this research is to propose strategies to solve the problem raised based on the results obtained.

Types of plastic, recycling, Environmental Education

Resumen

Es un hecho la necesidad de segregar los residuos sólidos urbanos, algo que en cierta manera se ha logrado gracias a la difusión y sensibilización que se ha promovido a través de la educación ambiental, impartida en las instituciones educativas a todos los niveles y a la trasmisión de la información a través de las redes sociales. El siguiente trabajo aborda la problemática de las deficiencias presentes en la gestión ambiental de los desechos plásticos, debido a la falta de clasificación y separación de los mismos. Ya no se trata solo de separar los residuos urbanos producidos, con el objetivo de reducir, reutilizar o reciclarlos, ya que, aun en el mejor de los casos de que se lograra separar correctamente los plásticos de todos los demás residuos sólidos, la reutilización o reciclaje prácticamente no es posible, si estos se encuentran mezclados entre sí. En esta investigación se plantea la hipótesis de que una gran mayoría de personas no saben distinguir los distintos tipos de plástico con los cuales se fabrican los productos y envases que se utilizan de forma cotidiana. El objetivo de esta investigación, es proponer estrategias para resolver la problemática planteada con base en los resultados obtenidos.

Tipos de plástico, reciclaje, Educación Ambiental

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1. Introduction

Solid waste management is today a global problem and a challenge that affects human health, livelihoods, development and the environment.

There are a large number of researches in the literature that deal with the need for separation of the different urban solids that are produced in huge quantities all over the planet, this with the purpose of reducing, reusing or recycling them, and in this way diminishing the impact on nature that humanity is producing.

According to a report presented to the World Bank in 2018, called What a waste 2.0, 2010 million tons of municipal solid waste are generated annually in the world, and it is predicted that due to the accelerated advance of urbanization and rapid population growth, the amount of waste, will increase by 70% in the next 30 years (Kaza *et al*., 2018).

As for plastic waste that is polluting the oceans, constituting 90% of marine detritus, only in 2016, 242 million tons were generated in the world, the equivalent of a set of 1376 Empire State buildings (World Bank, 2018).

Although progress has been made in solid waste management, it does not show significant efficiency. "Countries are developing rapidly without having established adequate systems to manage the different composition of waste produced by citizens" (World Bank, 2018), and at the same time, it is the poorest and most vulnerable countries that are mostly affected.

Although, countries that show great progress in the percentage of waste that is recycled, still present significant proportions in incineration and landfill disposal of such waste, recognizing, that incineration is controlled and landfill disposal is performed in an adequate manner. In contrast to countries with less progress in the area of recycling, incineration is carried out incorrectly and even clandestinely, and other waste is disposed of in the open air, causing serious health and pollution problems.

An estimate published by Kaza *et al*. (2018), indicates that in low-income countries, more than 90% of waste is burned or deposited in the open air.

On the other hand, countries that are recognized with great progress in recycling, such as Germany, show high recycling rates that could be misinterpreted. The percentage data is taken from the volume of waste that arrives at the recycling plants, but not everything that arrives is recycled, since within the recycling process there is a new reclassification, where in the end, only a fraction of the incoming waste is recycled, the rest is incinerated (Revista Técnica de Medio Ambiente, 2022).

Certain German environmental organizations, such as Friends of the Earth, consider that less than 16% of recyclable waste, can be reused (Sensoneo, 2022). The problem lies in the mixing of different types of recyclable materials in items that arrive in the incoming load to the recyclers, whether it is packaging made up of different materials (cardboard, aluminum, plastic) or a mixture of different types of plastics. If these are not separated before entering the recyclers, it is very likely that they will be discarded and end up in incinerators.

It is essential to separate solid waste into the waste that is produced daily, but it is also important that when separating plastics, they are sorted for effective recycling, since they cannot be recycled if they are together.

In some places, the recycling companies are in charge of segregating the different plastics they receive, but in other cases, it is the users of the recyclers who must separate them.

Effective separation is not possible if we do not know how to identify the plastic material from which our packaging or product is made.

Most human beings have had contact with some type of plastic from an early age, but real knowledge of the different plastics can only be acquired through environmental education.

Unfortunately, many people do not have this opportunity, and even if they possess this knowledge, this does not certify that an individual assumes the commitment to participate in the solution of this problem.

As stated by Carrington *et al*. (2014) referred by Ramírez L. (2022), "positive environmental attitudes and intentions, unfortunately are not always and fully reflected in people's behavior".

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In the present work, the idea is raised that many of the people who use plastic containers or products in their daily lives, do not know the different types of plastic that exist, nor how to identify them correctly.

For this purpose, a short survey with very specific questions was prepared and applied to a sample of 236 individuals.

The results of the survey were then analyzed, showing, to a large extent, the confirmation of the hypothesis that was initially proposed.

The purpose of this work is to make known the importance of the segregation of plastic waste generated as urban solid waste, which can only be carried out through proactive environmental education, provided by educational institutions, government and civil associations interested in the environment.

To this end, a series of strategies are proposed, using, among other things, the wide diffusion of social networks.

2. Theoretical Framework

2.1 Recycling

The correct management of solid waste is a core issue that concerns all countries in the world.

According to the World Bank report (2018), "of the 2010 million tons of municipal solid waste, at least 33% is not managed without risk to the environment", and it is expected that by 2050, the volume of waste generated annually, will increase to 3400 million tons.

Some studies have been conducted for several years, to know the huge amount of plastics that end up in the seas and are harming birds, aquatic mammals and fish.

"The prediction that by mid-century the oceans will contain more plastic waste than fish" (Parker, 2018), has become a repeated phrase and a warning of the danger we are subjecting our planet to.

Even countries that have shown great progress in the subject of recycling such as South Korea, Germany and Sweden, have not managed to obtain a significant figure of recyclable waste that can be reused.

If we visualize some published data regarding the countries that manage their waste better and worse, as mentioned in the Technical Magazine of the Environment (2022), we find the "Global Waste Index" prepared by the association Sensoneo, in its 2022 edition.

For this study, Sensoneo took into account the waste management of the 38 member states of the OECD (Organization for Economic Cooperation and Development). The report was previously conducted in 2019, which allows for a comparative analysis with the data for 2022.

Among the factors taken into account for the ranking of the countries evaluated, as well as the calculation of the score obtained are the waste generated, recycling, energy recovery of waste, landfill, illegal waste management (open dumping) and other waste.

The country ranked number one in solid waste management is South Korea. Considering the most important factors, this country generated 400 kilograms of waste per capita per year, of which 243 kg were recycled, representing 60.8% recycling. In addition, there was a very low amount of landfilled waste (46 kg) and 0 kg deposited in the open air.

In contrast, the country that showed the worst management of its solid waste (of the 38 analyzed) was Turkey, with 424 kg per capita per year generated, only 47 kg recycled (11%), 347 kg dumped and the very surprising amount of 176 kg deposited in the open air.

Our country, with 359 kg per capita per year generated, 13 kg recycled (3.6%), 219 kg dumped and 89 kg deposited in the open air, was in an unfavorable 35th place.

The achievement of high recycling rates depends directly on the correct separation of the solid waste generated, but as mentioned, within the recycling process, there is a new reclassification of waste that decreases the actual rate of recycled materials.

This reclassification is generally carried out by the recycling companies, but it does not always happen that way. In our case, in the city of Chihuahua, the recycling companies only accept waste previously separated by the users of their services.

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The main recycling companies in the city of Chihuahua include: REMISA, dedicated to recycling ferrous and non-ferrous materials, Recilogic, which offers recycling services for different types of plastic, Copamex, which handles paper and cardboard recycling, Kalisch Recycling, provides scrap metal recycling, Tecnologías de Reciclado, accepts scrap and electronic devices, among others.

The information shown, referring to the recycling companies and their main processes, was obtained through a digital consultation of the pages corresponding to these companies and is shown in the bibliographic references.

2.2 Plastics

Why the concern about plastics?

"The mass production of plastics, which began only six decades ago, has accelerated at such a rapid rate that it has created 8.3 billion metric tons, most of which are disposable products that end up as waste" (Parker, 2018).

Plastics are very useful materials because of their durability, versatility, efficiency, hygiene and price. If treated correctly they can be reused, recycled or in the worst case, incinerated (producing an energy value), but if there is no good management of plastic waste, they end up polluting the soil, the sea and the air, becoming a serious danger to the health of living beings, the environment and its ecosystems, (Zschimmer and Schwarz, 2021).

The versatility of this material is so great that a large part of what surrounds us at home, work, school or public places is made of some type of plastic (food packaging, water bottles, cell phones, cars, bicycles, shoes, etc.).

If we are talking about objects of daily use such as the tires of cars or bicycles or the soles of shoes, it is required that they last in good condition for a long time, this is achieved with the use of plastics. In some cases we use plastics for a very short time, however their permanence in the environment when discarded can be very long, causing a serious pollution problem. Plastic bags, made of low-density polyethylene, take about 150 years to decompose completely. However, plastic bottles can take up to 1,000 years to degrade if they remain buried (Estrada R., 2020).

According to Plastics Europe (2020) cited by Gil C., (2020), plastic is a synthetic material that can be molded, that is, it is malleable, which allows it to be melted, pressed or extruded to obtain different shapes such as sheets, fibers, plates, tubes, bottles, boxes, etc.

The properties of plastics are very different, depending on the initial chemical compound (monomer) and the final product obtained, as well as the procedure followed for their manufacture, which is why they cannot be recycled as a whole, but must be separated for treatment.

Even so, some plastics are easier to recycle than others. For example, high-density polyethylene, which is used in beauty product packaging, as well as polyethylene terephthalate and polypropylenes, are plastics suitable for recycling, while low-density polyethylene (used for the manufacture of plastic bags) and polystyrene are very difficult to recover because they require a lot of energy in the process (García P., 2021).

Precisely the existence of the great diversity of plastic materials and the possibility of recycling them led to the creation of identification codes by the American Society of the Plastics Industry in 1988.

The classification uses a triangle formed by three continuous arrows, inside which a number from 1 to 7 is enclosed. On the outside of the triangle, the acronym identifying the type of polymer used in the manufacture is usually placed (Figure 1).

Figure 1 Symbology of low density polyethylene plastic
Source: SP Group

The following table shows the classification of the different plastics used, with their numerical codes and the name of the chemical compound from which they are formed.

Code	Abbreviation	Polymer Name	Uses
1	PETE o PET	Polyethylene terephthalate	Bottles for: non-alcoholic beverages, water, oil, etc.
2	PEAD o HDPE	High Density Polyethylene	Bottles for: Detergent, milk, grocery bags, etc.
3	PVC	Polyvinyl chloride	Pipes, outdoor ornaments, protective wall sheets, etc.
4	LDPE o PEBD	Low Density Polyethylene	Tablecloths, cream containers, bags for garbage cans, etc.
5	PP	Polypropylene	Caps for bottles, straws, cutlery, etc.
6	PS	Polystyrene	Cups, disposable plates, yogurt containers, etc.
7	Other o 0	Others	Teléfonos, artículos médicos, juguetes, etc.

Table 1 Classification of plastics
Source: (Gallegos C. et al., 2018)

As mentioned, in the city of Chihuahua, recycling companies require that the material to be subjected to the recycling process is already separated into the different types of plastic most commonly used.

On the other hand, there is no major problem when the users are companies or industries whose plastic waste is well identified and is of only one type or not very varied.

This does not happen in the case of waste from households, educational institutions or businesses, whose plastic waste does not come from any productive activity.

It is in this situation that there must be a knowledge of the plastic classification codes, so that the people who are going to carry out the separation of the different wastes, can do it in a correct way.

Due to the great diffusion that PET plastic has been given, because it has traditionally been used in the manufacture of soft drink and water bottles, most people relate it to beverages or food products and can identify it correctly.

But it is not only used in this type of packaging and additionally, there are other plastics also used in food products such as yogurt, which is packaged in containers made of HDPE.

Based on the hypothesis that the vast majority of people who do not have a formal environmental education do not know the plastic identification codes and therefore will not have the ability to separate them correctly, a survey was conducted and applied to a sample of 236 individuals.

3. Methodology

It was decided to conduct a study with a descriptive scope that was carried out with the participation of students enrolled in the different careers of the Instituto Tecnológico de Chihuahua II. The survey was elaborated using Microsoft Forms. Simple and direct research questions were formulated, taking care that they were not obvious or could lead to a bias in the answers. The questionnaire includes seven questions to determine whether the respondent is aware of the existence of different types of plastic and, above all, whether he/she has the ability to identify one from the other, among other equally important questions to support the research topic.

The sampling used was by convenience and the survey was applied to a group of 236 individuals of different ages and educational levels, with the collaboration of the students selected for this purpose.

Subsequently, the statistical analysis was carried out, which yielded interesting data and at the same time led to the elaboration of proposals that would help in the dissemination of knowledge of the different plastics and that would allow for their classification and subsequent separation.

4. Results

The questions contained in the questionnaire are shown below:

1. Schooling
2. Age
3. Is all plastic the same? Why?
4. Do you think there are different types of plastic?

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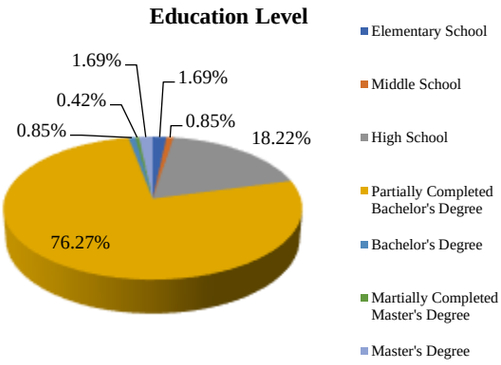
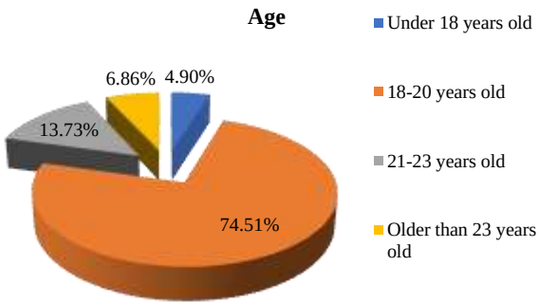
5. Which of the following types of plastic do you know?
6. Which plastics do you use the most?
7. How can you identify the type of plastic from which an object is made?

The answers obtained were the following.



Graph 1 Schooling
Source: Own Elaboration

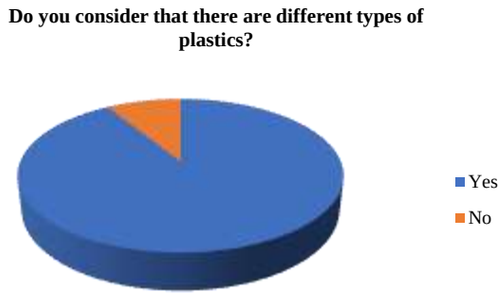
As can be seen in Graph 1, 76.27% of the individuals surveyed had a partially completed bachelor's degree; this is explained by the fact that the students who assisted in the application of the questionnaire selected their classmates as part of the sample.



Graph 2 Age
Source: Own Elaboration

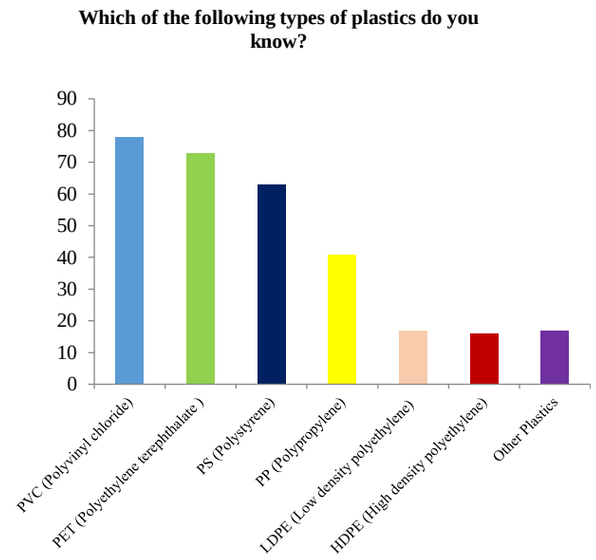
Graph 2 shows a high percentage (74.51%) of individuals between 18 and 20 years of age. Here the same situation observed in question 1 is presented again, the students who helped to conduct the survey, took their same classmates to carry out the sampling, which explains the age range presented.

From question 3, there were 17 responses stating that all plastics were the same, arguing that they were composed of the same material. In this case, it is clear that the majority of respondents were aware of the existence of different types of plastics, only 17 of the 236 respondents did not know (7.2%).



Graph 3 Do you consider that there are different types of plastics?
Source: Own Elaboration

In question 4 (graph 3), 90.3% of the answers were affirmative in terms of knowledge of the different types of plastics, a value very close to that found in the answers to question 3.



Graph 4 Which of the following types of plastics do you know?
Source: Own Elaboration

Graph 4 shows interesting results, since a high percentage (close to 75%) of respondents know polyvinyl chloride plastic (PVC), used for the manufacture of pipes. In second place is PET with 71% of affirmations and in third place is polystyrene (unicell) with 61%.

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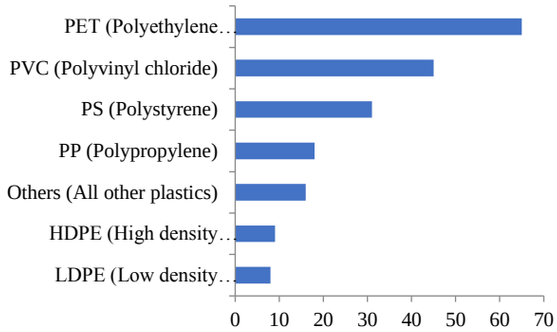
In all three cases, the responses obtained are believed to be due to empirical knowledge of most of the respondents and not due to environmental education.



Graph 5 Which plastics do you use the most?
Source: Own Elaboration

In question No. 6 (Graph 5), it is again congruent with what was observed in question No. 5, empirical knowledge of the different types of plastics.

Finally, in question No. 7, 47% of the individuals did know about the existence of the number code to classify plastics, which would indicate that this percentage includes the students of our institute who belong to the sample and who have received environmental training, but even so they do not reach 76.27% of the individuals who declared having a bachelor's degree.

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We thank the Tecnológico Nacional de México campus Instituto Tecnológico de Chihuahua II for the support provided to carry out this research and especially all the students who participated in the survey, showing enthusiasm and genuine interest in knowledge and commitment to environmental preservation.

7. Conclusions

The survey served to observe that there is a great lack of knowledge in our community about the different types of plastics that exist, which prevents them from being segregated and classified.

One of the suggested strategies is to use social networks to generate a connection, first locally, then nationally and later internationally, to create ecological awareness in society.

The dissemination in social networks can be carried out mainly through Facebook, Instagram, Podcast and TikTok, in such a way that a community is created in which valuable and interesting content is shared on a daily basis that attracts young people due to the widespread use of these media nowadays.

Another suggested strategy is the implementation of ecological clubs that are not optional, but that contribute credits to the curricula of the different careers within the educational institutions, in such a way that allows a proactive environmental education.

It is known, from personal experience, that in environmental education, one thing is what an individual thinks and knows and another is what he/she does.

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Teaching practice in higher education. Analysis from educational models

Práctica docente en educación superior. Análisis desde los modelos educativos

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Abstract

The objective of this study is to describe the teaching practice from the experience of the students, based on the knowledge that teachers have about the subject, the pedagogical abilities or skills they possess, interpersonal relationships, personality characteristics, research associated with the chair, and planning. The method was quantitative with a descriptive scope and cross-sectional design, it was applied in 106 surveys to students of the Psychology Academic Unit of the Autonomous University of Zacatecas, in the State of Zacatecas, Mexico. A self-made instrument called "Teaching practice questionnaire, student perception" was applied with a "Cronbach's Alpha" of 0.93. It was found that if the teacher is critically trained, assesses the teaching and learning processes through dialogue, interacts with other teachers, and builds and lives values in their educational and social context, they will be in agreement with a practice close to a paradigm constructivist.

Teacher training, Higher education, Educational models

Resumen

El objetivo del presente estudio es describir la práctica docente desde la experiencia de los alumnos, en función del conocimiento que los maestros tienen sobre la materia, las habilidades o destrezas pedagógicas que poseen, las relaciones interpersonales, las características de personalidad, la investigación asociada a la cátedra, y la planificación. El método fue cuantitativo de alcance descriptivo y diseño transversal, se aplicaron 106 encuestas a estudiantes de la Unidad Académica de Psicología de la Universidad Autónoma de Zacatecas, del Estado de Zacatecas, México. Se aplicó un instrumento de elaboración propia denominado “Cuestionario de práctica docente, percepción de estudiantes” con un “Alfa de Cronbach” de 0.93. Se encontró que si el docente se forma de manera crítica, realiza valoraciones de los procesos de enseñanza y aprendizaje a través del diálogo, interactúa con otros docentes y construye y vive valores en su contexto educativo y social estará conformando una práctica cercana a un paradigma constructivista

Formación de docentes, Enseñanza superior, Modelos educativos

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Introduction

In higher education, it can be seen that teaching practices, largely delimited by the curriculum, do not respond to the type of comprehensive training required by the subject and the strengthening of humanistic approaches (United Nations Educational, Scientific and Cultural Organisation, UNESCO, 2017).

Effective teaching practice is associated with teachers' capacity for innovation, and is also a value that educational policies are committed to in the current situation of change. In this sense, Torres (2020) defines innovation as the implementation of changes in training that produce improvements in learning outcomes, and also points out that in order to be considered educational innovation, the process must respond to needs, must be effective and efficient, as well as sustainable over time and with results that are applicable to any context.

UNESCO (2015) recognised that the role of the teacher is crucial to renew educational practices and culture, as well as to promote new teaching methodologies and new learning experiences, hence awareness of the extent to which university students reflect on the practice of their teachers will enhance the learning objectives, processes and outcomes generated in the classroom.

Teachers who recreate a lecture or teaching practice where the following qualities are appreciated: a) knowledge of the subject b) pedagogical skills or abilities c) optimal interpersonal relationships d) characteristics of a stable personality e) relationship between teaching and research and f) teaching planning; will be developing a practice permeated by the constructivist paradigm of education.

In this order of ideas, the aim is to identify the attributes that characterise teaching practice in higher education and how a constructivist paradigm is configured from this as a model of teaching work, for which the objectives of the study are:

To identify the attributes that characterise the teaching practice of teachers at the Academic Unit of Psychology at the Universidad Autónoma de Zacatecas (UAZ).

To analyse which educational model permeates the teaching work of the teachers of the Academic Unit of Psychology of the Universidad Autónoma de Zacatecas (UAZ).

Teaching practice

There are complex interactions between culture, power, politics and education. Teaching practice, shaped by personal styles, but also by reform processes resulting from educational policies, are closely linked to social processes. However, higher education teaching practice has a preponderant and direct impact on society, because adult graduates are factors of change in their context, and carry as part of their social and cultural capital, much of what they have acquired from the practice of their teachers. It is precisely the relationship between higher education and society that is currently under analysis, for three fundamental reasons: the exhaustion of the educational model, the formation of a new social frame of reference, and the strategic role of knowledge (Villaseñor, 1997). This can be explained as a product or consequence of the crisis of the modern project of education and society that emerged in the 18th century in the West. This crisis places the subject in a post-modern condition, which means that the subject is constituted as a remnant of political, social and cultural conditions that impose a distance that prevents the fulfilment of the objectives of modernity, two of the most important of which are: justice and equality.

It is essential that the ideology of conducting oneself on the basis of solidarity and not solitary freedom is founded at school. In which interdependence is a constant, based on social processes that limit mixophobia and promote mixophilia (Bauman, 2017).

Educational models. From traditional teaching to the conformation of modern educational subjects

Educational institutions as pedagogical devices, allow the construction of forms of interaction and interdependence between teacher and students, as well as between students and students, and consequently, constitute educational subjects, both teachers and students, to the extent that they occupy and make their own the meanings, norms and practices that the device -especially through the school institution- "institutes" for those places (Foucault, 2002).

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The current modern or post-modern devices demand a peculiar, sometimes demanding and demanding university teaching practice in the sense that the teacher is required to have the following:

– Subject knowledge.
– Pedagogical skills or abilities.
– Interpersonal relations.
– Personality characteristics.
– Teaching-research relationship.
– Teaching planning (Fernández, 2015).

Teaching practice acquires particular characteristics, which make it possible to determine whether there is a pedagogical or educational model that characterises it. Pedagogical models or paradigms are characterised by three principles: ontological, epistemological and methodological, which delineate knowledge, research and practices in education. Therefore, every model involves both discursive and practical aspects.

Traditional model. Educational processes revolve around the teacher, with the learner playing a passive role. The form of work and organisation is based on magisterocentrism (Abbagnano, 1994).

Active school model or new school. In this model, the teacher motivates the formation of a collective spirit through his or her practice. It is the teacher, by means of certain devices in conjunction with the school, who forms a cosmovision that is necessarily built in the social relationship. The teacher adapts study methods and procedures to the characteristics of the students. The reign of prohibition no longer reigns for students, so they can act with relative freedom (Obregón, 2006).

Technocratic model. It is permeated by a paradigm of psychology called behaviourism, which of course has been reflected in pedagogical practices. This model represented a technocratic conception applied to teaching. The incipient elements were initially used in the selection and training of military personnel. Subsequently, an educational proposal was articulated (Torres, 2017).

Critical didactics. What is notable in this approach is its re-nationalisation of the social aspects of teaching, as merely theoretical learning is considered insufficient. Emphasis is placed on social activity among all agents of the educational event, which is a rich source of formative experiences (Apple, 2013).

Constructivist model. Several theories converge in the constructivist model, three of the most important of which are: Piaget's psychogenetic theory; Vygotsky's sociocultural theory; and Bruner and Ausubel's cognitive theory (Hernández, 1998). Constructivism is therefore a multiple, eclectic and, in that sense, complex unit. It can answer the questions: how to learn, what to teach, how to teach, why to teach certain content, when to teach, what, when, how, how to evaluate? But it is not a perspective that indicates infallible recipes, but it provides some guidelines: starting from the level of development of the students; ensuring the construction of meaningful learning.

Teaching practice is a social activity exercised by a professional in order to teach, which is determined by the social, historical and institutional context. Practice is therefore an important factor in education; it is the bridge that connects the educational project with the social project. In this sense, it is assumed that teaching practice is a mechanism that encourages students to exercise citizenship from the classroom in its three spheres: democratic participation, respect for diversity and coexistence and peace (Jasso, 2022). From the above, the following hypothetical approach can be deduced: Teaching practice is made up of: a) knowledge of the subject, b) pedagogical skills or abilities, c) interpersonal relationships, d) personality characteristics, e) teaching-research relationship, f) planning; it organises or proposes the bases for the construction of a teaching task centred on the constructivist paradigm that involves answering key questions about the teaching and learning processes (what to teach, how to teach, when to teach, what, how and when to evaluate).

Method

In order to achieve the proposed objectives, we worked with a sample of 106 cases, higher education students from the Academic Unit of Psychology at the Universidad Autónoma de Zacatecas, in the State of Zacatecas, Mexico.

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The sample was obtained through a stratified random probability sampling, corresponding to a population of 515 students. Of the sample, 23 (21.7%) are male and 83 are female (78.3%). 74.6% of the sample is between 21 and 24 years of age, while 25.4% of the sample is between 25 and 35 years of age.

It should be noted that the Bachelor's Degree in Psychology is made up of 10 semesters. Thus, of the cases studied, 16% are from the second semester, 40.6% from the eighth semester and 43.4% from the tenth semester.

A 61-item instrument was designed, called "Practice Questionnaire, Student Perception" with a Cronbach's alpha of 0.93, suggesting consistent reliability. The simple variables that constitute the measurement of the complex variable teaching practice are: subject knowledge, pedagogical skills, interpersonal relationships, personality characteristics, teaching-research relationship, teaching planning (items assess the frequency and implementation of these variables).

It should be noted that for the preparation of tables and graphs, each of the items was recoded into different variables in order to make them more limited and therefore simplify and improve the analysis, and so ranges were assigned as follows:

- 1 means "very low", with scores ranging from 0 to 20.
- 2 means "low" agglutinates scores from 21 to 40
- 3 means "medium" agglutinates scores from 41 to 60
- 4 means "high" agglutinates scores from 61 to 80
- 5 means "very high" agglutinates score from 81 to 100

The application was carried out in groups, in school settings, and the consent of each of the participants was requested. After recording the data, frequency measures were carried out.

Results

Frequencies of Teaching Practices

Frequency analyses of the teaching practice component are presented below. Based on the information obtained in table 1, a multiple response frequency calculation is made grouping all the variables of the "Teaching practices" axis (knowledge of the subject, pedagogical skills or abilities, interpersonal relationships, personality characteristics, teaching-research relationship and planning). This shows that 64.2% of students perceive teachers as academics who carry out practices that demonstrate that there is a "high" and "very high" knowledge of the subject, which indicates that there is an appropriate selection of content considered to be scientific, which helps higher education students to acquire concepts (principles, facts, laws), procedures (skills and abilities) and attitudes (values). Similarly, it is understood that the relationship between the contents and the levels of complexity are appropriate for the bachelor's degree level. Regarding the presentation made to the students, it is noted that the teacher uses projects, problems or centres of interest that are relevant to the students.

		Responses
		Percentage
Teaching Practice	Very low	11.8%
	Low	7.3%
	Medium	16.8%
	High	32.2%
	Very High	32.0%
Total		100.0%

Table 1 Teaching practice
Source: Own Elaboration

When referring to the pedagogical skills or abilities that the teacher possesses, 63.2% of the students indicate that teachers organise and manage classroom activities, also guide and give meaning to learning and promote a socioemotional climate. Teachers are concerned with exploring and activating students' prior knowledge. Students also mention that teachers support them in deepening and developing more complex and expert representations of the teaching and learning content.

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Regarding the variable called interpersonal relationships which has to do with intimate/superficial relationships, personal/social relationships and even love relationships, 57% of the students indicated that the relationships are superficial, personal and that bullying and harassment between teacher-student is avoided.

67% of the students surveyed stated that teachers exhibit personality characteristics oriented towards extroversion, agreeableness, straightforwardness, emotional stability and openness to experience. This indicates that personality characteristics contribute to good teaching practice. It is therefore an important element to consider as part of the analysis of teaching practice.

Teaching practice related to research is strengthened, since more than 60% of students express that teachers exercise their power to help them, that teachers continuously analyse their life and professional project. Students perceive that teachers construct their own school work with professionalism. Teachers build theories while respecting the cultural background, they build values, they bet on the affectivity of their students, they fight against the routine of daily practice. Students emphasise that they are trained with a critical conscience.

There is a clear intention on the part of the teachers to update and enrich their teaching, and the students surveyed state that there is a need for teachers to form thinking groups with other researching teachers. With regard to the category of teaching planning, 74% of the students mentioned that they were able to distinguish that their teachers set objectives, organise the conceptual, procedural and attitudinal contents to make them accessible by means of didactic activities and implementing some (didactic) resources.

The results of the frequencies, in general, show that students evaluate teaching practice in higher education as very good and good, as 64.2% of students think so. On the other hand, it is interesting to note that 35.8% of the young people chose the values "very low, "low" and "medium" to evaluate teaching practice, which indicates that the elements that characterise teaching practice in higher education can still be further strengthened in higher education teachers:

– Subject knowledge
– Pedagogical skills
– Interpersonal relationships
– Personality characteristics
– Teaching-research relationship - Teaching planning
– Teaching planning

Where there is a greater area of opportunity for teachers is in teaching-research and pedagogical skills and abilities, since the measurement of these variables shows that the results are concentrated in the "very low", "low" and "medium" range.

From the results, it can be seen that the critical thinking of teachers invested in their teaching can provide them with elements that allow them to develop a practice that is close to what the constructivist paradigm proposes.

Discussion

Cañedo (2013) explains that the planning and execution phases of teaching are the main elements that guide teaching practice, but that both elements are based on the educator's conceptions of learning and teaching. While in this study it is found that the elements that most stand out as part of the teaching work in higher education are research and teamwork to form thinking groups, which leads to assessments of the processes of instruction and knowledge acquisition, this allows the development of educational trends relevant to the context of students. Like Torres (2020), it is found that teaching innovation in higher education schools is crucial and is currently a concern of governments due to the current situation of change. It is also recognised that such innovation has to focus on producing improvements in learning outcomes and must be closely linked to the needs and challenges in the educational field. Therefore, the renewal of teaching practice must go hand in hand with the demands of 21st century learning.

The data obtained show that teachers implement a praxis characterised by a traditional educational paradigm, since it is reflected that the student plays a receptive role, learning is rote and the teacher pretends to be the centre of classroom processes (Hernández, 1998). However, current educational policies demand the development of a teaching practice based on a constructivist model.

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One of the limitations of the research is that it did not include an analysis of the curricular principles of higher education, as well as the curriculum of the Academic Unit of Psychology itself, which would have allowed us to specify how teaching practices are conceived from the "should be" point of view.

Another limitation is that the teaching staff's point of view was not considered in order to evaluate their own practice, which would have helped to contrast the teaching and student perspectives, generating a greater wealth of data and information.

Conclusions

Teaching practice permeated by: a) subject knowledge, b) pedagogical skills or abilities, c) interpersonal relations, d) personality characteristics, e) teaching-research relationship, f) planning; is directly linked to a model with traditional tendencies.

From the configuration and structure of teaching work based on the principles of a model of "critical thinking and teaching", a system of practices linked to the new and constructivist school is instituted.

Critical thinking and teaching as a variable that emerges from the study, is an essential part of teaching practice in Higher Education, and is configured on the basis that teachers bring into play: real and effective coordination with other educators, and the search for loyalty to a common project; the establishment of working groups and the carrying out of assessments of the school reality; attention to the diversity of abilities, interests and learning rhythms, as well as the verification of the scope and achievement of objectives; the setting of objectives (observable features of performance) in each class; and the analysis of policies, ideologies, paradigms and approaches to generate critical thinking, which must be present in their professional work.

When teachers bring the above variables into play, they create a structure that will allow them to generate educational processes from a holistic and constructivist conception.

In general, it was observed in the sample that teaching practices in higher education are good, but there is an area of opportunity in the teaching-research relationship and in pedagogical skills and abilities.Students demand that the practices of their teachers in terms of the teaching-research variable be permeated by the following, that the teacher: exercises the power to help the student; continuously analyses his/her personal and professional life project; builds a teaching practice congruent with his/her position in the world; elaborates the educational discourse every day, gives his/her own eyes, his/her experiences, his/her knowledge so that the students can investigate reality in depth and in depth; constructs theories while respecting the cultural background; constructs values; bets on affectivity towards his students; fights against routine; shares his scientific constructions with the members of the educational community; forms a critical conscience; and forms thinking groups with other teacher-researchers.

Regarding the variable pedagogical skills and abilities, students state that teachers should: organise and manage classroom activities; guide and give meaning to learning; generate a socio-emotional climate; explore and activate prior knowledge; and support the deepening and elaboration of more complex and expert representations of teaching and learning content.

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Introduction

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General explanation of the subject and explain why it is important.

What is your added value with respect to other techniques?

Clearly focus each of its features

Clearly explain the problem to be solved and the central hypothesis.

Explanation of sections Article.

Development of headings and subheadings of the article with subsequent numbers

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Including graphs, figures and tables-Editable

In the article content any graphic, table and figure should be editable formats that can change size, type and number of letter, for the purposes of edition, these must be high quality, not pixelated and should be noticeable even reducing image scale.

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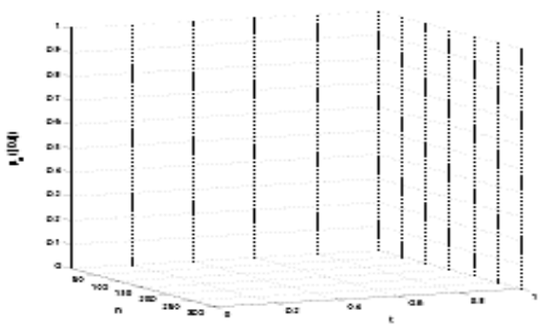

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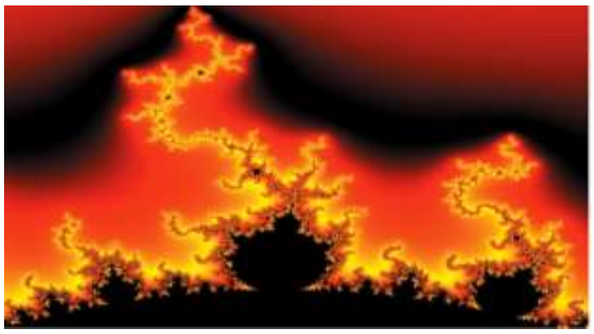

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$$Y_{ij} = \alpha + \sum_{h=1}^{r} \beta_h X_{hij} + u_j + e_{ij} \quad (1)$$

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Methodology

Develop give the meaning of the variables in linear writing and important is the comparison of the used criteria.

Results

The results shall be by section of the article.

Annexes

Tables and adequate sources

Thanks

Indicate if they were financed by any institution, University or company.

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Conclusions

Explain clearly the results and possibilities of improvement.

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