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Technological tools in the development of skills and abilities in the subject of Entrepreneurship and Management

Herramientas tecnológicas en el desarrollo de habilidades y destrezas en la asignatura de Emprendimiento y Gestión

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Abstract

In Ecuador, the subject of entrepreneurship and management is taught to students in the third year of the unified general baccalaureate. However, this subject is taught following a traditional line of text management and expositions that do not allow the student to approach a technology-based education. This study explored how technological tools can be used to improve the skills and abilities of high school students in the Tulcán Educational Unit, Ecuador. The research was carried out under a mixed approach with a descriptive, bibliographic and field scope. Survey and interview techniques were applied to students and teachers of the Institution. Based on the results, a virtual classroom proposal was designed in Moodle 4.1 to awaken the entrepreneurial spirit of students regarding the creation of web pages, logo design, creation of digital advertising, among others. This study concludes that the virtual classroom proposal contributes to improve the teaching-learning process in the subject of Entrepreneurship and Management, adapting to the needs of the students.

Keywords: Educational entrepreneurship; technological tools; digital world; virtual classroom; Google Sites.

Resumen

En Ecuador, la asignatura de emprendimiento y gestión se imparte a los alumnos de tercero año de bachillerato general unificado. Sin embargo, esta asignatura se imparte siguiendo una línea tradicional de manejo de textos y exposiciones que no permiten que el estudiante se acerque a una educación basado en tecnología. En este estudio se exploró, cómo las herramientas tecnológicas pueden ser utilizadas para mejorar las habilidades y destrezas de estudiantes de Bachillerato en la Unidad Educativa Tulcán, Ecuador. La investigación se ejecutó bajo un enfoque mixto con alcance descriptivo, bibliográfico y de campo. Se aplicaron las técnicas de encuesta y entrevista a estudiantes y docentes de la Institución. A partir de los resultados se diseñó una propuesta de aula virtual en Moodle 4.1 para despertar el espíritu emprendedor de los estudiantes respecto a creación de páginas web, diseño de logotipos, creación de publicidades digitales, entre otros. Este estudio concluye que la propuesta de aula virtual contribuye a mejorar el proceso enseñanza-aprendizaje en la asignatura de Emprendimiento y Gestión acoplándose a las necesidades de los estudiantes.

Palabras clave: Emprendimiento educativo; herramientas tecnológicas; mundo digital; aula virtual; Google Sites

Introduction

The digital world and its influence on education has led to changes in learning and teaching objectives, giving priority to a more active participation of the student. Educational institutions with this vision seek to improve educational quality every time, seeking to continuously make adjustments in their curriculum and teaching processes, based on the use of technological tools (Khvilon & Patru, 2002)..

In this sense, several researches have been conducted at regional and national level in relation to technological tools where researchers have proposed several (Google Meet, Google Classroom Forms, YouTube), among others, to enhance learning in current education (Cruz, 2018; Meza, 2020; Zamoram 2022; Cahuascanco, 2022). Molinero and Chávez (2019), emphasize that technology is mostly used by students at the university level and specify how they contribute to learning in university careers. In contrast, the teaching staff of educational institutions still needs to reinforce knowledge in educational technology platforms for the teaching process, determining that these should be implemented progressively to provide learning according to the current situation of students.

During the last decade, the Ecuadorian government has recognized the need to promote entrepreneurship in students, betting on the increase of productive activity by incorporating the subject of "Entrepreneurship and Management" into the General Unified Baccalaureate (BGU) program, according to the Official Registry No. 275. (Merino, 2022). In this subject, the application and practice of technological tools are

fundamental, since they encourage students to find innovative and creative ideas, motivating their entrepreneurial spirit.

Since it is a completely new discipline, research is required to identify appropriate teaching methods, relying on technological tools and Information and Communication Technologies (ICT). Navarro et al. (2022) point out that ICTs are a fundamental tool for learning and contribute to capture the student's attention, motivating him to innovate and above all stimulating him to create his own knowledge.

The implementation of the subject of Entrepreneurship and Management in the Ecuadorian Baccalaureate guarantees the application of national guidelines established by current laws and regulations and asks students if they have the competencies and skills to create, build, innovate, take risks, plan, execute and evaluate educational projects. (Ministry of Education, 2021). In this sense, one of the most relevant aspects of learning to be an entrepreneur is to define the product or service that one wants to offer, this is how the lack of knowledge of marketing strategies to expose and establish the market variables relevant to a product becomes decisive when it comes to sustaining a business.

Therefore, efforts must be made to address the skills and behaviors that are part of being an entrepreneur, in order to develop the classroom praxis and achieve the development of the skills foreseen in this subject. According to Pherez et al. (2018), they refer to skills as the ability to perform activities with certain quality and efficiency, applying the person's knowledge and attitudes. To this end, it is intended that students take on the challenge of practicing entrepreneurial attitudes by addressing individual, social and economic dimensions.

The objective of this study is to analyze the contribution of technological tools in the subject of Entrepreneurship and Management, based on the need to motivate students to develop the entrepreneurial spirit. For this reason, it is feasible to carry out the study especially to improve the teaching methodology that is focused on the correct formation of the student and his continuous progress in society.

Materials and methods

This research was based on a descriptive-propositional research design that combines elements of descriptive research, which seeks to analyze the current situation of tara production in Chachapoyas, and propositional research, which aims to propose sustainable production strategies. The study is cross-sectional, as the primary data correspond to the study period 2023.

The study population consisted of farmers dedicated to the cultivation of tara in the province of Chachapoyas. Given the small population (50 farmers), it was decided to consider the total population within the study. Data collection will be carried out using a combination of qualitative and quantitative methods: Structured surveys were conducted with farmers in Chachapoyas. These interviews will provide a deeper understanding of the current situation and possible strategies for sustainable

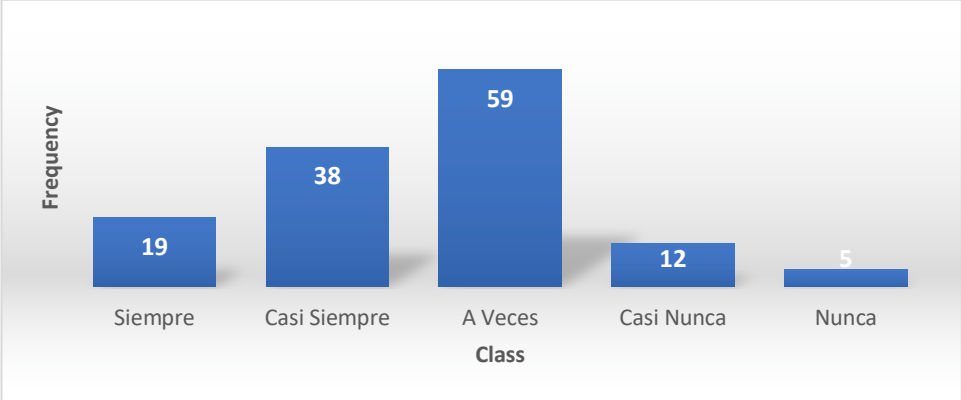
production; in addition, various proposals collected from bibliographic sources were studied qualitatively and then filtered according to their level of adaptability to the context of the study population.

Based on the results of the descriptive research and in consultation with the available literature, sustainable production strategies were proposed. These strategies will be designed to address the identified challenges and promote sustainable agricultural practices in tara production in Chachapoyas. Informed consent was obtained from all participants in the interviews and surveys. Confidentiality of the data collected was guaranteed, and ethical standards and procedures established by the research institution were followed.

Results

Below are the results of the surveys conducted to 130 students in third year of high school of the Tulcán Educational Unit in relation to technological tools and their use In Figure 1 it can be observed the distribution of frequencies is similar to the normal distribution, with a mean (μ) of 2.59 and a standard deviation (**σ**) of 0.97, where the answers tend to consolidate in 3 to "Sometimes", suggesting that the use of technological tools is not frequent from a general perspective of students in the subject of entrepreneurship and management. For Reyes and Avalos (2018), in their research also determines that in the teaching process technology is not used in entrepreneurship training and in high school students concluding that this causes little interest and motivation in the subject.

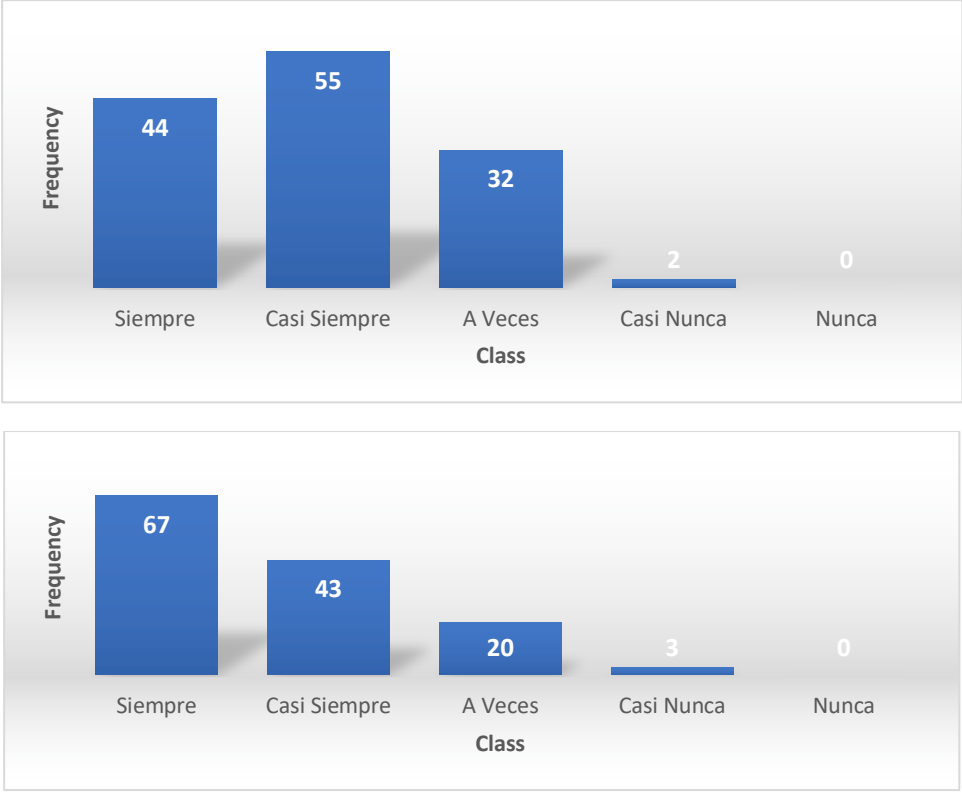
Figure 1. Frequency of use of technological tools



In Figure 2a it can be observed that, the placement of the frequencies is skewed to the right (positive bias) with a mean (μ) of 1.94 and a standard deviation (**σ**) of 0.795, where the answers tend to consolidate in 2 to "Almost Always", suggesting that students in a general way consider necessary the frequent use of ICT for training in the subject of entrepreneurship and management. In Figure 2b, the distribution of frequencies is skewed to the right (positive skew) with a mean (μ) of 1.69 and a standard deviation (**σ**) of 0.809, where the responses tend to consolidate in 1 to "Always", suggesting that

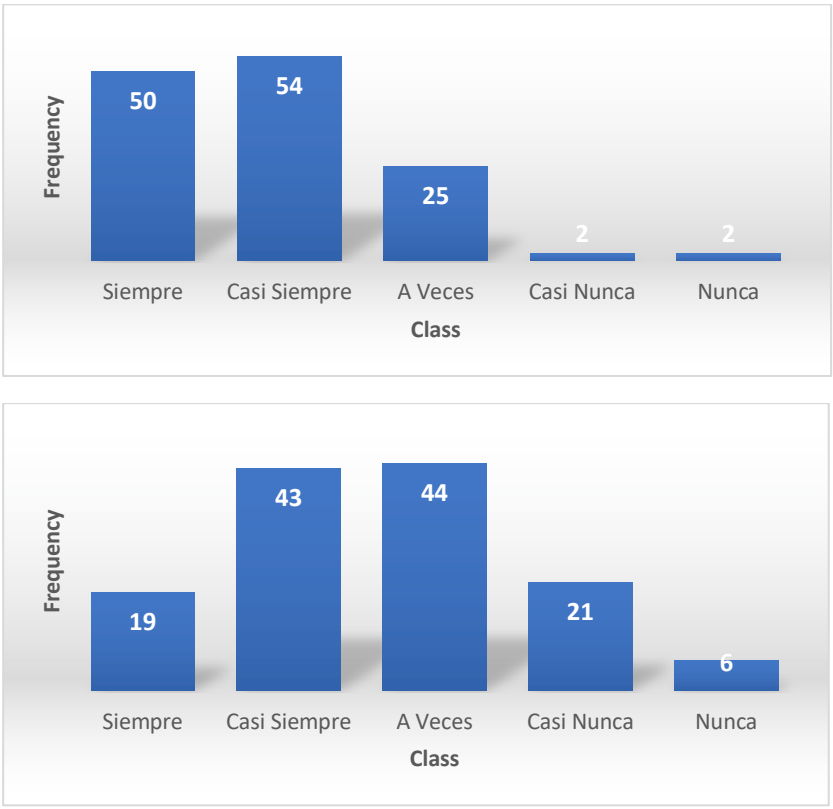
students generally consider that the frequent use of technological tools gives an advantage in the search for new markets.

Figure 2. (a) Use of technological tools for the development of the Entrepreneurship and Management subject. (b) Technology providing advantages for the search for new markets.



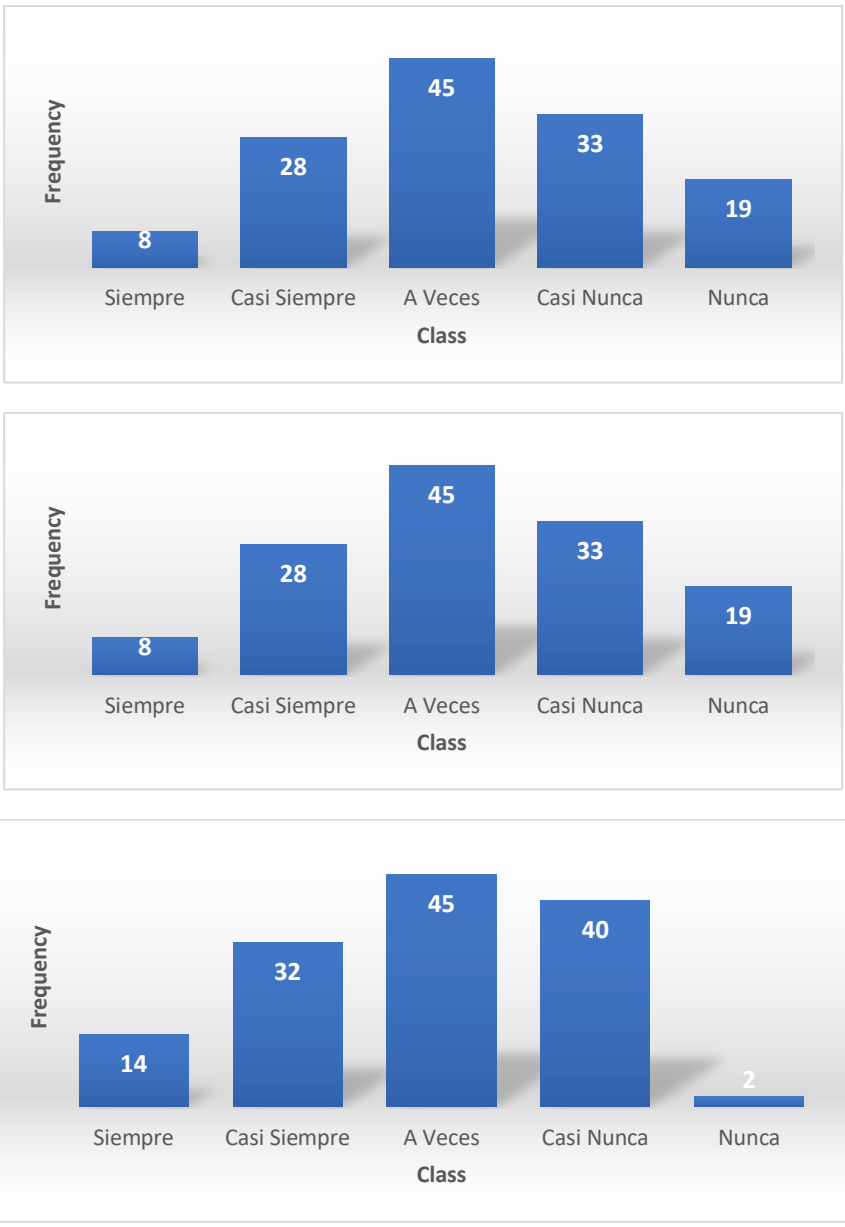
As can be seen in Figure 3a, on this occasion the frequency distribution presented a positive bias with a mean (μ) of 1.89 and a standard deviation (**σ**) of 0.867, where the answers tend to consolidate in 2 to "Almost always", which suggests that, in general, the students consider that they agree with the automation of processes in an enterprise through technology. In the frequency of Figure 3b, it can be considered that, the highest frequency percentages correspond in 1 to "Always" with 33.08% and to "Almost always" with 31.58%, presenting a tendency to the use of Social Networks by approximately two thirds of the participants, likewise, 24.08% use it "Sometimes", which suggests that, there is a general interest in the use of this technological tool. However, the percentage frequencies present a standard deviation (**σ**) of 1.058 showing a slight decrease in the consolidation of the responses.

Figure 3. (a) Automation of processes in an enterprise through technology. (b) Frequency of use of Virtual Classrooms.



In Figure 4a, it can be seen that the highest frequencies belong in 3 to "Sometimes" with 33.83% and in 2 to "Almost never" with 24.81%, where it is visualized that the use of applications to create webs is not very common, likewise, 21.05% use it in 2 to "Almost always" being the third predominant percentage. This suggests an infrequent knowledge or interest in the use of this technological tool. However, the standard deviation (**σ**) is 1.113 which suggests a decrease in the consolidation of responses, i.e. there is deviation with respect to the mean of 3.20. As can be seen in Figure 4b, the highest percentages correspond in 3 to "Sometimes" with 33.83% and in 4 to "Almost never" with 30.08%, where it is observed that the use of forms is uncommon, likewise, 24.06% use it in 2 to "Almost always" being the third predominant percentage. This suggests, in general terms, an infrequent knowledge or interest in the use of this technological tool. However, the standard deviation (**σ**) is 1.008, showing a decrease in the consolidation of responses, i.e. there is a deviation with respect to the mean of 2.88.

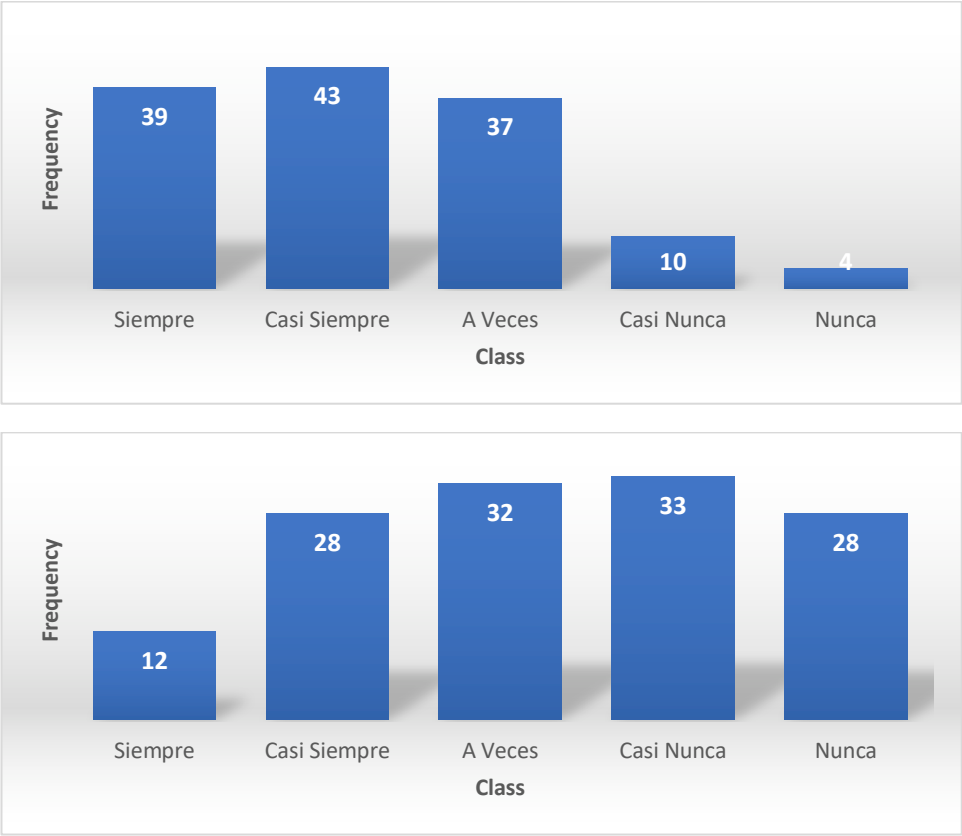
Figure 4. (a) Frequency of use of applications to create Webs. (b) Frequency of use to create digital forms.



As can be seen in Figure 5a, the highest frequency percentages correspond in 3 to "Almost always" with 32.33% and in 1 to "Always" with 29.32%, where it is observed that the Advertising Design is common, likewise, 27.82% use it in 3 to "Sometimes" being the third predominant percentage. This suggests that there is a frequent knowledge or interest in the use of these technological tools. However, the standard deviation (σ) is 1.049 showing a decrease in the consolidation of responses, i.e. there is a deviation from the mean of 2.23. It can be seen in Figure 5b that the highest percentages obtained correspond in 4 to "Almost never" with 24.81% and in 3 to

"Sometimes" with 24.06%, where it is observed that Web analytics is not common, likewise, 21.05% use it in 5 to "Never" being the third predominant percentage, together with 2 to "Almost always". This suggests that there is an infrequent knowledge or interest in the use of these technologies. However, the standard deviation (**σ**) is 1.263, which suggests a decrease in the consolidation of responses, i.e. there is a deviation from the mean of 3.28.

Figure 5. (a) Frequency of use of technological tools for an Advertising Design. (b) Frequency of use of Web Analytics.



Surveys on entrepreneurship and management skills and abilities

The results of the surveys to the same students in relation to skills and abilities in entrepreneurship and management are shown below. Figure 6 shows that the frequencies are skewed to the right (positive bias) with a mean (μ) of 1.71 and a standard deviation (**σ**) of 0.886, where it is observed that the answers tend to consolidate in 1 to "Always". This suggests that, students generally consider that teaching through new technologies will be able to improve their entrepreneurial skills and abilities.

Figure 6. Teaching through new technologies improves skills and abilities.

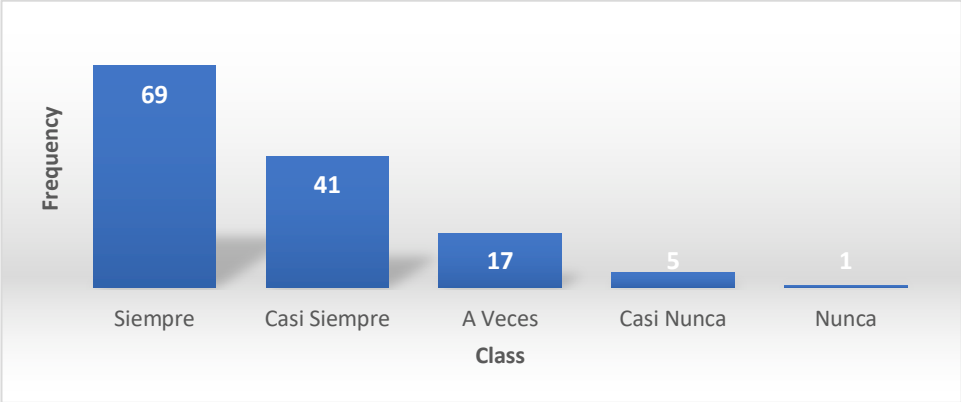
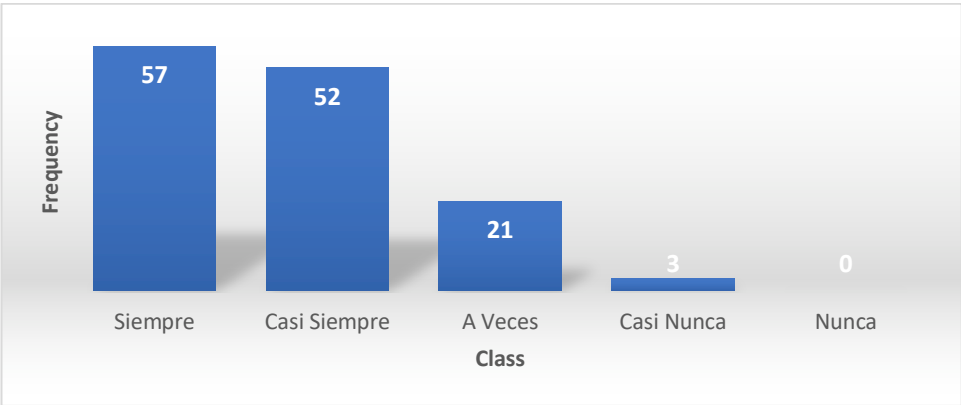
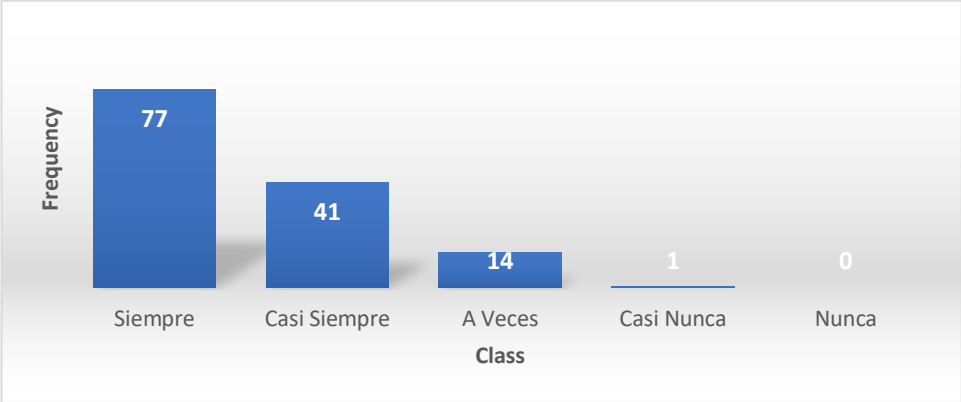


Figure 7a shows that the distribution of frequencies is positively skewed with a mean (μ) of 1.77 and a standard deviation (**σ**) of 0.794, where it is observed that the responses tend to consolidate in 1 to "Always". This suggests that, students consider that new technologies could develop their ability to innovate. In Figure 7b you can observe that the frequency distribution is positively skewed with a mean (μ) of 1.54 and a standard deviation (**σ**) of 0.713, where it is observed that the responses tend to consolidate at 1 to "Always". This suggests that, students consider that digital marketing facilitates the promotion of a venture.

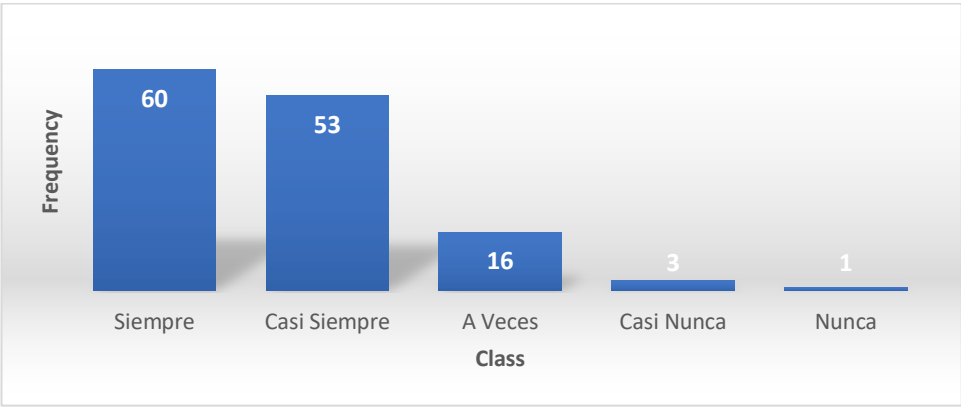
Figure 7. (a) New technologies develop the ability to innovate new ventures. (b) Digital marketing facilitates the promotion of a venture.





In Figure 8a it can be observed that, the distribution of frequencies is positively skewed with a mean (μ) of 1.74 and a standard deviation (**σ**) of 0.816, where it can be observed that, the responses tend to consolidate in 1 to "Always". This suggests that, students consider that technological tools allow customizing services or products. Figure 8b shows that, frequency distribution is positively skewed with a mean (μ) of 1.99 and a standard deviation (**σ**) of 0.917, where it can be observed that, responses tend to consolidate in 2 to "Almost always". Indicating that students consider that having an interactive virtual learning classroom would facilitate the development of skills in the subject of entrepreneurship and management.

*Figure 8. (*a) Technological tools allow the customization of services or products offered by an enterprise. (b) Interactive virtual learning classroom facilitates the development of skills in the subject of entrepreneurship and management.



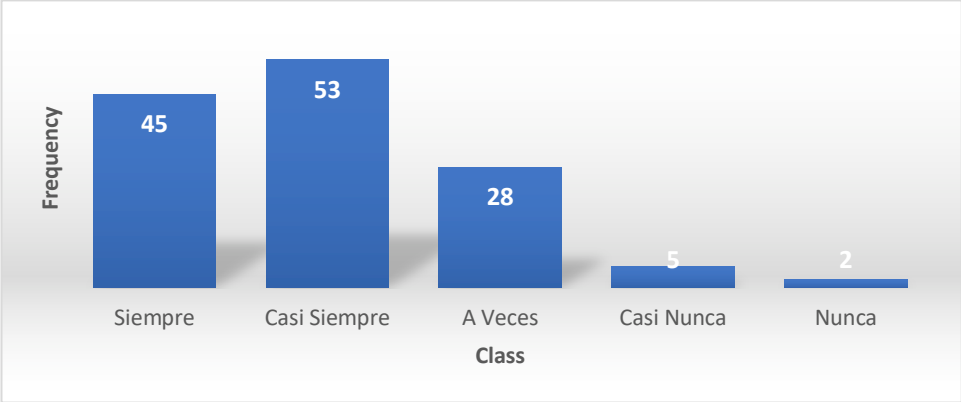


Figure 9a shows that the distribution of frequencies is positively skewed with a mean (μ) of 1.92 and a standard deviation (**σ**) of 0.993, where it can be seen that the answers tend to consolidate in 1 to "Always". This suggests that, students consider implementing a virtual classroom for third baccalaureate students focused on the communicational plan and promotion of an entrepreneurship. In the pie chart represented in Figure 9b, it can be seen that there is a frequent knowledge or interest in technological tools for Advertising Design, Promotion and Market Segmentation, with a standard deviation (**σ**) of 0.873, which suggests a consolidation of the participants' responses with respect to the mean of 2.89.}

As can be seen in Figure 10, each question had a different level of incidence to explain the behavior of each unobserved latent variable (factor). Thus, it was possible to identify that the questions: "Does digital marketing facilitate the promotion of a venture" and "Do technological tools allow customizing services or products offered by a venture?"; are the ones that most allow evaluating the level of development of skills and abilities achieved through ICT, while a correct assessment of the tools for: Advertising Design (Canvas, Photopea, Photoshop, among others), Presentations (PowerPoint, Prezi, Issuu among others) Applications to create webs (Blogs, Wiks, Sites, Wordpress, among others), allow to explain the importance of the use of ICT in the teaching of the subject of management and entrepreneurship.

Taking into account the incidence of each question obtained through the CFA, the mathematical model of the instrument was obtained, which allowed an adequate weighting of the scores assigned to each participant in the instrument in the two factors: importance of ICTs and development of skills.

$$\lambda_{Desarrollo\ Dest.} = 6.327112(0.154p_1 + 0.118p_2 + 0.262p_8 + 0.329p_9 + 0.623p_{10} + 0.571p_{11} + 0.297p_{12} + 0.689p_{13}) \quad (1)$$

$$\lambda_{Importancia\ TIC} = 6.572461(0.433p_6 + 0.482p_{14} + 0.690p_{15} + 0.540p_{16} + 0.342p_{17} + 0.264p_{18} + 0.410p_{19}) \quad (2)$$

Finally, using the mathematical model of equations 1 and 2, the scores for each factor were obtained for each user, which were structured in a new database for the execution

of a test of differences to identify the problems related to the use of ICT in the execution of the subject of entrepreneurship and management. For this purpose, the Mann-Whitney U test was selected as a posteriori mechanism of unpaired comparison for the two types of scores obtained. As can be seen, when contrasting the scores obtained for each factor, it was possible to identify a significant difference between the students' perception of the importance of ICT use and the level of development of skills and abilities reported by them. As can be seen, a p-value of 2.2e-16 was reached, which shows that, at an inferential level, the students scored the importance of the use of ICT in the teaching of the subject highly; however, their level of development of skills and abilities is low.

Through the application of qualitative and quantitative instruments, similar to what has been observed in studies by (Guevara-Vega et al., 2020; Imbaquingo et al., 2019; Jácome-Ortega et al., 2019), it could be observed that the application of a statistical-inferential protocol allowed to accurately determine the most appropriate components, tools and technologies to build an effective virtual classroom proposal that allows to contribute to the improvement of the teaching-learning process of the entrepreneurship and management subject. That is to say, by executing an inferential statistical protocol, it is possible to proceed with a good level of a-priori certainty that is supported by an almost non-existent probability of occurrence of the null hypothesis, which guarantees the success of the designed proposal. This could be ratified at the time of evaluating the designed proposal, which proved to be so effective that, with only the application of the proposed strategy during one curricular unit, it was able to significantly improve the students' skill level in: the use of ICT, logo creation, creation of digital advertisements, creation of entrepreneurship posts, creation of web pages, service offering and creation of digital content for entrepreneurship. Thus, as expected, the proposal has proven to be effective and thanks to an appropriate sampling protocol it can be inferred that this behavior can be extrapolated to any institution in the area, where it is expected to obtain similar results to those observed in the Tulcán Educational Unit.

In addition, the results observed in the present study are in agreement with those detailed in (Argandoña-Mendoza et al., 2020; Martínez and Cobo, 2021).The implementation of ICT in the teaching of the discipline of entrepreneurship, when done in an appropriate manner, has a high potential to facilitate the improvement of meaningful learning in students, since this particular subject requires a great deal of motivation in the student, which, as seen in this research, can be considerably enhanced through the use of contemporary practical tools such as Google Sites, thus promoting interactivity and bringing students closer to the digital tools that they themselves can use to develop any venture that is to their liking.

Scagliusi (2023), emphasizes that communication, interaction and collaboration using digital platforms favor the success and permanence of the business in a market. The evolution of technology in the commercial field gives rise to new markets and the generation of new possibilities for digital entrepreneurship, making it urgent and imperative to implement digital teaching processes within educational centers to guide

future innovative entrepreneurs in a virtual world. Vélez et al. (2020) note that education in the context of entrepreneurship improves practical administrative, creative and innovative skills and the values associated with entrepreneurship.

Different technology tools have an impact on students' perceptions of their overall learning, expected job performance, and employability. Educators use few educational technology tools in this era of rapid innovation to support learning (Clarke et al., 2001). In line with the above students who possess marketable skills become more competent and can better apply their knowledge and grow a business. As a result, students who possess business skills are more employable and benefit the workforce, the community, and the national economy. To better prepare students for business development as an essential component of the educational process, the quality of education in today's context must include other indicators such as e-learning skills (Bellotti et al., 2020).

A major challenge for the modern knowledge society is that while entrepreneurship and management are essential and crucial components of modern societies, their use as a tool to help students learn basic concepts through practice is also putting new pressure on the global economy. On the other hand, entrepreneurship and management can promote social cohesion and increase employment, financial reward and job satisfaction. When it comes to strategic levels, entrepreneurship education rarely receives sufficient attention and is still considered relatively young (Salinas and Gómez, 2015)..

New teaching methods and pedagogies are being developed within the field of entrepreneurship education, which is altering the way society's educational system responds to these changes. This will enable management and entrepreneurship educators to share concepts that support learning (Ratten and Usmanij 2021).

In accordance with the report of the Digital Education Agency for the year 2021 - 2025, it indicates that 70.7% of the Ecuadorian population has access to the Internet from any device and there is a digital gap of 29.30%. (Guaña et al., 2015; Madrid, 2019). This indicates that we are currently living in a global technological era, where traditional teaching techniques are ineffective (Antonio et al., 2018; Madrid, 2019). (Antonio et al., 2018; Aguilar et al., 2019; Latorre et al., 2019).. Today, educational activities have become sustainable in virtually all environments and under all conditions.

Meneses et al. (2023)emphasize that education is democratized through the use of technological tools since information, virtual environments and pedagogy are managed in the educational system. Although some technological tools are handled in an intermediate way, many tools are still in a low state of development (interactive presentations, videos, audios, gamification), so educational institutions should concentrate their efforts on developing these tools .After overcoming two years of pandemic, current education encourages to face new challenges, reflect on the difficulties and continue in the search for educational strategies that enable educational inclusion and equity (Sáez, 2018; Jiménez, 2020).

Conclusions

This study explored the use of technological tools in the development of skills and abilities in the subject of Entrepreneurship and Management applied to third year high school students, under a mixed approach research study. In the quantitative aspect, a survey was carried out with people linked to the subject of Entrepreneurship and Management, whose results allowed identifying and evidencing the significant differences between a low level of development of skills and abilities, and the high importance of implementing ICT in the subject. On the other hand, the qualitative analysis based on interviews applied to experts made it possible to identify the needs that the virtual classroom proposal and its main contents contribute to solve.

From the proposal it can be concluded that the virtual classroom designed was articulated to the needs of students, teachers and the curriculum of entrepreneurship and management of Third Baccalaureate, motivating students to develop their creativity, imagination, curiosity and challenge. Through the technological tool Google Site they helped students to create web pages, where they published their products, reflecting that essential spirit for entrepreneurship.

It is recommended that educational institutions implement strategies to strengthen training programs in technological tools for technical subjects, especially in the area of entrepreneurship and management. In addition, it is suggested to use free access tools that last over time, such as Moodle, which will facilitate that the proposal can be easily implemented in several institutions.

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