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Journal of Technical Education

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Presentation of the Content

In the first article we present *Predictive model for the analysis of academic performance and preventing student dropout using machine learning techniques*, by LÓPEZ-GARCÍA, Lourdes, LINO-RAMÍREZ, Carlos, ZAMUDIO-RODRÍGUEZ, Víctor Manuel and DEL VALLE- HERNÁNDEZ, Josué, with adscri´ption in the Tecnológico Nacional de México, Campus León, second article we present *The Flipped Classroom in the oral expression development of English language in students at the teacher training college of Atlacomulco*, by MOLINA-VÁZQUEZ, Gabriel, ORDÓÑEZ-SUÁREZ, Teresa and MENDOZA-GONZÁLEZ, Nancy, with adscription in the *Identification of student profile, learning preferences and postgraduate studies preferences in animation students*, by RODRÍGUEZ-ALANÍS, Francisco de Borja, TOVAR-ROSAS, Claudia Rocio, GARZA-MOYA, Luis Roberto and ARREOLA-BURCIAGA, Josué Mizraim, from the Universidad Politécnica de Gómez Palacio, as fourth article we present *Designing educational materials: a policy adrift?*, by RAMOS-JAUBET, Rocío Isabel, CEPEDA-GONZÁLEZ, María Cristina, SÁNCHEZ-RIVERA, Lilia and RAMÍREZ-CHÁVEZ, Jorge, with adscription in the Universidad Autónoma de Coahuila.

Content

Article **Journal of Technical Education**
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Predictive model for the analysis of academic performance and preventing student dropout using machine learning techniques

Modelo predictivo para el análisis del rendimiento académico y prevenir la deserción estudiantil utilizando técnicas de aprendizaje automático

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Abstract

School dropout is one of the biggest problems in the country of Mexico, there are several factors that cause it, so it is necessary to propose strategies and lines of action to reduce it. This document analyzes a database with the demographic and social characteristics of high school students, which were collected through the application of school questionnaires and reports, in order to detect the factors that cause students to drop out of school, as well as to identify in time the students who need personalized counseling to offer them educational guidance and prevent them from dropping out of school, this analysis was implemented through machine learning techniques by developing a predictive model with the gradient descent algorithm, from the results to check the forecast errors by applying the mean square error metric, to estimate the possible prediction errors of the model, it is expected to have a great social impact by applying these machine learning techniques in educational community achieving that students can strengthen their comprehensive training, in addition to guiding their talents and interests.

Predictive model, Gradient descent, School dropout

Resumen

La deserción escolar es una de las problemáticas más grandes en el país de México, son diversos los factores que la causan por lo que es necesario proponer estrategias y líneas de acción para abatirla. En el presente documento se analiza una base de datos con las características demográficas y sociales de los alumnos de secundaria, que se recopilaron con la aplicación de cuestionarios escolares e informes, con la finalidad de detectar los factores que son causantes de la deserción escolar, así mismo identificar a tiempo a los alumnos que necesitan asesorías personalizadas para ofrecerles orientación educativa y evitar que abandonen sus estudios, dicho análisis se implementó mediante técnicas de aprendizaje automático elaborando un modelo predictivo con el algoritmo de descenso de gradiente, a partir de los resultados poder comprobar los errores de pronóstico aplicando la métrica de error cuadrático medio, para estimar los posibles errores de predicción del modelo, se espera tener un gran impacto social al aplicar estas técnicas de aprendizaje automático en comunidad educativa logrando que los alumnos puedan fortalecer su formación integral, además de orientar sus talentos e intereses.

Modelo predictivo, Descenso de gradiente, Deserción escolar

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Introduction

This document begins with a summary of the topic to be developed, followed by the introduction containing an explanation of the topic in general, the problem to be solved and the central hypothesis, giving a solution to the problem in question, followed by the method and technique used for the development of the project, then the conclusion of the document was written thinking about the limitations of the work done and a proposal for improvement for future work. Finally, the references contain the bibliographic data implemented for the elaboration of the research.

One of the objectives of the analysis of educational data is to find patterns and predictions that allow characterizing the academic development of students, however, it is required the collection of data on the characteristics of students taking into account the context, in order to achieve a better understanding of the results obtained. Some of these characteristics are socioeconomic factors, family and school data of the student (Rico Páez & Gaytán Ramírez, 2022).

It is possible "if machine learning techniques are implemented for the development of a model that allows the prediction of the academic performance of secondary education students, as an effective tool for educational institutions can prevent school dropout", since knowing those students who need counseling and educational guidance, can prevent them from abandoning their studies and significantly reduce school dropout.

For the above described in this work, we analyzed the data of high school students with social demographic characteristics that were collected through reports and school questionnaires, using *Python* programming language, and also applied machine learning techniques to develop a predictive model using the *gradient descent algorithm* and from the data we estimated the probabilities and distributions of the objects of interest, so as to compare the forecast errors by applying the *mean square error metric* to estimate the possible prediction errors of the model.

Related Works

The factors that influence university dropout are multi-systemic, and the strategies used by the different higher education institutions to increase the retention of their students take preponderance (Henríquez Cabezas & Vargas Escobar, 2022).

In recent years, *Artificial Intelligence* (AI) techniques such as *Machine Learning* (ML) and *Deep Learning* (DL) have had a positive impact on the advancement of different fields of knowledge, including education. Education is an important driver of all societies, enabling individuals to be more productive and solve problems more effectively by generally applying creative approaches. In education, the aforementioned ML techniques have been used for different tasks including dropout prediction and student performance support (Cruz et al., 2022).

The analysis of information with classical statistical tools is a rather complex task, which has motivated the use of *data mining* techniques for this type of problems, mainly in business or commercial areas (Rico Páez & Sánchez Guzmán, 2018).

Data mining is the process of extracting useful and understandable knowledge, previously unknown, from stored data. Such analysis process works at the knowledge level with the purpose of finding patterns and relationships, as well as predictive models that provide knowledge patterns for decision making (Rico Páez & Sánchez Guzmán, 2018).

Data mining, applied to education or educational data mining, emerges as a paradigm oriented to design, tasks, methods and algorithms with the aim of exploring data in the educational environment. Therefore, it is proposed that educational data mining aims to discover knowledge and patterns within student data. These patterns characterize student behavior based on their achievements, assessments, and mastery of knowledge content (Rico Páez & Sánchez Guzmán, 2018).

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Methodology

Tools used

The project was coded with *Python* programming language, which is the most efficient for data science. In the data processing section, the pandas libraries were imported, Numpy specifically for linear algebra, Seaborn for data visualization and finally Matplotlib for the creation of predictive model graphics, together with Scikit-learn, which is a collection of algorithms.

Data set

The logistic regression model was developed from a dataset of student achievement in secondary education (Cortez & Silva, 2008). The data attributes include social demographic characteristics and are related to two schools, were collected through school reports and questionnaires.

Two sets of data are provided about achievement in two different subjects: mathematics and Spanish. The target attribute for the data analysis is: 'final grade' as it corresponds to the final average for the year.

Data processing

The variable 'school' was used to separate the data set into two strata and perform a sampling, which can be seen in Table 1:

	School	Sex	Ege	Addres	Family	Stat
0	GP	F	18	U	GT3	A
1	GP	F	17	U	GT3	T
2	GP	F	15	U	LE3	T
3	GP	F	15	U	GT3	T
4	GP	F	16	U	GT3	T

Table 1 Data reading
Source: Own elaboration

The technique of cross validation with random permutation or *ShuffleSplit* was implemented for statistical analysis and to obtain other measures of estimated performance, such as mean and variance, so as to know the performance of the data and the training/testing rates, likewise for the creation of the machine learning model, the variable of 'school' was used, with stratified sampling where the data set was divided into 80% test and 20% training. The purpose of implementing the *ShuffleSplit* cross validation was to return the stratified random folds, these folds are made preserving the percentage of samples for each class, as follows: Table 2:

	School	Sex	Age	Address	Family
464	MS	M	16	R	GT3
595	MS	M	18	U	LE3
268	GP	M	17	R	LE3
346	GP	M	17	U	LE3
528	MS	F	17	R	GT3

Table 2 Training set
Source: Own elaboration

The main measures of central tendency and some basic descriptive statistics were returned for each variable in the data sheet, as shown in Table 3 of the data set with the respective percentiles (division of an ordered series of data).

	0	1	2
count	519.000000	519.000000	519.000000
mean	16.739884	2.549133	2.344894
Std	1.223865	1.117168	1.102178
min	15.000000	0.000000	0.000000
25%	16.000000	2.000000	1.000000
50%	17.000000	2.000000	2.000000
75%	18.000000	4.000000	3.000000
max	22.000000	4.000000	4.000000

Table 3 Descriptive statistics
Source: Own elaboration

Correlation matrix

For the analysis of the data, potential relationships between the variables being analyzed were explored, using the statistical measure called *Pearson's correlation*, which indicates the magnitude and direction of the relationship that could exist between two variables, and for this purpose the correlation matrix was calculated.

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Standardization of nominal variables and binary variables

The data set contains nominal variables and binary variables, for this reason it was necessary to separate them using the *OneHotEncoder* functions for the numerical variables and *OrdinalEncoder* for the categorical variables, and *StandardScaler* to standardize these variables, in order to avoid any error in the predictive model, as shown in Table 4:

	0	1	2
count	519.000000	519.000000	519.000000
mean	0.348748	0.416185	0.707129
Std	0.477034	0.493401	0.455519
min	0.000000	0.000000	0.000000
25%	0.000000	0.000000	0.000000
50%	0.000000	0.000000	1.000000
75%	1.000000	1.000000	1.000000
max	1.000000	1.000000	1.000000

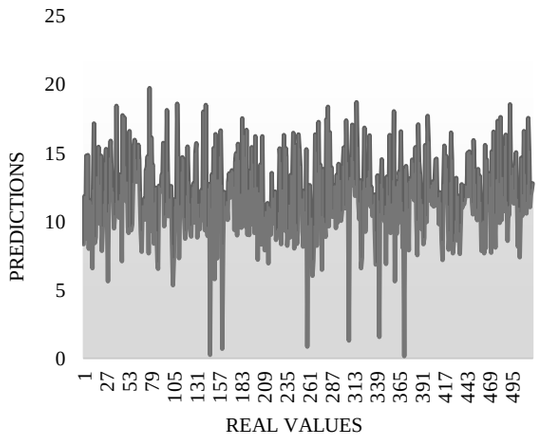
Table 4 Descriptive statistics of the standardized variables
Source: Own elaboration

Gradient descent

For the coding of the *gradient descent algorithm* we used the parameters (m and b) that refer to unknown constants called coefficients, it is the quotient between the interaction obtained from both variables and the sum of quadratic of the values of the dependent variable, in such a way that these parameters minimize the *cost function*, which was calculated with the best possible vector directly for the global minimum, the *cost function* is used to calculate the loss based on the predictions made. The mathematical formula for calculating the *cost function* is:

$$y = f(x) = wx + b \tag{1}$$

Figure 1 shows the results obtained in the execution of the *algorithm*:



Graphic 1 Gradient descent algorithm predictions
Source: Own elaboration

Evaluation of the predictive model by applying the root mean square error (RMSE) metric.

Subsequently after obtaining the model predictions, the root mean square error technique was used to measure the differences between the predicted and observed values of the model, as well as to fit the data in order to compare the forecast errors of the downward gradient model.

The root *mean square error* or root mean square deviation (RMSD) is the square root of the average of the squared errors. RMSD is a measure of accuracy for comparing forecast errors of different models for a particular data set. the formula for calculating it is:

$$RMSE = \sqrt{\frac{1}{n}\sum_{j=1}^{n}\left(y_j - \hat{y}_j\right)^2} \tag{2}$$

To evaluate the performance and accuracy of the *algorithm*, the *linear regression* function was implemented with the *sklearn* library, this step is particularly important to compare how well the techniques used work with the data analyzed.

Results

Interestingly, when applying *Pearson's* correlation technique it was detected that the variables in the data set that have the highest correlation with the interest of high school students to continue studying high school are the school they attend, gender, the place where they live, whether they have access to the Internet and the mother's job.

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As for the evaluation of the results of the algorithm, as shown in Table 5 "*Mean square error*", when comparing the mean square error metric of both *linear regression* and *gradient descent* models, it can be seen that both are almost identical, but it was easier and faster to implement the linear regression technique.

Gradient descent	Linear regression
1.1704544935329404	1.1704456199971924

Table 5 Root mean square error
Source: Own elaboration

Graph 1 shows the predictions obtained as a result of the algorithm execution, and it can be seen that the predictive model was adjusted to the data set since the RMSE has a smaller value, in other words, it quantified them, so that closer values were obtained between the predicted and observed values.

Obtaining a root mean square error value of 1.170 means that the *algorithm* was very accurate since a low RMSE value indicates a better fit.

Conclusions

Speaking of technical limitations, when testing several *algorithms* to select the one that would work best, it takes too much time to train the *algorithm* and a large amount of data was used, which can cause errors, and finally the model parameters are difficult to interpret.

As a proposal to improve the present project, it is necessary to include more student information from different fields; therefore, it is expected to collect a larger data set with the *database* of middle and high school students in order to later apply the model using the new information. In addition, other methods of comparison of data mining techniques can be applied to identify signs of student dropout, based on academic performance, and to perform a classification of students based on their school performance.

Acknowledgments

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The Flipped Classroom in the oral expression development of English language in students at the teacher training college of Atlacomulco

El Flipped Classroom en el desarrollo de la expresión oral del idioma inglés en alumnos de la Escuela Normal de Atlacomulco

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Abstract

The oral competence (speaking) in English language learning for the teacher trainees of the specialty in this language stands out for being one of the bases to be able to develop communication, however, the class sessions are often insufficient to be able to provide the necessary time to practice and develop it, in this sense, innovative methodologies such as the Flipped Classroom, also known as inverted classroom allow the possibility of placing greater emphasis on practice than on theory when trying to advance in the mastery of the language and thereby reduce the lag that may exist in this ability in particular. The main purpose of this research is to implement the Flipped Classroom as a strategy to promote the oral practice of the English language with the use of technological tools and multimedia resources, which as a whole provide the conditions that help to increase the level of mastery of the speaking skill and consequently of the English language through a quantitative study of quasi-experimental design (pretest / posttest) that provides certain guidelines to make the most of class time and thus ground knowledge and materialize it in communicative situations.

Innovative methodologies, Communicative, Insufficient

Resumen

La competencia oral (speaking) en el aprendizaje del idioma inglés para los estudiantes normalistas de la especialidad en este idioma resalta por ser una de las bases para poder gestar la comunicación, sin embargo, las sesiones de clase resultan a menudo ser insuficientes para poder brindar el tiempo necesario de practicarla y desarrollarla, en este sentido, metodologías innovadoras como el Flipped Classroom también conocida como aula invertida ofrecen la posibilidad de poner mayor énfasis en la práctica que en la teoría a la hora de intentar avanzar en el dominio de la lengua en cuestión y con ello abatir el rezago que pueda existir en esta habilidad en lo particular. La presente investigación tiene como principal propósito implementar el Flipped Classroom como una estrategia para favorecer la práctica oral del idioma inglés con el uso de herramientas tecnológicas y recursos multimedia, que en su conjunto brinden las condiciones que coadyuven a incrementar el nivel de dominio de la habilidad oral y consecuentemente de la lengua inglesa por medio de un estudio de corte cuantitativo de diseño cuasiexperimental (pretest / postest) que brinde ciertas pautas para aprovechar el tiempo de clase al máximo y de esta manera aterrizar el conocimiento y materializarlo en situaciones comunicativas.

Metodologías innovadoras, comunicativas, insuficientes

Citation: MOLINA-VÁZQUEZ, Gabriel, ORDÓÑEZ-SUÁREZ, Teresa and MENDOZA-GONZÁLEZ, Nancy. The Flipped Classroom in the oral expression development of English language in students at the teacher training college of Atlacomulco. Journal of Technical Education. 2022. 6-16:6-16.

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Introduction

Currently, achieving a competent level of English language proficiency plays a fundamental role in the professional development of teacher training students under the vision of the Strategy for the Strengthening and Transformation of Teacher Training Colleges (SEP, 2017), which implies a shared task between these teacher training institutions and trainee teachers, also known as "normalistas". In the context of the Escuela Normal de Atlacomulco (ENA), in terms of English language teaching, students from the four different programs offered by the institution (Spanish, history, English and primary) are attended. Taking into account that those students in the English program are required to reach level B2 according to the Common European Framework of Reference for Languages (CEFR), which is equivalent to band 12 (B2) in the National Language Level Certification (CENNI). This scenario extends to the other teacher training colleges in the State of Mexico that offer this specialization.

To teach the courses, the bibliographic material proposed by the English area is used, taking into account the recommendations of the General Directorate of Higher Education for Education Professionals (DGESPE), which suggests working with a book called "Interchange" from Cambridge University Press (CUP). This book is accompanied by additional resources such as an online platform called Cambridge Learning Management System (CLMS), which aims to provide additional support for successful language learning. However, in order for teachers in training to achieve the goal of certifying their level of English according to the proposed goal, the teachers in charge of the courses promote the development of productive skills (speaking and writing) and receptive skills (listening, reading,), with speaking being one of the most difficult to develop due to multifactorial causes such as those listed below:

- The time in which students are exposed to the language is relatively short (6 hours a week).
- Class sessions focus on grammatical exercises and receptive language skills.
- Little time is devoted to oral production.
- Given the number of students, it is difficult for the teacher to provide feedback on oral performance.
- Lack of confidence or insecurity on the part of the students to speak for fear of making mistakes.
- The student has limited resources such as vocabulary to be able to produce orally.

Therefore, it is relevant to implement certain strategies in order to promote this skill as much as possible, since it is of little use if students can solve grammatical exercises, have a good range of vocabulary, read, listen and write if they do not have the ability to materialize all this in a conversation where the interaction is mainly in listening and speaking.

In many learning experiences it seems preferable, at one time or another, to focus on the development of strategies that enable the performance of one or another type of task with a given linguistic dimension. Consequently, the aim is to improve the strategies traditionally used by the learner by making them more sophisticated, broader and more conscious, trying to adapt them to tasks for which they were not originally used. (Common European Framework of Reference for Languages, 2002, p.135).

Using the words of Domínguez et al. (2022) "in the current socio-cultural era, educational practices aim at the development of an autonomous student, responsible and constructor of his learning, so it is necessary to raise innovative proposals that position him at the center of the educational process" (p.2). Based on the above, teachers who teach English as a foreign language must be equipped with a set of methods and strategies that allow them to overcome passivity and low oral production in the classroom.

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It is precisely here where the implementation of methodologies such as the Flipped Classroom or also known as "inverted classroom" play a transcendental role since they allow students to take a more active and leading role in their learning, focusing mainly on the practice and mobilization of the previously acquired knowledge through the use of some media or resources such as videos, audios, PowerPoint presentations, among others.

> The Flipped Classroom methodology means that the work that used to be done at home is now done in class and vice versa. The student receives the information to be learned by reading documents, listening and watching a video explanation and taking notes of what the teacher transmits through virtual media. The transmission of concepts by the teacher and the reception of these by the students are taken out of class time and, the face-to-face time in class is used for the consolidation of knowledge, interaction between students and teacher and for carrying out activities or projects (Fornons and Palau, 2016, p. 2).

Basically, the Flipped Classroom provides the guideline for students to be exposed to the contents to be addressed in class from the comfort of their homes through the use of mainly multimedia resources that have to be previously and carefully selected for a particular purpose. Listed below are some of the reasons given by Bergmann and Sams (2012) for implementing the Inverted Classroom:

- It uses the language of today's students, who grew up with access to the internet, YouTube, Facebook, WhatsApp and many other digital resources. The sad thing is that most of them carry in their pockets a mobile device more powerful than the vast majority of computers in schools and are not allowed to use them.

- It helps busy students. Today's students have a lot of activities, so they appreciate the flexibility of the Reverse Classroom, as they can work ahead with online videos.

- Helps struggling students. When teaching in the traditional way, those who have most of the teacher's attention are the best and the brightest, those who raise their hands first and ask questions; the rest passively listen to the conversation. In contrast, with the Inverted Classroom, more time is devoted to students who are struggling with the topics.

- It allows students to pause and revisit their teacher's explanation. As educators, you generally have a specific curriculum. Students are expected to learn the subject topics, and most of the time they are intended to understand the presentations. With the Reverse Classroom, students are given control. They have the opportunity to process at the speed appropriate for them.

- It increases student-teacher interaction. The flipped classroom creates an ideal fusion of online and face-to-face education.

- The flipped classroom allows for building better relationships with students. Teachers not only teach content, but also inspire, encourage, listen and provide personalized attention to students. This is due to the increased teacher-student interaction. Students are asked to interact through the communication tools available to them.

- It increases student-student interaction. The role of the teacher is no longer a distributor of content and becomes a tutor who leads students to develop their own collaborative groups.

- It can move the Reverse Classroom toward mastery of learning, in which students move through the material at their own pace. Students observe and learn in an asynchronous system where they work toward mastery of the content.

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Thus, Acosta (2022) makes sense when he emphasizes that "the inverted classroom offers the opportunity to make better use of classroom time, while students have already worked at home with digitized materials" (p.337).

Today it is absolutely complex to conceive the teaching and learning process without the implementation of technological resources that, although they have not been created for educational purposes, have great benefits to contribute to the construction of knowledge and, in the specific case of English, it goes without saying that they provide the necessary conditions to increase communication and oral production that takes place inside the classroom, maximizing the possibility that students increase the chances of obtaining good results in this skill in the examination tests to certify their proficiency in the target language. This is how the present project becomes relevant when trying to give an answer on how the implementation of the Flipped Classroom pedagogical model promotes and facilitates the development of oral expression of the English language in normal students of the Normal School of Atlacomulco.

Objective

The main objective of this article is to implement the Flipped Classroom as a strategy to promote the oral practice of the English language with the use of technological tools and multimedia resources that together provide the conditions for the construction of meaningful learning that contribute to increase the level of mastery of the English language and facilitate communication in this language, and that all this is reflected in the results generated from the certification of their mastery of the language in question.

Methodology

The type of research to which the present work corresponds is quantitative with a correlational scope since two concepts or variables are associated and quantified. Hernández et al. (2014) argue that "the purpose of this type of study is to determine the relationship or degree of association between two or more concepts, categories or variables in a particular sample or context. Sometimes only the relationship between two variables is analyzed, but frequently links between three, four or more variables are located in the study" (p. 93).

The quantitative approach uses data collection and data analysis to answer research questions and test previously formulated hypotheses, it also relies on the measurement of variables and research instruments, with the use of descriptive and inferential statistics, in statistical treatment and hypothesis testing; the formulation of statistical hypotheses, the formalized design of the types of research; sampling, etc. (Ñaupas, et al., 2018, p.140).

Regarding the design, the quasi-experimental design was selected, which Hernández et al. (2006, cited by Ñaupas, et al. 2018), defines as "designs that work with already formed groups, not randomized, therefore, their internal validity is small because there is no control over extraneous variables. These designs are applied to real situations in which groups cannot be randomly formed, but can manipulate the experimental variable" (p. 362).

In quasi-experimental research, the researcher cannot modify the values of the independent variable at will or create the experimental groups by randomization; however, he can introduce something similar to the experimental design in his data collection.

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Thus, quasi-experimental research would be that in which there is an exposure of the experiment with the same groups and the same variables of the phenomenon under study, since they cannot be modified or manipulated, however, the experimental design allows formulating a hypothesis and specifying the way to obtain the data that produce the responses obtained from the behavior of the phenomenon, which allows corroborating or refuting the hypothesis (Muñoz, 2011, p.97).

Data collection instruments

In the words of Sabino (1992), a data collection instrument is in principle "any resource that the researcher can use to approach the phenomena and extract information from them. In this way, the instrument synthesizes in itself all the research work summarizes the contributions of the theoretical framework by selecting data that correspond to the indicators and, therefore, to the variables or concepts used" (p.88).

In this sense, the "speaking" rubric proposed by the University of Cambridge Local Examinations Syndicate UCLES 2019, which is used in the application of the Preliminary English Test (PET), which is an intermediate level certificate that belongs to the Cambridge English Examination family, was used to collect the information. It corresponds to level B1 of the CEFR and assesses the candidate's knowledge of English in typical day-to-day situations and in particular evaluates four aspects of the student's performance:

- Grammar and vocabulary.
- Speech management.
- Pronunciation.
- Interactive communication.

Assessing speaking performance – Level B1

B1	Grammar and Vocabulary	Discourse Management	Pronunciation	Interactive Communication
5	• Shows a good degree of control of simple grammatical forms, and attempts some complex grammatical forms. • Uses a range of appropriate vocabulary to give and exchange views on familiar topics.	• Produces extended stretches of language despite some hesitation. • Contributions are relevant despite some repetition. • Uses a range of cohesive devices.	• Is intelligible. • Intonation is generally appropriate. • Sentence and word stress is generally accurately placed. • Individual sounds are generally articulated clearly.	• Initiates and responds appropriately. • Maintains and develops the interaction and negotiates towards an outcome with very little support.
4	*Performance shares features of Bands 3 and 5.*			
3	• Shows a good degree of control of simple grammatical forms. • Uses a range of appropriate vocabulary when talking about familiar topics.	• Produces responses which are extended beyond short phrases, despite hesitation. • Contributions are mostly relevant, but there may be some repetition. • Uses basic cohesive devices.	• Is mostly intelligible, and has some control of phonological features at both utterance and word levels.	• Initiates and responds appropriately. • Keeps the interaction going with very little prompting and support.
2	*Performance shares features of Bands 1 and 3.*			
1	• Shows sufficient control of simple grammatical forms. • Uses a limited range of appropriate vocabulary to talk about familiar topics.	• Produces responses which are characterised by short phrases and frequent hesitation. • Repeats information or digresses from the topic.	• Is mostly intelligible, despite limited control of phonological features.	• Maintains simple exchanges, despite some difficulty. • Requires prompting and support.
0	*Performance below Band 1.*			

TOTAL: _____

Figure 1 Rubric to evaluate performance in oral skills
Source: University of Cambridge Local Examinations Syndicate (UCLES) 2019

The preliminary B1 assessment scales are divided into six bands from 0 to 5, with 0 being the lowest and 5 being the highest. Descriptors are provided for each criterion for bands 1, 3 and 5 and indicate what the candidate is expected to demonstrate in each band.

The rubric was applied to the experimental group to measure the performance of each of the students in the oral ability in the English language at the end of the first and third midterm of semester 2021 - 2022 (At the beginning: Pretest and at the end: Posttest).

Results

Group English B1.D (n2=22) Experimental group	Sex Male	 Male	Total
Total	6	26	32
Group	6	26	n=32

Table 1 The sample according to sex
Source: Own elaboration

Interpretation

From the table it is stated that the sample of subjects participating in the research are 32 students of the Normal School of Atlacomulco those who belong to the first, third and fifth semester of the Bachelor's Degree in Teaching and Learning English in Secondary Education that belong to the Experimental Group.

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In the same way, it is observed that most of the students evaluated are female (26) which constitute 81% and the male students are 6 and represent 19% of the study sample.

Results of the pretest oral proficiency scores

		Frequency	Percentage
Scores	11	4	12.5%
	12	9	28%
	13	5	16%
	14	7	22%
	15	4	12.5%
	16	2	6%
	17	1	3%
	Total	32	100%

Table 2 Pretest oral ability scores
Source: Own elaboration

Interpretation

Table 2 shows that the Mode (Mo) is 12, while the median (Me) of the scores obtained by the students in the pretest is 14, likewise, it is observed that the lowest score obtained is 11 points and the maximum score obtained is 17 points.

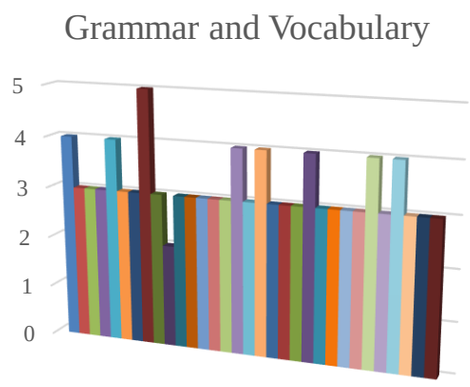
Results of the levels of the pretest indicators

Levels	Frequency	Percentage
5 (Excellent)	1	3%
4 (Outstanding)	7	22%
3 (Good)	23	72%
2 (Fair)	1	3%
1 (Acceptable)	0	0%
0 (Insufficient)	0	0%
Total	32	100%

Table 3 Grammar and vocabulary levels of the pretest task
Source: Own elaboration

Interpretation

Table 3 shows that 72% (23) of the students reached a Good level in terms of mastering English grammar and vocabulary, while 22% (7) of the students reached an Outstanding level in the indicator in question. The rest of the students, representing 6% (2), are at the Excellent and Fair levels respectively.



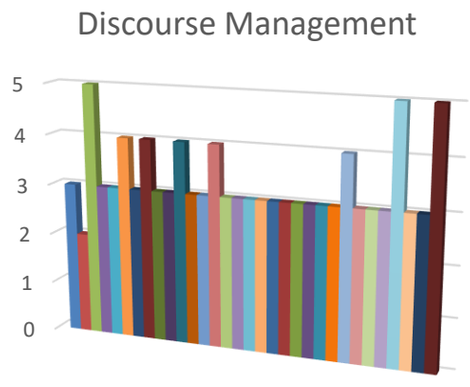
Graphic 1 Indicator 1 Grammar and Vocabulary
Source: Own elaboration

Levels	Frequency	Percentage
5 (Excellent)	3	10%
4 (Outstanding)	5	16%
3 (Good)	22	68%
2 (Fair)	2	6%
1 (Acceptable)	0	0%
0 (Insufficient)	0	0%
Total	32	100%

Table 4 Levels of discourse management in the pretest task
Source: Own elaboration

Interpretation

Table 4 shows that 68% (22) of the students reached a Good level in terms of command of English grammar and vocabulary, while 16% (5) of the students reached an Outstanding level in the indicator in question. The rest of the students, representing 16% (5), are at the Excellent (3) and Fair (2) levels respectively.



Graphic 2 Indicator 2 Discourse management
Source: Own elaboration

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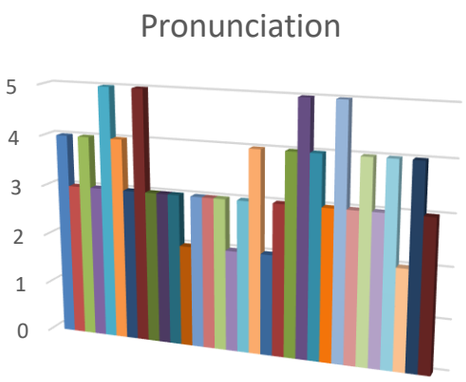
Levels	Frequency	Percentage
5 (Excellent)	4	13%
4 (Outstanding)	9	28%
3 (Good)	15	46%
2 (Fair)	4	13%
1 (Acceptable)	0	0%
0 (Insufficient)	0	0%
Total	32	100%

Table 5 Pronunciation levels in the pretest task
Source: Own elaboration

Interpretation:

Table 4 shows that 46% (15) of the students reached a Good level in terms of mastery of English grammar and vocabulary, while 28% (9) of the students reached an Outstanding level in the indicator in question. The rest of the students, who together represent 26% (8), are at the Excellent (4) and Fair (4) levels respectively.



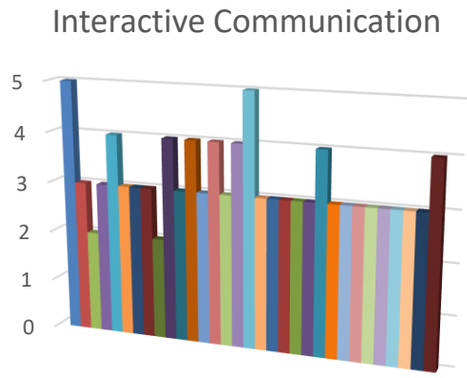
Graphic 3 Indicator 3 pronunciation
Source: Own elaboration

Levels	Frequency	Percentage
5 (Excellent)	2	6%
4 (Outstanding)	7	22%
3 (Good)	21	66%
2 (Fair)	2	6%
1 (Acceptable)	0	0%
0 (Insufficient)	0	0%
Total	32	100%

Table 6 Levels of interactive communication in the pretest task
Source: Own elaboration

Interpretation

Table 4 shows that 66% (21) of the students reached a Good level in terms of mastery of English grammar and vocabulary, while 22% (7) of the students reached an Outstanding level in the indicator in question. The rest of the students, who together represent 12% (4), are at the Excellent (2) and Fair (2) levels respectively.



Graphic 4 Indicator 4 Interactive communication
Source: Own elaboration

Results of the post-test oral proficiency scores

		Frequency	Percentage
Scores	11	1	3%
	12	4	12.5%
	13	5	16%
	14	4	13%
	15	7	22%
	16	5	12.5%
	17	3	9%
	18	3	9%
	Total	32	100%

Table 7 Posttest oral ability scores
Source: Own elaboration

Interpretation

Table 7 shows that the Mode (Mo) is 15, while the median (Me) of the scores obtained by the students in the pretest is 14.5, likewise, it is observed that the lowest score obtained is 11 points and the maximum score obtained is 18 points.

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Results of the levels of the post-test indicators

Levels	Frequency	Percentage
5 (Excellent)	5	16%
4 (Outstanding)	14	44%
3 (Good)	12	37%
2 (Fair)	1	3%
1 (Acceptable)	0	0%
0 (Insufficient)	0	0%
Total	32	100%

Table 8 Grammar and vocabulary levels of the posttest task
Source: Own elaboration

Interpretation

Table 3 shows that 44% (14) of the students reached an Outstanding level in terms of mastery of English grammar and vocabulary, while 37% (12) of the students reached a Good level in the indicator in question. The rest of the students, representing 19% (6), are at the Excellent (5) and Fair (1) levels respectively.

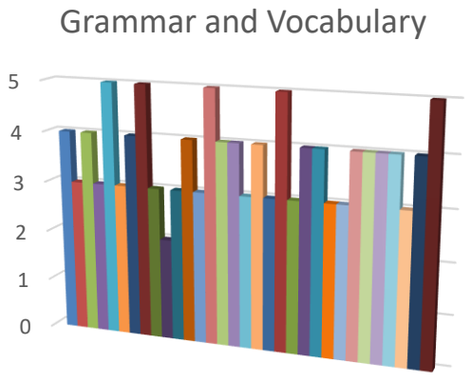

Figure 5 Indicator 1 Grammar and Vocabulary
Source: Own elaboration

Levels	Frequency	Percentage
5 (Excellent)	3	9.5%
4 (Outstanding)	10	31%
3 (Good)	16	50%
2 (Fair)	3	9.5%
1 (Acceptable)	0	0%
0 (Insufficient)	0	0%
Total	32	100%

Table 9 Levels of discourse management in the posttest task.
Source: Own elaboration

Interpretation

Table 4 shows that 50% (16) of the students reached a Good level in terms of command of English grammar and vocabulary, while 31% (10) of the students reached an Outstanding level in the indicator in question. The rest of the students, representing 19% (6), are at the Excellent (3) and Fair (3) levels respectively.

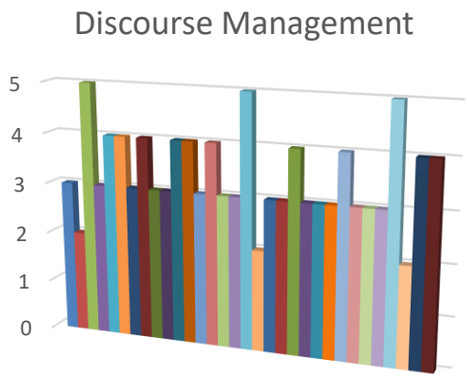

Figure 6 Indicator 2 Discourse management
Source: Own elaboration

Levels	Frequency	Percentage
5 (Excellent)	6	19%
4 (Outstanding)	11	34%
3 (Good)	14	44%
2 (Fair)	1	3%
1 (Acceptable)	0	0%
0 (Insufficient)	0	0%
Total	32	100%

Table 10 Pronunciation levels in the posttest task
Source: Own elaboration

Interpretation

Table 4 shows that 44% (14) of the students reached a Good level in terms of mastery of English grammar and vocabulary, while 34% (11) of the students reached an Outstanding level in the indicator in question. The rest of the students, who together represent 22% (7), are at the Excellent (6) and Fair (1) levels respectively.

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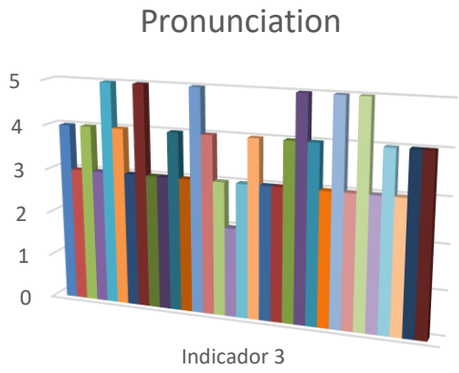


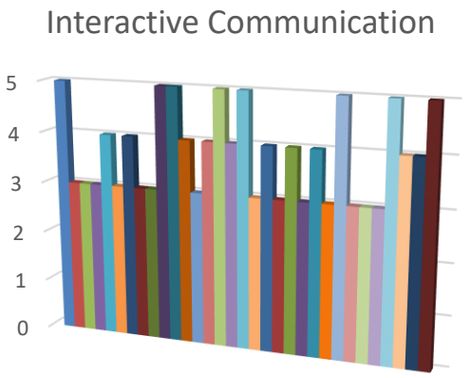
Graphic 7 Indicator 3 pronunciation
Source: Own elaboration

Levels	Frequency	Percentage
5 (Excellent)	8	25%
4 (Outstanding)	10	31%
3 (Good)	14	44%
2 (Fair)	0	0
1 (Acceptable)	0	0
0 (Insufficient)	0	0
Total	32	100%

Table 11 Levels of interactive communication in the posttest task
Source: Own elaboration

Interpretation

Table 4 shows that 44% (14) of the students reached a Good level in terms of mastery of English grammar and vocabulary, 31% (10) of the students reached an Outstanding level in the indicator in question, while the rest of the students 25% (8) are at the Excellent level.



Graphic 8 Indicator 4 Interactive communication
Source: Own elaboration

Conclusions

There is no doubt that the implementation of the Flipped Classroom model leads to modify in a certain way the way of working in traditional education, since by applying the principles of this model, learning is managed in such a way that the student adopts a more participatory and active role. As the New Mexican School NEM rightly points out, "Pedagogical work makes sense when designing, constructing, selecting diverse methodological strategies that contribute to student learning" (SEP, 2019, p.21).

The oral competence of the students can be notably favored with the implementation of the Flipped Classroom since the material used, in addition to preparing the necessary conditions for practice, gives the added value of exposing students to different ways of explaining and understanding the contents, and in the case of videos, one can even accustom the ear to different accents.

The teacher in charge of the English course adopts the role of learning facilitator by carefully selecting the material to be used to develop communicative competence and improve aspects such as grammar, pronunciation and listening comprehension. Thus, learning breaks the walls of the classroom and becomes a flexible and dynamic process.

With the implementation of the methodology in question, teachers gain experience on the type of materials that have the best effect on English language learners and at the same time find new ways to explain or facilitate the contents in case there are doubts.

The planning of the teaching-learning process promotes autonomy and develops in students the ability to take responsibility for the construction of their knowledge in which not only oral competence is strengthened, but also the receptive part of the language, which prepares students to be able to interact with other people.

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The Flipped Classroom methodology used in an effective way offers a large number of solutions for English language teachers when activating and building knowledge in students, it also becomes a great ally when it comes to advancing in the mastery of oral skills, which helps students to communicate effectively in everyday situations and transcend beyond accrediting a proficiency test.

Contributions

This study means an option for the English major students on how to approach the contents once they are in charge of a group, since in some way they will identify activities and strategies that can be implemented in the context in which they will be working. Basically, they will have more resources to draw on when carrying out their teaching work.

This can be taken as a reference for the teachers of the institution on the innovative methodologies that they can implement in order to facilitate the acquisition of the English language or any other type of content marked in the study plans and/or programs; in this way, the learning styles of the students will be favored for the construction of knowledge.

Finally, similar studies could be carried out in other contexts based on the results of the present work with a similar or different approach in order to gain more experience on how to make the most of the Flipped Classroom methodology and the technological tools that can be used with it.

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Identification of student profile, learning preferences and postgraduate studies preferences in animation students

Identificación del perfil, preferencias de aprendizaje y de estudios de posgrado en alumnos de animación

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Abstract

The professional careers related to graphics and art, including film animation, have a profile of the academic participant very particular, different from other university careers, young people who learn mainly through doing, instead of cognitive reflection in itself, so teaching is usually taught with a rather vigotsky approach, in a context where knowledge is situated, product of activity, context and culture. Where the teacher usually works using a set of strategies for meaningful learning based on situated and truly experiential teaching: authentic problem solving, learning in action and service, case analysis, project implementation, site simulations, etc., all in terms of their potential to promote the desired competences in the subject (Rodríguez Alanís, Garza Moya, Tovar Rosas, Arreola Burciaga, & Pérez Barraza, 2022). In this context, it is necessary to have scientific evidence that allows elucidating the profile of entry and exit of the student of an animation career, as well as their learning preferences, with a view to the possible curriculum design of an ex professor postgraduate course for graduates of that professional career, the present research being carried out through a qualitative-quantitative study.

Educational diagnosis, Curriculum design Postgraduate studies, Animation students

Resumen

Las carreras relacionadas con la gráfica y el arte, entre las cuales se encuentra la animación cinematográfica, cuentan con un perfil del participante académico muy particular, diferente al de otras carreras universitarias, jóvenes que aprenden principalmente a través del hacer, en vez de la reflexión cognitiva en sí misma, por lo que la enseñanza suele impartirse con enfoque más bien vigotskiano, en un contexto donde el conocimiento es situado, producto de la actividad, el contexto y la cultura. Donde el docente trabaja empleando estrategias para el aprendizaje significativo basadas en la enseñanza situada y verdaderamente experiencial: la solución de problemas auténticos, aprendizaje en el actuar y el servicio, análisis de casos, realización de proyectos, simulaciones situadas, etc., todo ello en términos de su potencial para promover las competencias deseadas en la asignatura (Rodríguez Alanís, Garza Moya, Tovar Rosas, Arreola Burciaga, & Pérez Barraza, 2022), haciéndose necesario contar con evidencia científica que permita dilucidar el perfil de ingreso y egreso del estudiante de una carrera de Animación, así como sus preferencias de aprendizaje, con miras al posible diseño curricular de un posgrado ex professo para los egresados de dicha carrera profesional, llevándose a cabo la presente investigación por medio de un estudio de corte cualitativo-cuantitativo.

Diagnóstico educativo, Diseño curricular posgrado, Estudiantes de animación

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Introduction

The so-called "Creative Industries" have advanced significantly in Mexico since 2008, as evidenced by the number of reports, economic data, development expectations, etc. generated since then by both civil society organizations and the Ministry of Economy itself, where Mexico already appeared as one of the top 20 exporters in the global market for creative products, even reaching sixth place among developing countries, and the only Latin American country among the top 20 worldwide (Mission of Mexico to the EU, Representation Office of the Ministry of Economy, 2009).

It is in this context that the Engineering in Animation and Visual Effects (IAEV) was born in 2011 as the first career focused on animation in a Mexican public university: The Polytechnic University of Gomez Palacio, considerably boosting not only the audiovisual industry of the state, but has brought talent to the animation industry, as evidenced by the successful incursion of graduates in national and foreign studios, such was the case of Lety Maycotte -2nd IAEV generation- who has participated in major animated productions such as "Hotel Transylvania 3", "Detective Pikachu", "Frozen 2", as well as in the winner of the Golden Globe, BAFTA and Oscar for best animated film in 2019 "Spiderman: A New Universe" (Rodríguez, 2019).

Thus, it seems a good time to promote the creation of a postgraduate program to help strengthen this career and industry, since the implementation of postgraduate programs is important as a potential trigger for the economies of developing countries, as suggested by the IDB in its report "Science, technology and innovation in Latin America and the Caribbean: A statistical compendium of indicators" (Crespi, Navarro, & Zuñiga, 2010), in addition to the fact that currently the few that exist in that country are found only in private universities, being an area of opportunity for professional public education in Mexico. For this it is important to know aspects such as the profile of entry and exit of students in the last year of IAEV, their learning preferences, as well as the motivations that these students might have to study a graduate degree and of course needs and issues that should have an effective graduate and continuing education program related to animation.

The curriculum planning process is one of the determining moments in the development of new educational options. (Chaparro Sánchez, Escudero Nahón, & Morales Barrera, 2017). and the aforementioned information would allow for a more methodological and therefore precise curriculum design, since the conceptual development of the theory-practice link as a field of study and application has a broad impact on the definition of the curriculum. (Casarini-Ratto, 1997).

Discerning curriculum design as the systemic approach to educational problems, it should be taken into consideration that it implies initial assumptions, planning and conceptualization phases. In this sense, Dr. Frida Díaz-Barriga recommends four phases in curriculum design:

- Career rationale.
- Elaboration of the professional profile.
- Curricular organization and structuring.
- Continuous evaluation of the curriculum.

(Díaz-Barriga Arceo, Lule Gonzalez, Pacheco Pinzón, Saad Dayán, & Rojas-Drummond, 2012).

In this regard, Gómez and Herrera warn about the importance of study programs in student motivation, warning against the little attention that is usually paid to the postgraduate level in this area, where the possibility of desertion is greater when the needs of undergraduate students (as well as those of university students) regarding the achievement of their expectations are usually considered as irrelevant, so they urge (citing Chabolla, 2001 and Vera, 2009 respectively) to take care of the design of such programs following scientific and methodological bases to validate the needs and interests of students reflected in such programs. This is particularly true in arts-based postgraduate programs, since beyond the traditional questionnaires where they seek to know predilections and interests, likes and dislikes, little importance is usually given to artistic activities as such, sometimes resulting in dissociated programs.

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An important point about this is what has to do with art pedagogy, since, as Gómez and Herrera (citing Acha) point out once again, teachers in art-related careers are usually relatively updated in terms of traditional pedagogical practice, but little willing to innovate in the didactics of art teaching and its techniques, hence the importance of knowing the student's learning preferences.

The problem of theory and practice is one of the most important in curriculum design, so that evaluation and research "from within", as Casarini points out, can be considered as a solution to this problem. Currently, research in the area of the arts, within university education, is one of the topics most widely explored by renowned researchers, given the importance of this field (art) for economies, societies and education itself. (Barriga Monroy, 2011). Thus, UNESCO speaks of contextualizing theory through the practice of artistic disciplines, from a multidisciplinary approach, where research in arts education must then study the artistic discipline, at the same time as the educational field. (UNESCO, 2006).

As far as the motivation to study a postgraduate course is concerned, the inclination for an activity is awakened by a need - of physiological or psychological origin - that breaks the state of equilibrium existing up to that moment, creating a state of tension/dissatisfaction that then drives to action, so that the tension is then discharged and once the need is satisfied, the organism returns to its original state of equilibrium. (Carrillo, Padilla, Rosero, & Villagómez, 2009). One of the objectives behind the present research will be to determine the existing motivations in an undergraduate student to be interested in studying a postgraduate degree.

Finally, knowing through firm statistical data the profile of the final year animation student, both in terms of entering the career and graduating, beyond simply writing such profiles, allows through statistical data to check to what extent the student complies with them, and therefore contextualize the curricular design of a possible graduate program, since statistical techniques enable the description of groups of data, as well as inference focused on broader sets.

General objective

To evaluate the formative needs for graduate studies in Animation and Visual Effects Engineering at the Polytechnic University of Gomez Palacio, Durango, Mexico.

Specific objectives

I. To identify the entry and exit profiles of students in the last year of the Animation and Visual Effects Engineering program.

II. To identify learning preferences in IAEV senior students.

III. To point out the motivations existing in an undergraduate student to be interested in studying for a postgraduate degree.

IV. Explore the possible lines of training and contents of future postgraduate programs at IAEV.

V. Determine interests in graduate studies or specialization in IAEV's final year students.

Methodology to be developed

Statistical techniques make possible the description of groups of data, as well as inference focused on broader sets. The methods developed by Statistics constitute an important instrument for scientific study, so they can be applied in different fields of knowledge, including the social sciences, one of them being educational research, where statistical techniques are particularly useful in positivist research and, specifically, in the data analysis phase, where it is possible to infer relationships between phenomena, populations and specific contexts (Gil-Flores, 2003). Such is the case of the present research, where we proceeded to the study of a social phenomenon, in this case trying to elucidate the profile of entry and exit of the student of the Animation and Visual Effects Engineering, as well as their learning preferences, with a view to the possible curricular design of a graduate degree ex professo for the graduates of this professional career.

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Therefore, questions related to the possible motivations and inherent professional approach were also asked, through the use of a survey instrument, which gave numerical data collected about a reality or a context, obtaining products from its processing through the application of a systematic work method. The procedures to arrive at these results, consisting of the collection, arrangement and presentation constitute the statistics (thus in singular) that supports the present educational research, whose results.

Population and sample

Arias-Gómez (Arias Gómez, Villasís Keever, & Miranda Novales, 2016) defines the study population as a set of cases, well defined, limited and accessible, which will form the reference for the selection of the sample that meets a series of predetermined criteria. Thus, for this purpose, the study population was taken into account as the 9th and 10th semester students of Animation and Visual Effects Engineering (IAEV) belonging to different IES attached to the subsystem of Technological and Polytechnic Universities. This segment was chosen due to the central theme of this research which revolves around the postgraduate interests of IAEV students, for which it is considered that only students in the last segment of their career can have the professional skills and therefore the intimate knowledge around the professional nature of it, as well as the potential motivation for the study of a postgraduate degree. Likewise, this segment allows measuring other aspects of interest for this study, such as a comparison between the entry and graduation profiles, as well as their learning preferences, among other axes explored, The final population was 110 respondents, of which 39 correspond to the Polytechnic University of Gómez Palacio (UPGOP), 48 to the Polytechnic University of Sinaloa (UPSIN), 15 to the Polytechnic University of Santa Rosa de Jauregui (UPSRJ) and 8 to the Polytechnic University of Bacalar (UPB).

Research instrument and its application

In order to carry out the research, we worked with an instrument composed of 7 research axes, 18 complex variables and 111 simple variables, of which 4 are nominal and 106 are interval variables, using a scale from 0 to 10, the distribution being as follows:

Axes	Complex variables	Simple variables
Information	1 ítem	4 ítems
Person axis	2 ítems	9 ítems
Entry Profile	3 ítems	24 ítems
Profile of graduates	3 ítems	20 ítems
Postgraduate motivation	2 ítems	15 ítems
IES Axis	5 ítems	19 ítems
Postgraduate curriculum design	2 ítems	20 ítems

Table 1 Axes and variables of the research instrument
Source: Own elaboration

The nominal variables were chosen to organize the information according to gender, age, UP where he/she is studying, and to know if at this moment, in the final cycle of his/her career, he/she is formally working in his/her professional field.

The wording of each of the statements was done in the most understandable way for the respondent. At the same time, the instructions were precise and easy to follow, considering that the appropriate features of a form should be: clear and concrete questions, set out in a rigid and pre-established order that cannot be modified, giving rise to brief and concise answers. (García Cordova, 2002). The application of the instrument was done through Microsoft Forms, sharing the link to the IAEV directors of the different participating HEIs who kindly agreed to apply it, remaining active from June 6 to July 30, 2022. Subsequently, the database was downloaded in Excel and imported into the STATISTICA 10 program, obtaining 110 responses (with zero cases of missing data), which is considered a significant representation of the chosen population, obtaining a Cronbach's alpha of .953, which is an excellent percentage of reliability in the instrument. (Frías-Navarro, 2022). The mean of the responses was 790.810 with a standard deviation of 114.918 and a variance of 13206.189.

```
            Number of items in scale: 107
 Number of items with zero variance: 0
             Number of valid cases: 110
  Number of cases with missing data: 0
          Missing data were deleted: casewise

                    SUMMARY STATISTICS FOR SCALE
              Mean:                          790.81090909
Sum: 86989.200000
 Standard            Deviation:              114.91818497
Variance: 13206.189238
           Skewness:                         -1.838565483
Kurtosis:  5.334168369
            Minimum:                         259.00000000
Maximum: 972.00000000
   Cronbach's alpha:   .953504038
```

Figure 1 Cronbach's alpha
Source: Own elaboration

Results

The following are the results of the research carried out by means of parametric analysis of the survey instrument and organized in four sections corresponding to the different statistigraphs that were applied, where from each of them tables were obtained describing the results shown in them.

Univariate

Univariate statistics offers techniques of very frequent use in the processing of information when investigating a single event, or several events independently. These techniques are diverse, each one having a particular procedure, being of particular importance the preparation associated with the criteria of selection, application and interpretation of the diversity of methods of analysis in statistics, particularly univariate analysis. Univariate analysis methods are used to examine and analyze the behavior of individual variables.

To carry out the univariate analysis, the database previously captured in Excel was loaded into the STATISTICA 10 program in order to obtain the measures of central tendency, which make it possible to estimate the average behavior of each variable, with the mode, median and mean being the three most commonly used processes.

Mean: expresses the average value of the variable.

Median: expresses the value of the distribution that divides the sample into two equal or approximately equal parts.

Mode: expresses the value of the most frequently mentioned response. In turn, the standard deviation is obtained, since measures of variability indicate the dispersion of the data on a scale of a certain measurement of the variable considered (Hernández-Sampieri, Fernández-Collado, & Baptista-Lucio, 2014). Hernández Sampieri defines standard deviation as the average of the deviation of the scores with respect to the mean. Thus, the greater the dispersion of the data around the mean, the greater the standard deviation.

Once the results of the processes described above were obtained, the variables were ordered to obtain the upper limit (Med/med+DESVStd) and the lower limit (Med/med-DESVStd), which makes it possible to estimate the behavior of each variable, not only in the two limits, but also in the average limit.

Upper limit

Upper Limit	N	X	Min	Max	S
Correcting your mistakes helps to facilitate learning	101	9.267	0.000	10.000	1.405
Practice makes perfect	101	9.262	0.000	10.000	1.635
He prefers to have mistaken pointed out to him to correct them.	101	9.236	0.000	10.000	1.619
Practical examples are the best way to learn	101	9.020	0.000	10.000	1.699
Assertive and timely feedback enhances learning	101	8.984	0.000	10.000	1.607
He is now a person with values and ethics	101	8.936	0.000	10.000	1.767
Relating new topics to familiar ones helps us to learn better.	101	8.911	0.000	10.000	1.582
Person with values and ethics BEFORE entering the career.	101	8.885	5.000	10.000	1.310
Master's degree or postgraduate teaching degree with professional experience in the teaching field	101	8.870	0.000	10.000	2.245
Fondness NOW for TV series or in Streaming	101	8.734	0.000	10.000	1.836
Working on evidence focused on practical work is a better way of learning	101	8.717	0.000	10.000	1.615
Interest in music NOW	101	8.693	0.000	10.000	2.140
Master's degree or postgraduate degree with Workshops equipped according to the subject matter	101	8.678	0.000	10.000	2.318

Table 2 Upper limit of the univariable
Source: Own elaboration

When analyzing the "Upper Limit" it is possible to observe that the surveyed subjects favor learning preferences that tend to a punctual feedback from the teacher about their areas of opportunity, as well as the realization of practices and the sample of practical examples that are directly related to the subject. In turn, they prefer the teacher to relate previous knowledge with new knowledge, since this pedagogical practice improves learning, which yields positive results regarding the application of transdisciplinarity as part not only of the pedagogical practice, but also of the curricular design for careers and graduate programs of this type. This practical approach is reflected in the decision to prefer a graduate program where the workshops are equipped in accordance with the programmed subjects. In turn, the preference for a physical teacher, although it appears as part of the "Middle Limit", is so close to the "Upper Limit" of the table that its relation to this point is evident.

Middle boundary

Most of the variables are concentrated in the middle limit; however, those variables close to the upper limit are relevant for their interpretation, since they show high means and complement this inference.

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Medium Limit	N	X	Min	Max	S
With a physical teacher you learn better	101	8.579	0.000	0.000	1.770
A love of music BEFORE entering the race	101	8.541	0.000	0.000	2.047
Graduate degree w/academic areas appropriate to the subject area	101	8.496	0.000	0.000	2.455
Now a fan of animation	101	8.460	0.000	0.000	2.333
Now a movie buff	101	8.436	0.000	0.000	2.189
Fondness for TV or Streaming series BEFORE entering the race.	101	8.426	0.000	0.000	1.969

Table 3 Univariate Mean Limit
Source: Own elaboration

In another order of ideas, it is observed that the graduation profile favors that students improve their interest in the audiovisual medium towards the end of their studies, with topics such as music, TV series or Streaming appearing in the "Upper Limit". Such reading is favored by the fact that variables such as taste with animation and cinema "now" - i.e. towards the end of their professional preparation - although not at the upper limit, appear very close to it, showing a particularly high mean. The improvement in these indicators is reinforced when observing how "interest in TV series or Streaming BEFORE entering the career", although it resulted with a high average, is nevertheless within the indicators of the "Middle Limit" and not within the "Upper Limit" contrary to those already mentioned.

At the same time, it is interesting that although it does not appear in the upper limit, the fact that a Higher Education Institution has adequate academic areas for the subjects appears among the priorities for choosing a postgraduate program.

Lower Limit

In the "Lower Limit" there are interesting findings related to the "Entry Profile Axis", "Person Axis" and the axes related to the postgraduate program itself ("Postgraduate Curricular Design", "Postgraduate IES Axis" and "Postgraduate Motivation Axis"):

In relation to the "Entry Profile" it is interesting to note that in relation to the complex variable "Previous Knowledge" the students consider, in retrospect, to have had low levels of competence in aspects related to art such as drawing and painting, but also in geometry.

Although this is surprising given the nature of the career, it is consistent with the common perception of the professors of the career, since these are aspects that are usually worked on as areas of opportunity generation after generation in the first year of training.

Lower Limit	N	X	Min	Max	S
Drawing skills BEFORE entering the career	101	6.109	0.000	10.000	3.258
Preference for Graduate Studies focused on Entrepreneurship and Digital Marketing	101	6.047	0.000	10.000	3.284
Basic knowledge in geometrical applications BEFORE entering the career.	101	5.955	0.000	10.000	2.654
Preference for a postgraduate degree where distance learning is provided	101	5.564	0.000	10.000	3.370
Study postgraduate to serve as an example in your family	101	5.515	0.000	10.000	3.709
The number of students per class or group influences the decision to study a postgraduate program.	101	5.467	0.000	10.000	3.582
With a distance teacher you learn better	101	5.358	0.000	10.000	3.016
Preference for Postgraduate studies focused on Architectural Visualization	101	5.010	0.000	10.000	3.442
In need of psychologist or psychiatrist care DURING the race	101	4.792	0.000	10.000	4.512
Knowledge of painting techniques BEFORE entering the career	101	4.641	0.000	10.000	3.421
Need to work DURING your career to contribute to your income	101	3.559	0.000	10.000	3.967
Feeling Religious or Close to a Religion	101	3.339	0.000	10.000	3.406
Need care from a psychologist or psychiatrist, BEFORE entering the career.	101	2.726	0.000	10.000	3.827

Table 4 Lower limit of the univariate
Source: Own elaboration

Regarding the "Person Axis", it is interesting that few students needed the care of a psychologist or psychiatrist before or during their studies. It is also significant that few were forced to work during their professional training in order to contribute to the family income, which speaks of families with a certain economic stability of those students who manage to finish their degree. Finally, it is interesting that most of the students who finish their degree do not seem to feel close to any religion.

Finally, in relation to aspects of the postgraduate degree itself, the student seems little interested in Postgraduates focused on Entrepreneurship and Digital Marketing, as well as Architectural Visualization. In a different category, the students are not very interested in distance learning, since the two attributes focused on measuring this point appear in the "Lower limit": "Preference for a postgraduate course with distance learning" and "With a distance teacher you learn better".

In turn, the number of students per class does not seem to be relevant when choosing a postgraduate course. Finally, it is relevant that "To study a postgraduate degree to serve as an example in your family" is the lowest motivation to study a master's or postgraduate degree, being the only one of these that appears in the "Lower limit": "To study a postgraduate degree to serve as an example in your family".

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Integrational (FACTORS)

The analysis used in this section dedicated to the integrational analysis was the Exploratory Factor Analysis (EFA), where there are no dependent and independent variables, likewise, this statistic examines all the variables as a whole, being currently one of the most widely used statistical techniques in the medical and social areas**.** (Méndez-Martínez & Rondón-Sepúlveda, 2012).

The statistic was applied to a total of 107 interval variables with a factor loading of .50, using Normalized Varimax Rotation.

The Varimax Rotation seeks to maximize the weights at the factor level; in other words, each variable is expected to be representative in only one of them, with the objective of minimizing to the maximum the number of variables within each factor (Méndez-Martínez & Rondón-Sepúlveda, 2012).

Below are the tables of the combinations grouped into factors with their reading.

Table 5 shows how the motivations for studying a postgraduate degree are strongly related both to pedagogical and didactic aspects of the postgraduate degree, and to the characteristics of the HEIs that offer it. This seems to denote a strong relationship between aspects such as the learning preferences of final-year students, highlighting their predilection for graduate programs that offer teachers with pedagogical and professional experience in their teaching area, where they work on practical evidence, whose facilities are adequate, spacious and with reliable Internet access; with the motivation per se to study a graduate program, all of the above seeming to be a motivation in itself that joins the variables listed in this Axis (motivation). At the same time, it is significant to observe how the highest values correspond to variables where the motivation to study a master's or postgraduate degree revolves mainly around professional growth, being better valued at work and learning to organize oneself combined with a high desire to stimulate creativity as a motivation.

N	Variable	Loading factorial	X
110	Postgraduate studies for the desire to move up the social ladder	0.649	6.764
110	Graduate studies to start a business	0.629	7.182
110	Study postgraduate to serve as an example in your family	0.568	5.518
110	Studying postgraduate studies to improve your job profile or CV	0.754	7.850
110	Postgraduate studies to achieve financial independence	0.729	8.267
110	Studying postgraduate studies for the desire to be better valued in a job	0.757	7.775
110	Postgraduate studies to build a network of professional contacts	0.762	7.273
110	Postgraduate studies for specialization in a professional area	0.749	8.323
110	Graduate study skills to improve Mexico	0.606	6.627
110	Postgraduate studies to discover new options for professional growth	0.773	7.818
110	Postgraduate studies to stimulate creativity	0.769	7.958
110	Graduate study for/ Getting used to achieving goals	0.753	7.350
110	Postgraduate studies to learn how to get organized	0.777	7.120
110	Postgraduate studies to polish social skills	0.710	7.077
110	Postgraduate studies to develop study habits	0.701	7.006
110	Reliable and fast Internet access influences the decision to study at a graduate level	0.573	7.262
110	Influences decision to pursue graduate studies in appropriate academic areas for the subject matter	0.699	8.528
110	Influences postgraduate decision to have equipped workshops for the subject.	0.550	8.686
110	Influences postgraduate studies Spacious university facilities	0.504	8.009
110	Influence of postgraduate studies on teachers w/teaching experience in their teaching field	0.538	8.876
110	Influence of postgraduate studies on teachers with pedagogical experience in the teaching field	0.584	8.354
110	Influence of studying a postgraduate program on teachers with varied didactic resources	0.603	8.275
110	Graduate study work on evidence focused on practical assignments	0.548	8.001

Table 5 Factor 1. Motivations and influences to study a postgraduate course
Source: Own elaboration

In Table 6 it is possible to observe how certain characteristics of the graduation profile related to mathematical competencies, facility for written expression and taste for cinema present strong relationships with the student's graduation profile, such as a strong taste for cinema at the time of graduation and the ability to carry out project planning and management.

Similarly, the taste for cinema in the last year of his career is related to the student as an organized person at school, which in some way could be interpreted as certain competencies of the transversal curriculum, such as self-management of his learning, organization of his activities, and responsibility in general, allow the student towards the end of his career to better enjoy cinema, improving his understanding of it.

N	Variable	Factorial loading	X
110	Basic knowledge in mathematical calculus BEFORE the race	0.718	6.590
110	Basic knowledge in physics BEFORE the race	0.691	6.251
110	Basic knowledge in geometry BEFORE the course of studies	0.584	5.914
110	Ease of written expression BEFORE entering the career	0.570	6.807
110	Movie buffs BEFORE entering the race	0.505	7.525
110	Perform project planning and management	0.580	7.205
110	NOW Movie buffs	0.591	8.391

Table 6 Factor 2. Entry Profile/Exit Profile
Source: Own elaboration

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Of particular interest is Table 7, which relates the characteristics of the graduate and entry profile with the learning preferences of students in their final year of the animation career, allowing a better understanding of the curricular, pedagogical and didactic characteristics that a postgraduate course aimed at them should have.

N	VARIABLE	Factorial loading	X
110	NOW fondness for TV series or in Streaming	0.551	8.719
110	Teaching rich in digital tools leads to better learning	0.508	8.471
110	Assertive and timely feedback enhances learning	0.718	9.004
110	Working with evidence focused on practical work is a better way of learning	0.724	8.749
110	Relating new topics to familiar ones helps us to learn better.	0.727	8.936
110	Relating topics of one subject to those of another is a better way of learning	0.504	8.189
110	Practice makes perfect	0.718	9.277
110	Practical examples are the best way to learn	0.610	9.036
110	Correcting your mistakes helps to facilitate learning	0.743	9.273
110	Prefer to have mistakes pointed out to correct them	0.647	9.262

Table 7 Factor 3. Learning Preferences
Source: Own elaboration

Table 8 relates in a very interesting way for this study some of the most important graduation competencies of the career (designing and building the scene, as well as Visual Effects and multimedia production) with characteristics related to the emotional stability of the student, such as communication within the family and the high negative relationship with the need for psychological care before entering school that the students mention.

N	VARIABLE	Factorial loading	X
110	Communication within the family	0.560	7.300
110	Attention of psychologist or psychiatrist, BEFORE the race	-0.549	2.657
110	Attention of psychologist or psychiatrist to DURING the race	-0.579	4.627

Table 8 Factor 5. Exit Competencies and Emotional Stability
Source: Own elaboration

Table 9 is of particular importance for this research, since it relates a certain group of learning preferences, allowing us to infer that the 9th semester IAEV student is a predominantly Visual/Verbal student. This aspect should be taken into account in the curricular design.

N	VARIABLE	Factorial loading	X
110	Listening is the best way to learn	0.542	7.364
110	Reading and taking notes is the best way to learn	0.611	7.307
110	Watching tutorials is the best way to learn	0.511	8.274

Table 9 Factor 6. Learning Preferences
Source: Own elaboration

On the other hand, with a view to a more comprehensive explanation regarding the entry profile, Table 10 allows inferring how IAEV students tend to cover aspects in their profile that allow a better performance in graphics and mass media, since they tend to be observers of their environment, a situation that is related to a recognition as a creative being and knowledge of drawing and painting BEFORE entering the career.

N	VARIABLE	Factorial loading	X
110	Drawing knowledge BEFORE the course	0.686	5.782
110	Technical knowledge of painting BEFORE the race	0.596	4.379
110	Creative BEFORE the race	0.520	7.817
110	Observer of the environment BEFORE the race	0.523	7.674

Table 10 Drawing and Painting Competencies in the Entry Profile Table 10 Factor 7

Table 11 highlights the variable "Focus on Video Games" as the main thematic and professional interest for the final year IAEV student when choosing a master's degree, which would allow a better approach in the curricular design of a probable graduate program.

N	VARIABLE	Factorial loading	X
110	Video game hobby BEFORE the race	0.617	7.865
110	NOW fondness for video games	0.696	8.005
110	Study a postgraduate degree focused on Video Game Design and Development	0.588	7.022

Table 11 Factor 8. Video games as a factor in the choice of postgraduate studies
Source: Own elaboration

Table 12 complements Tables 7 and 9 focused on "Learning Preferences", which allows us to complete the inference regarding the inclinations for certain forms of teaching-learning-evaluation, in this case the clear predilection for on-site and face-to-face teaching over distance learning and curiously in turn with the teaching vocation as one of the strong points to be considered in the curricular design of a postgraduate degree in animation.

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N	VARIABLE	Carga Factorial	X
110	Prefer a postgraduate course with face-to-face teaching	0.601	7.799
110	Postgraduate degree w/ subjects related to professional teaching practice	0.578	6.755
110	With a physical teacher you learn better	0.657	8.550

Table 12 Preference for face-to-face education
Source: Own elaboration

Correlations

Pearson's correlation coefficient is a test that measures the statistical relationship between two continuous variables. If the association between the items is not linear, then the coefficient is not represented adequately. The correlation coefficient can take a range of values from +1 to -1. A value of 0 indicates that there is no association between the two variables. A value greater than 0 indicates a positive association. That is, as the value of one variable increases, so does the value of the other. A value less than 0 indicates a negative association; that is, as the value of one variable increases, the value of the other decreases. To carry out Pearson's correlation it is necessary to fulfill the following:

The measurement scale should be an interval or ratio scale. The variables should be approximately distributed. The association should be linear. There should be no outliers in the data. Therefore, this statistic was applied to measure the magnitude of the relationship of the variables of the research phenomenon, in order to be able to use the relevance of the existing relationship between them. In the present investigation the level of significance of the correlation was α= 0.05, applied to 107 interval variables which resulted in the relationship of the following tables:

	Studying a postgraduate course to improve your job profile or CV
Studying for a Master's or postgraduate degree out of a desire to move up the social ladder	0.654359
Would you study a Master's or postgraduate degree to start a business?	0.630637
Studying a postgraduate degree to serve as a role model in the family	0.454997

Table 13 Studying a postgraduate degree to improve one's CV has an impact on one's social standing
Source: Own elaboration

Interestingly, when considering the motivations for studying a postgraduate degree, respondents consider that the improvement in the Curriculum Vitae will impact the improvement of the social ladder, improving the possibilities of starting a business and therefore will have a positive impact on the family as an example to follow.

	Studying a postgraduate degree out of a desire to be better valued in a job
Studying for a Master's or postgraduate degree out of a desire to move up the social ladder	0.711512
Would you study a Master's or postgraduate degree to start a business?	0.598503
Studying a postgraduate degree to serve as a role model in the family	0.531310
Studying a postgraduate course to improve your job profile or CV	0.808165
Studying a postgraduate degree out of a desire for financial independence	0.709519

Table 14 Studying for a postgraduate degree helps to be valued at work and improve the economic situation
Source: Own elaboration

The interpretation of Table 13 is reinforced when observing in Table 14 the strong correlation between studying a postgraduate degree to be better valued at work in order to improve one's CV, climb the social ladder, and finally achieve economic independence and be able to start a business, positively impacting the family by being an example to follow.

	Study a postgraduate course to Build a professional network
Person with values and ethics NOW	0.523388
Ability to adapt positively to change in your environment NOW.	0.498752
Studying for a Master's or postgraduate degree out of a desire to move up the social ladder	0.617933
Would you study a Master's or postgraduate degree to start a business?	0.671447
Studying a postgraduate degree to serve as a role model in the family	0.592227
Studying a postgraduate course to improve your job profile or CV	0.635492
Studying a postgraduate degree out of a desire for financial independence	0.656630
Studying a postgraduate degree out of a desire to be better valued in a job	0.695308

Table 15 Postgraduate studies, ethics, adaptability and professional contacts
Source: Own elaboration

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Table 15 relates the motivation to study a postgraduate degree wishing to build a network of professional contacts to improve one's CV and position at work with positive aspects of the respondent's personality such as being an ethical person, able to adapt to his/her environment.

	Studying a postgraduate degree out of a desire to discover new options for professional growth
Person with values and ethics NOW	0.493730
Studying for a Master's or postgraduate degree out of a desire to move up the social ladder	0.704938
Would you study a Master's or postgraduate degree to start a business?	0.641600
Studying a postgraduate degree to serve as a role model in the family	0.512936
Studying a postgraduate course to improve your job profile or CV	0.704717
Studying a postgraduate degree out of a desire for financial independence	0.686625
Studying a postgraduate degree out of a desire to be better valued in a job	0.779626
Study a postgraduate course to Build a professional network	0.769201
Studying a postgraduate degree to specialize in a professional area	0.742063
Studying a postgraduate degree out of a desire to Have skills to improve Mexico	0.594838

Table 16 Postgraduate studies for professional growth and specialization
Source: Own elaboration

Closing the motivations axis, it is relevant with a high degree of correlation, that students in the last year of IAEV consider that the study of a graduate degree will not only help them to grow professionally by specializing in a specific area, which they hope will result in the characteristics seen in the previous tables: better CV, improved employment status, economic independence and therefore the possibility of starting a business, but also impact on the respondent to be a factor of favorable change in turn for Mexico. This infers that the respondent not only thinks about his own well-being and that of his family, but also that of the nation (Table 16).

Table 17 is relevant because it links the interest in studying a postgraduate degree with academic areas appropriate for the subject being studied with motivational aspects already analyzed, such as improving one's CV, improving one's social standing and starting a business, with soft skills such as the desire to develop study habits, learn to organize oneself, polish social skills, stimulate creativity and achieve goals.

	Studying a postgraduate course with appropriate academic areas for the subject matter
Studying for a Master's or postgraduate degree out of a desire to move up the social ladder	0.546635
Would you study a Master's or postgraduate degree to start a business?	0.503254
Studying a postgraduate course to improve your job profile or CV	0.629705
Studying a postgraduate degree out of a desire for financial independence	0.670350
Studying a postgraduate degree out of a desire to be better valued in a job	0.668013
Study a postgraduate course to Build a professional network	0.613590
Studying a postgraduate degree to specialize in a professional area	0.708218
Studying a postgraduate degree out of a desire to Have skills to improve Mexico	0.502482
Studying a postgraduate degree out of a desire to discover new options for professional growth	0.708964
Studying a postgraduate degree out of a desire to Stimulate creativity	0.709963
Studying a postgraduate degree out of a desire to Achieve goals	0.698882
Studying a postgraduate program for the desire to learn how to get organized	0.622994
Studying a postgraduate degree for the desire to polish social skills	0.615374
Studying postgraduate studies for the desire to develop study habits	0.630032
Study a postgraduate course with reliable and fast Internet access	0.574914

Table 17 Graduate studies in HEIs with adequate academic areas improve soft skills
Source: Own elaboration

Comparative t-Student

The test known as t-Student is based on two premises: a) on the normality distribution, and b): on the samples being independent. This statistical tool makes it possible to compare samples, $N \leq 30$ and/or establishes the dissimilarity between sample means. Developed by William Sealy Gosset under the pseudonym "Student" (Student), it was initially designed with the objective of examining the differences between two independent and small samples having normal distribution and homogeneity in their variances (it should be noted that, in the original article, the author does not define what a large and/or small sample is). Gosset emphasizes the normality of both samples as crucial in the development of the test (Sánchez-Turcios, 2015).

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In other words, the t-Student is a statistical process that facilitates the assessment, appreciation or quantification of the significant difference that may occur between the means of two samples or groups in a variable; using a model of deductive or inferential statistics, which allows assuming or establishing whether the dependent variables disagree with each other, symbolizing through its t-value the number of units that separate the means of both samples. For the above described, the application of this exploratory statistic was carried out in order to know in the dependent variable of Gender those variables whose results are significant of the qualities that this study measured. The "t" comparison test for independent samples was performed with a significance value of p<=0.05, the analysis was made to a sample of 110 subjects of which 58 are men (Group 1) and 46 are women (Group 2), with 6 individuals identifying themselves as "OTHER". For practical purposes, it was decided to proceed with the comparison on the basis of the "male" and "female" genders, as these are the most significant, statistically speaking. The results of this exploration are shown in the following five tables, grouped according to the research axes explored where these variables appear.

Table 18, related to the "Person Axis", shows in the first place a significant increase in the number of fathers of men with a taste for reading novels, stories and literature in general. At the same time, this gender shows a greater tolerance to frustration in the last stretch of their careers compared to women. As a complement to this, it is very interesting that the female gender shows a greater tendency to visit a mental health professional, particularly before entering the career.

SIMPLE VARIABLES	T-test; Grouping: Student gender				
	Mas	Fem	Valor-T	df	p
At least one of the dads likes to read regularly.	6.931	5.413	2.457	102	0.016
Stress and Frustration Tolerance NOW	6.945	5.717	2.078	102	0.040
Attention of psychologist or psychiatrist, BEFORE the race	1.514	3.772	-3.239	102	0.002
Attention of psychologist or psychiatrist to DURING the race	3.569	5.652	-2.372	102	0.020

Table 18 Person Axis
Source: Own elaboration

In relation to the student profile (Table 19), the woman manifests having a set of competencies, skills and tastes usually at a better level than her male counterpart BEFORE entering the career: knowledge in drawing, painting, observers of the environment, fondness for reading, responsible and ethical person.

Some of these points are reinforced by the fact that women like to read before and towards the end of their studies in a considerably higher percentage than men (more than 3 percentage points). A similar result is observed - albeit with a lower percentage - with respect to women perceiving themselves as a person with ethics in both chronological moments: before and towards the end of their studies. A notorious -and expected- positive difference results in the fondness for video games on the part of male students before and towards the end of the course, reinforcing the perception of men as the gender that most enjoys this activity.

SIMPLE VARIABLES	T-test; Grouping: Student gender				
	Mas	Fem	Valor-T	df	p
Drawing knowledge BEFORE the course	5.052	6.739	-2.601	102	0.011
Knowledge of painting BEFORE the race	3.753	5.217	-2.230	102	0.028
Observer of the environment BEFORE the race	7.255	8.246	-2.280	102	0.025
Love of reading (novels, short stories, etc.) BEFORE the race	5.505	7.467	-3.549	102	0.001
Video game hobby BEFORE the race	9.217	5.989	6.528	102	0.000
Responsible person with your learning BEFORE the race.	7.159	8.054	-2.168	102	0.032
Person with values and ethics BEFORE the career	8.541	9.272	-2.922	102	0.004
NOW love to read -novels, stories, books-.	6.319	7.935	-3.108	102	0.002
NOW fondness for video games	8.957	6.696	4.214	102	0.000
NOW a person with values and ethics	8.621	9.337	-2.111	102	0.037

Table 19 Entry and exit profile
Source: Own elaboration

In relation to the motivation to study a postgraduate course (Table 20), significant differences between genders are observed, since women seem more focused on improving their work and professional possibilities by studying a postgraduate course, with averages above 8 compared to men whose averages are around 7 or less in aspects such as: improving their work profile, economic independence, being better valued at work, building a network of professional contacts, specialization in a professional area, studying a postgraduate course to become accustomed to achieving goals and learning to organize themselves better.

VARIABLE	T-test; Grouping: Student gender				
	Mas	Fem	Valor-T	df	p
Studying postgraduate studies to improve your job profile or CV	7.129	8.978	-3.381	102	0.001
Postgraduate studies to achieve financial independence	7.731	9.022	-2.414	102	0.018
Studying postgraduate studies for the desire to be better valued in a job	7.134	8.750	-2.805	102	0.006
Postgraduate studies to build a network of professional contacts	6.560	8.402	-3.435	102	0.001
Postgraduate studies for specialization in a professional area	7.819	9.152	-2.612	102	0.010
Graduate study for/ Getting used to achieving goals	6.871	8.239	-2.404	102	0.018
Postgraduate studies to learn how to get organized	6.534	8.033	-2.526	102	0.013

Table 20 Postgraduate Motivation Axis
Source: Own elaboration

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Regarding the characteristics that a Higher Education Institution should have, as a way of influencing the decision to study a postgraduate course, women once again seem to be the ones who think in a more practical way in relation to men, since the surveyed women show that the technological and pedagogical conditions of the HEI that offers a postgraduate course should be optimal to be attractive, in such a way that the "T-value" is usually higher than 2.5 percentage points in the average, giving particular importance to the Internet and the workshops equipped according to the subject (Table 21).

VARIABLE	Prueba T; Agrupamiento: Género alumno				
	Mas	Fem	Valor-T	df	p
Reliable and fast Internet access influences the decision to study at a graduate level	6.578	8.463	-3.384	102	0.001
Influences decision to pursue graduate studies in academic areas suitable for the subject matter	8.214	9.211	-2.390	102	0.019
Influences postgraduate decision to have equipped workshops in accordance with the subject matter.	8.164	9.391	-3.007	102	0.003
Influences postgraduate studies Spacious university facilities	7.621	8.609	-2.056	102	0.042
Influence of postgraduate studies on teachers w/professional experience in their teaching area	8.483	9.443	-2.385	102	0.019
Influence of postgraduate studies on teachers with pedagogical experience in their teaching field	7.912	9.065	-2.383	102	0.019

Table 21 IES Axis
Source: Own elaboration

Finally, when studying the thematic interests, as well as potential contents, pedagogical and didactic strategies in the curricular design of a postgraduate degree in animation, it is possible to observe a greater interest in women to study postgraduate degrees with a focus on teaching by competencies, giving particular importance to the school environment and whose subject matter is focused on Conceptual Art, Storyboarding, 2-D Animation and Cinematography. While the male gender prefers a postgraduate degree focused on Video Game Design and Development, which is in accordance with the results of the Entry and Exit Profile table.

In turn, the female gender manifests having a learning profile in animation mostly auditory-visual-social, which is reinforced in the statement regarding how reading and taking notes improves their learning (Visual/Verbal Students) as well as experiences and conversing in a group is better learned (Auditory/Verbal Students), where the differences between the measured variables are higher than 2 percentage points with respect to the male gender.

VARIABLE	T-test; Grouping: Student gender				
	Mas	Fem	Valor-T	df	p
Postgraduate studies w/ competency-based education	6.300	7.478	-2.055	102	0.042
University school environment on the decision to pursue graduate studies	7.388	8.543	-2.459	102	0.016
Study a postgraduate degree focused on Video Game Design and Development	7.843	6.076	2.860	102	0.005
Postgraduate Studies in Conceptual Art, Storyboarding and 2-D Animation	7.176	8.326	-2.119	102	0.036
Postgraduate studies focused on Cinematography	7.133	8.283	-2.235	102	0.028
Observing is the best way to learn	7.767	8.728	-2.306	102	0.023
Listening is the best way to learn	6.810	8.239	-2.783	102	0.006
Reading and taking notes is the best way to learn	6.953	7.967	-2.122	102	0.036
Sharing experiences and conversing in a group is a better way of learning	7.998	8.848	-2.218	102	0.029

Table 22 Axes Graduate Curricular Design/Learning Preferences
Source: Own elaboration

Discussion and Conclusions

The methods developed by Statistics constitute an important instrument for scientific study, so they can be applied in different fields of knowledge, among them the social sciences, one of them being educational research, where statistical techniques are particularly useful in positivist research and, specifically, in the data analysis phase, where it is possible to infer relationships between phenomena, populations and specific contexts (Gil-Flores, 2003). Such is the case of the present research, where we proceeded to the study of a social phenomenon, in this case trying to elucidate the profile of entry and exit of the student of the Animation and Visual Effects Engineering, as well as their learning preferences, with a view to the possible curricular design of an ex professo graduate program for the graduates of this professional career, Therefore, questions related to the possible motivations and inherent professional approach were also asked, through the use of a survey instrument, which gave numerical data collected on a reality or a context, obtaining products from its processing through the application of a systematic work method. The results revealed the following points:

Undergraduate Entry Profile: the IAEV applicant shows interest in TV or streaming series, as well as in music BEFORE entering the career, with a high average, but not enough to appear in the upper limit of the univariate. On the other hand, students consider, in retrospect, to have had low levels of proficiency in art-related aspects such as drawing and painting, but also in geometry.

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This, although surprising given the nature of the career, is consistent with the common perception of IAEV teachers, being aspects that are usually worked as areas of opportunity in the first year of training of each generation. In turn, and in another vein, it is interesting that students who reach the last cycle of training, declare not having needed attention from a psychologist or psychiatrist before or during the career, which could mean that those with such a need usually do not reach the end of their professional training.

Finally, towards a more comprehensive explanation regarding the entry profile, IAEV students contain elements in their profile that allow a better performance in graphics and mass media because they are usually observers of their environment, a situation that is related to a recognition as creative beings, as well as an interest in drawing and painting BEFORE entering the career -although as explained above, with a low average-.

Professional Graduation Profile: the graduation profile favors that students improve their interest in the audiovisual medium towards the end of their studies. It is significant that few students were forced to work during their professional training to contribute to the family income, which speaks of families with a certain economic stability in the students who manage to finish their degree. On the other hand, the taste for cinema in the last year of their career seems to be related to certain competencies of the transversal curriculum, such as self-management of their learning, organization of their activities, and responsibility in general, which would allow the student to better enjoy cinema, improving their understanding of it towards the end of their career. Some of the most important graduation competencies of the career (scene design and construction, as well as Visual Effects and multimedia production) seem to be related to characteristics linked to the emotional stability of the student, such as communication within the family and the high negative relationship with the need for psychological care before entering school mentioned by the students.

Pedagogical practices and learning preferences: IAEV students favor face-to-face teaching over distance learning. In turn, they prefer to learn by doing practicals and showing practical examples directly related to the subject and professional praxis. In this regard, they prefer the teacher to relate previous knowledge with new knowledge, which yields positive results regarding the application of transdisciplinarity as a pedagogical practice not only in the improvement of learning, but also as part of the curricular design for careers and postgraduate studies related to art.

On the other hand, a certain group of learning preferences ("Listening learns better", "Reading and taking notes learns better" and "Watching tutorials learns better") are related in a way that allows inferring that the 9th semester IAEV student is a predominantly Visual/Verbal student. This aspect should be taken into account in curriculum design.

Although there are useful differences between both genders: the female student manifests to have a learning profile in animation mostly auditory-visual-social, which is reinforced in the statement regarding how reading and taking notes improves their learning (Visual/Verbal students) as well as experiences and conversing in group one learns better (Auditory/Verbal students), where the differences between the measured variables are higher than 2 percentage points with respect to the male gender.

Evaluation: the IAEV student favors learning preferences tending to a punctual feedback from the teacher about their areas of opportunity.

Motivation to study a postgraduate degree: "To study a postgraduate degree to serve as an example in your family" is the lowest motivation to study a master's or postgraduate degree. While the highest values for the male gender correspond to variables where motivation revolves mainly around the improvement of the work profile or CV, professional growth, being better valued at work and learning to organize oneself combined with a high desire to stimulate creativity.

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For women, aspects such as "studying a postgraduate degree to achieve economic independence", "specializing in a professional area" and "building a network of professional contacts" seem to be the main motivations.

Higher Education Institutions: this practical approach is reflected in the decision to prefer a postgraduate program where the offering HEI has equipped workshops in accordance with the programmed subjects, as well as adequate academic areas for these subjects and reliable internet access. Interestingly, these points are of particular importance for women.

Postgraduate curricular design: the student seems little interested in Postgraduates focused on Entrepreneurship and Digital Marketing or Architectural Visualization. With the variable "Focus on Video Games" as the main thematic and professional interest -particularly for men-, and curiously with the teaching vocation as the strong points to consider in the curricular design of a postgraduate degree in animation. Women, on the other hand, favor a postgraduate degree with a focus on "Conceptual Art, Storyboarding, 2-D Animation and Cinematography". At the same time, women show particular interest in studying postgraduate programs focused on teaching by competencies.

Thus, the points mentioned above would allow in a second stage to methodically attend to the offer and design not only of postgraduate courses, but also of continuing education, such as specialization courses and diploma courses.

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Designing educational materials: a policy adrift?

Diseño de materiales educativos: ¿una política a la deriva?

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Abstract

The aim of this study is to carry out a state, national and international comparative analysis on the policies of the elaboration, design and use of didactic material. The methodology is qualitative, with a documentary analysis of the information that is handled on different platforms. The different international policies aim to benefit educational development at basic levels, their policies are aimed at eradicating illiteracy and that all children have access to education, promoting inclusion, equity and expansion of compulsory schooling; human rights and the rule of law are promoted in their spheres of competence, with emphasis on the right to education. Sharing successful experiences between countries, contributing to the design of educational models that enrich the debate on the future of education. Since Mexico is a diverse country, it needs to focus educational strategies by state. In relation to the elaboration, design and use of the didactic material, finding in the results, the presence of multiple documents, lines, policies on the use, design and elaboration of the didactic material, however, from all the information it is concluded that, The only person responsible for their selection and decision making in the way of use, design and preparation of the didactic material is the only thing that the institutions can control, giving them freedom in innovation: the teacher.

Didactical material, Elaboration, Design

Resumen

El objetivo de este estudio es realizar un análisis comparativo estatal, nacional e internacional sobre las políticas en la elaboración, diseño y uso del material didáctico. La metodología es cualitativa, con un análisis documental de la información que se maneja en diferentes plataformas de los organismos. Las diferentes políticas internacionales pretenden beneficiar el desarrollo educativo en los niveles básicos, sus políticas están dirigidas a la erradicación del analfabetismo y que todos los niños tengan acceso a la educación, promoviendo inclusión, equidad y ampliación de la escolaridad obligatoria; se promueven los derechos humanos y el estado de derecho en sus esferas de competencia, con ahínco en el derecho a la educación. Compartiendo experiencias de éxito entre países, contribuyendo al diseño de modelos educativos que enriquecen el debate sobre el futuro de la educación. Siendo México un país diverso necesita focalizar las estrategias educativas por estado. En lo relacionado a la elaboración, diseño y uso del material didáctico, encontrándose en los resultados, la presencia de múltiples documentos, líneas, políticas sobre el uso, diseño y elaboración del material didáctico, sin embargo, de toda la información se concluye que, el único responsable de su selección y toma de decisión en la forma de uso, diseño y elaboración del material didáctico es de lo único que pueden controlar las instituciones, brindándole libertad en innovación: el docente.

Material didáctico, Elaboración, Diseño

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Introduction

The different international policies aim to benefit educational development at basic levels, their policies are aimed at eradicating illiteracy and ensuring that all children have access to education, promoting inclusion, equity and the expansion of compulsory schooling; human rights and the rule of law are promoted in their spheres of competence, with emphasis on the right to education. Sharing successful experiences between countries, contributing to the design of educational models that enrich the debate on the future of education. As Mexico is a diverse country, it needs to focus educational strategies by state.

Public policies for developing educational materials.

Soto and Barraza (2016) mention that the birth of public policies in nation-states has to do with the need to improve the provision of public services to national societies; among these services are: tax services; various procedures, such as public safety; transport; health; education; supply; drinking water; infrastructure; communications; among other aspects. This indicates that, at present, governments have difficulties in drawing up efficient public agendas for their respective societies. These difficulties are endogenous and exogenous in nature.

Internal causes include: poor administration; political and regulatory issues; fiscal deficiencies and precarious finances.

External causes include: economic, political and social changes; liberalisation and globalisation of markets for goods and services; the political independence of economic and civil society; and the impact of information and communication technologies (ICT) (Castillo-German, 2012; Soto and Barraza, 2016).

All of this generates a diversity of problems that require a plurality of policies that, interrelated, configure networks that can respond to the problems or situations, applied in a joint or systemic way.

This series of problems and strategies that seek their solution is what will give rise to public policies. However, public policies do not work by themselves; they require a higher entity that, on the one hand, shapes them, coordinates them and is responsible for implementing them efficiently, transparently and with good results. This seems indisputable, although these results are not always found in social reality (Castillo- Alemán, 2012; Soto and Barraza, 2016).

Thus, they become the vehicle for the behavioural organisation of government, allowing the common problems of citizens to be incorporated into the state's agenda, so that they can be solved jointly. Furthermore, the United Nations Development Programme (UNDP) indicates that public policies are the set of actions and decisions aimed at solving the problems of communities and societies, such as economic, social, infrastructure, education, transport, among others (Castillo-Alemán, 2012; Soto and Barraza, 2016).

Public policies will be the ideal instrument to link private and governmental efforts in favour of collective goals (Vargas, Rivera, 2015, p. 7), affirms that public policies have an intimate relationship with management, since the public sphere is the context that guides the formation, definition, elaboration, implementation and evaluation of the referred public policies. Public policies thus become governmental instruments related to the regulations that restrict, prohibit or authorise the behaviour of social and political actors (Castillo-Alemán, 2012; Soto and Barraza, 2016).

In short, public policies "correspond to the action programme of the authority or the result of the activity of an authority vested with public power and governmental legitimacy". Public policies are strategies of a good government that are applied for certain purposes; responding to public problems thus typified by governments; however, not everything that governments do are public policies (Castillo-Alemán, 2012; Soto and Barraza, 2016).

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The characteristics of public policies also have an impact on the private sector: In the design of public policies, society, private organisations and governmental bodies at different levels can intervene jointly; public policies are universal when they are aimed at the entire population and are targeted public policies when they are aimed at solving a specific problem or at a particular social group; public policies are the point of convergence between public interests and private interests. It is also the point where government participation is unavoidable and unavoidable for the good outcome of public policies; public policies prevent the state from being the main protagonist of the economic process; the implementation of public policies should be understood as a set of actors, strategies, procedures, times, processes and actions that are concerned with ensuring the effective management of society, institutionalising conflict and cooperation; public policies allow the institutional scope of markets to be identified. They also provide a glimpse of governance in the behaviour of institutions; they must be selective and sequential. In other words, their application should aim to consolidate fiscal balance and avoid damaging the objectives of equity and competitiveness; they translate into the operation of programmes or projects; technological advances in information and communication have contributed to improving public services and increasing citizen participation (Polanco, 2011; Castillo- Alemán, 2012; Soto and Barraza, 2016; Murillo, 2017).

According to OECD (2010), Mexico and member countries have strategies in place to help education authorities strengthen their education systems. Focusing mainly on optimising public policies in leadership, teaching and school management in schools in order to improve results in basic education students, comparing the key factors in the various public policies of different school systems and adapting them to the reality and contexts. The result is 15 recommendations for a practical agenda to support schools, principals and teachers in implementing these tasks:

Among the recommendations proposed are:

Reinforce the importance of the role of teachers; determine clear standards of teacher practice; ensure high-quality initial teacher education (ITP) programmes; attract better candidates; professionalise teacher selection, recruitment, and evaluation; and link teachers and their professional development more directly to the needs of schools (Ferrari, Cachia and Punie, 2009; Ramirez and Valenzuela, 2017; Sanchez Mendiola and Escammilla de los Santos, 2018).

Redefine and support excellent school leadership and management; consolidate the role of school principals by setting clear standards: providing professional training, selection and recruitment, facilitating school autonomy with support structures, and ensuring social participation (Polanco, 2011; Castillo-Alemán, 2012; Soto and Barraza, 2016; Murillo, 2017).

Schools also need to have a stable source of funding that responds to their specific needs; conditions for successful education reform: countries can make exceptional improvements in educational outcomes in a relatively short period of time, ranging from a few years to a generation (Polanco, 2011; Castillo- Alemán, 2012; Soto and Barraza, 2016).

Delivering meaningful and comprehensive improvements in educational outcomes is a complex task that requires a multi-faceted strategy. At the core are public policies that focus on improving teaching and learning, including curriculum, teaching skills, leadership and assessment. At the same time, the design of public policy must take into account the context and the possibilities of implementation (Polanco, 2011; Castillo-Alemán, 2012; Soto and Barraza, 2016; López and Heredia, 2017; López and Heredia, 2017).

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Furthermore, the OECD (2010) notes that: the analysis of public policies in high-performing countries can guide governments with unclear objectives to have not only the support but also the understanding of society, attention to the recruitment, training and retention of individuals, both teachers and leaders with excellent performance, and review institutions and infrastructure that support educational improvement, as well as a professional and objective information system of results and accountability and reports that support the government's objectives; finally, a focus on the work of each school where the learning-teaching process takes place (Ferrari, Cachia and Punie, 2009; Ramírez and Valenzuela, 2017; Sánchez Mendiola and Escammilla de los Santos, 2018).

For this reason, it is up to each country to undertake each of these points; therefore, improvements in an entire education system only occur if there is consistent political support and continuous leadership over a certain period of time, which implies years of effort and work, especially reflection and persistence (UN, 2022).

For this reason, towards educational reform in Mexico, improving the quality of education is a political and social priority in Mexico, especially in recent years, due to high rates of poverty, strong inequality and rising crime. Despite educational improvement and an increasingly significant direction in education policy in recent years, a high proportion of young people still do not complete upper secondary education and student performance is not sufficient to provide the skills Mexico needs: half of 15-year-olds did not reach PISA basic level 2, compared to an OECD average of 19.2% in 2006. The school day is short, with insufficient effective teaching time; and in countless schools, teaching and leadership are of low quality, and support is weak (UN, 2022).

Structural challenges persist: capacity failure, unclear division of responsibilities in the decentralised system, and structural circumstances and processes do not facilitate putting schools at the centre of education policy (Ferrari, Cachia and Punie, 2009; Ramirez and Valenzuela, 2017; Sanchez Mendiola and Escammilla de los Santos, 2018).

Schools operate with scarce resources that need to be better distributed among them. This demands greater capacity and the creation of institutionalised structures to ensure dialogue and consensus building, so Mexico needs to develop a long-term education strategy to certify a higher overall level of skills and knowledge, which will provide economic growth and better living conditions for all Mexicans.

One of the first necessary conditions is to establish a small number of clear, measurable and high-priority objectives, adequate to improve student performance, decrease dropout rates at low levels, ensure "relevant graduation" and reduce inequalities within the education system. The first key point of the reform is the need to put Mexican schools and students at the centre of education policy design.Furthermore, the OECD (2010) notes that: the analysis of public policies in high-performing countries can guide governments with unclear objectives to have not only the support but also the understanding of society, attention to the recruitment, training and retention of individuals, both teachers and leaders with excellent performance, and review institutions and infrastructure that support educational improvement, as well as a professional and objective information system of results and accountability and reports that support the government's objectives; finally, a focus on the work of each school where the learning-teaching process takes place (Ferrari, Cachia and Punie, 2009; Ramírez and Valenzuela, 2017; Sánchez Mendiola and Escammilla de los Santos, 2018).

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Improving Mexican schools will require reflection on the governance system, as well as the role of school leaders and teachers, to enable a focus on supporting all children and young people to achieve their greatest learning potential.

Furthermore, the OECD (2010) indicates that to ensure progress in the design and implementation of public policy, it can be helpful to: provide spaces for dialogue and communication between all actors; ensure that actors and public policies are in order; monitor the structures that will propose reforms; match the following elements:

- The focus on education.
- Training, development and support for the educator workforce.
- Public policy decisions, and resources.

Stimulating the development of national, regional and local capacity building that supports not only better management of schools, but how to continue to build reliable sources of information for evaluation and improvement.

On the other hand, the same OECD (2010) indicates that: it is necessary to take ownership of the recommendations in order to adapt them, in conjunction with all actors, and with the benefit of creating a culture of professionalisation interested in consistent teaching. This is achieved through learning from different aspects of building the recommendations in different states, learning from each other. The recommendations are intertwined with the Sector Programmes and the Alliance for Quality, as well as the goals of the 20-30 agenda, for example, creating unity and partnership in driving and enabling change (Dávila and Luis, 2014).

Mexico, the 14th largest economy in the world (2009), faces significant challenges in education. Despite significant progress in recent decades in terms of access, improvements in completion rates at basic education levels and the development of learning assessments, considerable challenges remain.

Mexico invests a high share of the public budget in education (about 22%, the highest among OECD countries). Optimising the quality of education services, increasing levels of educational attainment and minimising dropout rates are priority issues (Dávila and Luis, 2014).

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Equally important, Mexico must ensure that all children and youth, including those from disadvantaged socio-economic backgrounds and indigenous families, have equal educational opportunities. In order to address these issues, the Mexican government established priorities for education reforms in its Education Sector Programme 2007-2012.

In order to monitor progress towards achieving its objectives, the Ministry of Public Education (SEP) established improvement indicators for student learning as measured by the National Assessment of Educational Achievement in Schools (ENLACE) and the OECD's Programme for International Student Assessment (PISA).

Other key indicators relate to teacher professional development, school decision-making, equity in educational opportunities, and content and curriculum reforms (Dávila and Luis, 2014).

To promote the education reform process, the Mexican government established the Alliance for Quality Education with the National Union of Education Workers (SNTE) in 2008. In this context, the SEP and the OECD established in 2008 the Agreement to Improve the Quality of Education in Mexican Schools. The purpose of the agreement was to establish not only what policy changes should be considered in Mexico, but also how to design and implement policy reforms effectively, building on ongoing initiatives as well as local conditions, constraints and opportunities (Dávila and Luis, 2014; Dirección General de Materiales Educativos, 2017).

One of the components of this agreement deals with the development of appropriate policies and practices to assess the quality of schools and teachers and to link results with incentives to achieve improvement processes. These work streams were led by the OECD Advisory Council on Teacher Evaluation Policies and Incentives in Mexico, which is composed of international experts. The main results of the co-operation agreement between SEP and the OECD are presented below:

Improving Schools: Strategies for Action in Mexico (OECD, 2010), as part of this effort, material concerning value-added models was also renewed and translated.

According to UN Mexico and the plans it contains there is an agenda 2030 on sustainable development which I mention below, and it is nothing more than the generalised plans of the UN to UN Mexico to follow up (Dávila and Luis, 2014; UN, 2022).

Sustainable Development Goals (SDGs)

The SDGs are appropriate devices that will engage people and their leaders together, to participate in the search for social consensus and to narrow the gaps.

In 2015, more than 150 world leaders attended the United Nations Sustainable Development Summit in New York to adopt the Sustainable Development Agenda. This includes the 17 Sustainable Development Goals (SDGs) which aim to end poverty, fight inequality and injustice, and tackle climate change with no one left behind by 2030.

This new development framework provides an opportunity for the United Nations System, globally and in Mexico, to focus cooperation and programming, to continue to defend and sow the seeds of inclusion and equity in a framework of rights, to build more citizenship for Mexicans in this country.

Mexico and the 2030 Agenda

Mexico participated actively in the definition of the Agenda. The country was one of the most active in the consultation forums, participating and leading the negotiation process. It not only presented specific proposals to incorporate the principles of equality, social and economic inclusion, and promoted universality, sustainability and human rights as the guiding principles of the 2030 Agenda. It also advocated the adoption of a multidimensional approach to poverty that, in addition to considering people's income, would take into account their effective access to other basic rights such as food, education, health, social security and basic housing services.

Mexico has maintained its participation in the implementation of the 2030 Agenda, some of the advances are:

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- Mexico was one of the two volunteer countries in the region to present progress on the SDGs at the High Level Political Forum on Sustainable Development.

- Installation of the Specialised Technical Committee on Sustainable Development (Presidency of the Republic-INEGI), with the participation of the Federal Public Administration agencies.

- The Senate of the Republic set up the Working Group on the 2030 Agenda, which will provide follow-up and support from the legislative branch for the fulfilment of the SDGs.

- Development of the SDG implementation plan by the Presidency of the Republic and AMEXCID with UNDP support.

- Installation of the National Council of the 2030 Agenda for Sustainable Development.

Figure 1
Source: www.un.org

The 17 Sustainable Development Goals, and their 169 targets, address the structural causes of poverty, combat inequalities and create opportunities to improve people's quality of life within a sustainable development framework. It serves as a launching pad for action by the international community, governments, as well as civil society organisations, academia and the private sector, to address the three interconnected elements of sustainable development: economic growth, social inclusion and environmental sustainability.

In Mexico, the public education policy on the design, use and development of teaching and learning materials argues that the educational model for free education is based on the development of education for freedom and creativity, by improving educational quality and equity. The materials policy has the global vision that learning is a process where students will build disciplinary, interdisciplinary and practical knowledge, cognitive, metacognitive, physical and practical skills, attitudes of curiosity, proactivity and global mindset, and the development of values that enable them to mobilise knowledge as knowledge, skills, attitudes and values in themselves and in their relationship with those around them, creating conducive learning environments (IDEO, 2012; Dirección General de Materiales Educativos, 2017).

Therefore, although the free textbook has been important as a material that has guaranteed, for six decades, frequent national teaching for basic education students, it has not been the only material; SEP has developed different programmes to provide schools and students with different and varied didactic materials such as: reading and corner books, audiovisual material, digital educational material, as well as computer devices and virtual platforms. These are designed to supplement the free textbook.

Methodology to be developed

The methodology is qualitative, with a documentary analysis of the information that is handled in the different digital platforms on the Internet. The website of the Ministry of Public Education, federal and state control, as well as the websites of the UN, UNESCO, UNICEF, WHO, OECD, IMF and WB, among others, were analysed.

Results

It was found that the public policies of international organisations have an impact on the country's educational public policies. The main characteristics detected in the Ministries of Education of the States and the federal control and international organisations are shown below.

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The results are by agency and State.

WORLD ORGANIZATION		STATE OF THE REPUBLIC AND SEP FEDERAL CONTROL	
ONU UNICEF UNESCO BM OCDE BID FMI	Young people are the future of the world. Education for all. Equality. Equity. Free materials. education is a human right for all. It strengthens education systems worldwide and responds to global challenges through education, with gender equality as an underlying principle. Right to education Digital learning. Free material Virtual material Videos eLibrary Ilbrary		Contribute with the activities and powers conferred so that citizens have access to information related to issues related to the Right to Education enshrined in Article 3 of the Political Constitution of the United Mexican States and its regulations. Organically link all programmes oriented to the attention of the population in conditions of vulnerability. Optimise and make good use of public resources, and allocate greater resources for the improvement of public education, with emphasis on school infrastructure. SCHOLARSHIPS Courses Workshops General Directorate of Educational Materials (SEP) Contribute with the activities and powers conferred so that citizens have access to information related to issues related to the Right to Education enshrined in Article 3 of the Political Constitution of the United Mexican States and its regulations. Organically link all programmes oriented to the attention of the population in conditions of vulnerability. Optimise and make good use of public resources, and allocate greater resources for the improvement of education. public, with an emphasis on school infrastructure. SCHOLARSHIPS Courses Workshops General Directorate of Educational Materials (SEP)

Table 1

The United Nations (UN) Cyberschoolbus, established in 1996, is the online educational mechanism of the Global Teaching and Learning Project, whose function is to provide educational materials on global issues and the UN to an international educational community. It develops high quality educational activities and materials designed for use in primary, intermediate and secondary education and teacher training.

The United Nations Children's Fund (UNICEF) is a New York-based agency of the United Nations that provides humanitarian and development assistance to children and mothers in developing countries. UNICEF Mexico tends to implement projects and support public policies to stimulate the access of children and adolescents to inclusive and quality education, and to eliminate and/or minimize school dropout.

UNESCO is created under the elements of equality of educational opportunities, non-restriction in the pursuit of truth and the free exchange of ideas and knowledge. While its central purpose is to contribute to peace and security by initiating collaboration among nations through education, science and culture.

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This makes it possible to assert that UNESCO is one of the most important international organisations, which has managed to sustain in the current context of economic globalisation, a social and humanistic perspective of education, being different from other international agencies that manifest fundamentally an economic perspective; it is also in charge of the execution of prospective studies; as advances, transfers and exchange of knowledge; develops criteria and scenarios of action; technical and expert cooperation, and expert exchange of information. Exclusively, it issues recommendations to member countries, without granting financial resources, unless they are from specific projects created in the same institution, as is the case of the UNESCO Chairs.

Supplementary materials include books, newspapers, information booklets and other printed materials in the mother tongue and in languages of instruction that reflect local customs and concerns. They enhance teaching, engage learners in multidimensional learning, deploy learners' abilities to apply their knowledge (Elliott and Corrie, 2015) and are therefore essential for literacy outcomes (Read, 2015).

The WB (World Bank) symbolises one of the main international funding agencies for education.

The origins of what is now known as the World Bank date back to a conference held in July 1944, convened by the leaders of England and the United States (Churchill and Roosevelt). Some of the main axes of the WB lie in the areas of primary, secondary, technical, higher, women's and minority ethnic education: access, equity, internal efficiency, quality, financing, administration, results and internationalisation, as well as the concern for education in a context of globalisation and economic competitiveness.

Danger and Promise (PP), UNESCO and the World Bank seek to answer the following questions: What is the role of higher education (HE) in supporting and fostering economic and social development; what are the key obstacles facing HE in developing countries; and how best to overcome these obstacles? And how can these obstacles best be overcome?

The OECD sets out its core activities to which the organisation is committed, through the study and enunciation of policies in a wide range of economic and social spheres. According to the OECD for Mexico and Latin America, some of the organisation's points of interest in relation to higher education focus on: a) The transition between higher education and employment, proposing two fundamental aspects: the social and productive integration of individuals, as well as the flexibility of the higher education package to better adapt it to productive needs. b) The resolution of the difficulties related to upper secondary education, establishing it in the real, effective and qualitative knowledge, considering that the solution of this problem will allow the success of the programmes in higher education. c) The reduction of the economic resources used in higher education, proposing at that time the variation of the sources of financing at the tertiary level (Georgina Sánchez, 1998).

The Washington-based Inter-American Development Bank (IDB) was created in 1959 with the aim of accelerating the process of economic and social development of its member countries in Latin America and the Caribbean (IDB, 1994). Thus the aims towards higher education are to assist in the development of human resources, to provide universal access to education, and to strengthen planning, organisation, administration and teaching methods, as well as to support reforms of national education systems.

Finally, the International Monetary Fund (IMF) is a multilateral lending organisation, where its role is focused on financing and promoting market reforms with a presence in Latin America and the Caribbean, guaranteeing and stabilising the political and economic conditions of rent extraction for a sector of US banking finance capital, thus ensuring greater inequality in income distribution, channelling the opening of new financial capital markets through reforms, suffering in the public sector in education, health, income distribution and the general conditions of society.

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Conclusions

In relation to the elaboration, design and use of didactic material, the results show the presence of multiple documents, lines, policies on the use, design and elaboration of didactic material, however, from all the information it is concluded that the only person responsible for the selection and decision making in the form of use, design and elaboration of didactic material is the only one that the institutions can control, giving him/her freedom in innovation: the teacher.

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Abstract (In English, 150-200 words)

Objectives
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Keywords (In English)

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* Correspondence to Author (example@example.org)
† Researcher contributing as first author.

Introduction

Text in Times New Roman No.12, single space.

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

[Title No.12 in Times New Roman, single spaced and bold]

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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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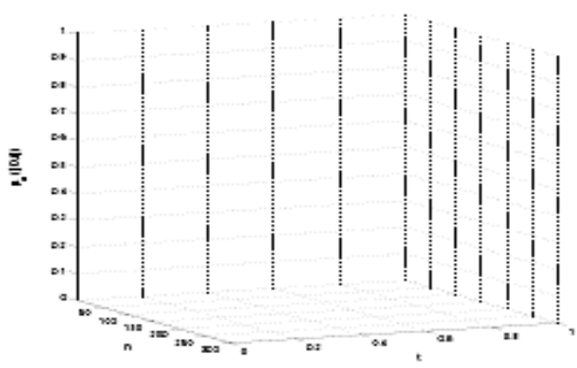

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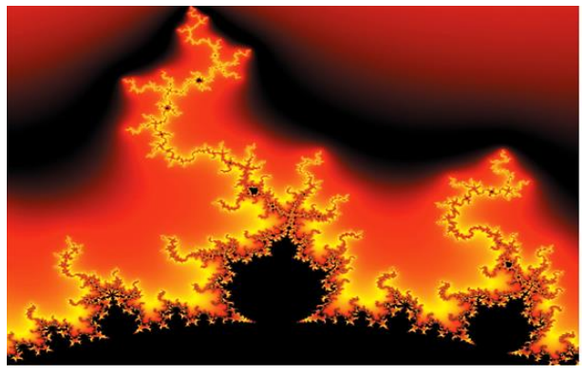

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For the use of equations, noted as follows:

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

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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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Use APA system. Should not be numbered, nor with bullets, however if necessary numbering will be because reference or mention is made somewhere in the Article.

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Each article must submit your dates into a Word document (.docx):

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Article sections, for example:

1. Introduction
2. Description of the method
3. Analysis from the regression demand curve
4. Results
5. Thanks
6. Conclusions
7. References

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