Implications of Technology Use for Entrepreneurial Intent in the Context of Mexican Higher Education

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Abstract

This study investigates how the use of educational, communicative, and recreational technologies influences the entrepreneurial intention of 371 university students in Mexico, employing a quantitative approach. A nonprobability sampling method was applied, and multiple linear regression analysis was conducted following a factor analysis to validate the instruments. The results indicate that educational and recreational use has a significant positive impact on entrepreneurial intention, while communicative use was not significant. It is concluded that integrating digital technologies and recreational activities into education can foster creativity and entrepreneurial innovation. However, longitudinal studies are suggested to generalize these findings across different contexts.

Keywords: Entrepreneurial intention, technologies, educational use, communicative use, recreational use.

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Introduction

The global work environment is undergoing constant transformation, driven by the rapid advancement of technology. Automation, digitalization, and globalization have drastically altered the nature of work, demanding that individuals develop new digital and entrepreneurial competencies to adapt to these changes. Additionally, acquiring an innovative mindset is essential for future professionals to thrive in an increasingly competitive and complex world (Jardim, 2021). In this context, adaptability and resilience in the face of technological change can be considered essential competencies for employability and professional success (Akkermans et al. 2018).

Universities, as educational institutions, play a crucial role in integrating tools and methodologies that prepare students to face the challenges of an emerging labor market. Through higher education, it is possible to foster entrepreneurial skills beyond the mere act of starting a business—such as opportunity recognition, risk-taking, innovation, and problem-solving—competencies that are increasingly valued across various industries (Fayolle & Gailly, 2015; Kyndt & Baert, 2015). The incorporation of technology into educational programs could enable a more interactive and accessible learning experience, facilitating collaboration and the exchange of ideas among students across different contexts and cultures (Sangrà & González, 2010; Nambisan, 2017).

At the same time, technologies have revolutionized not only access to information but also the way individuals interact and collaborate (Levin & Mamlok, 2021). Digital platforms and social networks have become important tools that help students connect within the global entrepreneurial landscape. This connectivity broadens their horizons and provides them with a wider perspective on the opportunities and challenges of entrepreneurship in a contemporary context (Khalil, 2023; Cunningham & Menter, 2021). Therefore, the combination of entrepreneurial competencies and the effective use of technology is essential for shaping professionals capable of meeting the demands of a dynamic and technology-driven labor market.

The aim of this study is to investigate how different dimensions of technology use (virtual education, communication, and entertainment) influence entrepreneurial intention (EI) among university students. Through a detailed analysis, the study seeks to identify the key factors that enhance IE in this context. Furthermore, it will examine how the integration of technology in higher education can foster innovation and better prepare future entrepreneurial leaders.

Literature Review

Technologies and Entrepreneurship

The role of technology in entrepreneurship is crucial, as it facilitates access to global knowledge networks and fosters crossborder collaboration. According to Nambisan (2017), technologies amplify individuals' capacity to interact, create, and share information capabilities that are vital for venture development in the digital age (Wu et al. 2024; Obschonka & Audretsch, 2020). In this respect, technological platforms enable entrepreneurs to access information and resources efficiently, thereby promoting creativity and innovation.

Tools such as big data analytics, artificial intelligence, and blockchain as emerging digital paradigms facilitate the creation of global entrepreneurial networks, increasing opportunities for knowledge acquisition and the establishment of essential digital connections (Xie et al., 2024; Obschonka & Audretsch, 2020; Wang et al. 2022).

Fernández (2023) argues that digital competencies play a significant role in entrepreneurial intention (IE), as they enable future entrepreneurs

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to navigate an increasingly technological business environment. These competencies influence entrepreneurs' ability to adapt quickly to market changes and to develop innovative projects (Gilli & Knappstein, 2023).

The skills developed through technology use—such as information management, effective communication, and the handling of digital tools for project creation and promotion—align directly with the abilities necessary for successful entrepreneurship (Fernández, 2023). These digital competencies further impact EI by empowering future entrepreneurs to operate effectively within a technologydriven business context.

Moreover, Fernández (2023) notes that integrating digital competencies into the entrepreneurial process—from design and marketing to implementation—is essential for fostering entrepreneurship and generating new economic activities. In this mutual reinforcement between digital technologies and entrepreneurship, the most critical competencies are communication, interaction, and collaboration via digital platforms.

Technology Use among University Students

The use of technology in academic contexts has been extensively studied over the past decade, particularly for its capacity to influence the development of key entrepreneurial competencies among university students. These competencies are not only essential for academic success but also for professional advancement in an increasingly digitized environment. According to several studies, the use of technological tools in higher education not only facilitates access to knowledge but also fosters fundamental skills such as adaptability, creativity, innovation, and resilience in a changing workplace (Romero et al. 2024; López, 2023; Peralta et al. 2024).

According to Copari et al. (2024), technology use within the university environment can be classified into three primary dimensions: virtual education or educational use (EDUVIRT), mediated interaction or communicative use (COM), and entertainment or recreational use (OCIO). These categories provide a comprehensive framework for understanding how the employment of diverse technological tools contributes to the development of entrepreneurial and digital competencies, especially in a context where problemsolving and collaboration skills are increasingly valued by employers.

It has been found that the educational use of technology facilitates access to a wealth of learning resources and promotes knowledge selfmanagement (Gómez & Williamson, 2018; Pinto et al. 2023). Online learning platforms, for example, enable students to develop selfregulation and autonomy—skills essential in both academic and professional settings. Moreover, the communicative use of technology allows students to strengthen their teamwork and collaboration skills (Espinosa & Saltos, 2024), aspects that are fundamental in the context of entrepreneurship.

On the other hand, the recreational use of technology, though primarily associated with entertainment, also contributes to the development of skills such as creativity and improvisation, driven by student motivation, both of which are key for innovation (Veytia et al. 2023; Cuetos et al. 2020). Furthermore, digital leisure can play a significant role in strengthening digital competence by exposing students to a variety of tools and platforms that they can later apply in more formal contexts (Gil et al.2024).

Digitalization has spurred interest in developing entrepreneurial competencies among university students, particularly in areas related to innovation and adaptability. According to Fernández (2023), the integration of technologies in educational settings enables students to acquire entrepreneurshiprelated competencies—such as idea generation and leadership within collaborative networks—that are indispensable in today's business environment.

As university students gain experience using these technologies, they develop skills that enable them to adapt quickly to changes and challenges (González, 2018), a fundamental characteristic of entrepreneurship. The ability to manage information and communication through digital technologies thus becomes a competitive advantage for graduates entering a labor market characterized by complexity and high dependence on digital competencies (Gómez, 2022).

It can thus be stated that the use of technology in academic settings not only facilitates access to knowledge but also significantly contributes to the development of digital and entrepreneurial competencies. These competencies are not only essential for entrepreneurship in the digital age but also prepare students to face the challenges of the future of work, where adaptability, innovation, and technological proficiency will be fundamental skills to thrive in an increasingly complex and techdriven labor market. Within this framework of educational, communicative, and recreational technology use, one can envision a more holistic higher education that cultivates future professionals not only in technical mastery but also in critical soft skills for personal and professional development.

Methodology

This study examines how dimensions of technology, namely virtual education, communication and interaction, and leisure affect entrepreneurial intention (EI) among university students. From an integrative perspective, the methodology combines data-collection strategies, instrument validation, and statistical analyses in alignment with recent research in entrepreneurship and higher education.

A quantitative, cross-sectional survey design was adopted. This approach enables simultaneous examination of multiple dimensions and their relationship with EI, providing a solid foundation for understanding key determinants in educational contexts.

The instruments employed were developed and adapted based on both international literature and the characteristics of the local context. To measure the dimensions of virtual education, communication and interaction, and leisure, we used scales derived from Coppari (2018; 2024), which underscore the importance of technology in

learning and innovation. These scales were validated through exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), ensuring internal consistency and unidimensionality. Entrepreneurial intention was assessed using an adapted version of the questionnaire by Valdivia et al. (2021), with contributions from Cortez and Filho (2020). Expert review guaranteed the instrument's content validity, with specialists providing feedback on item clarity and relevance. Stratified sampling was employed to ensure representativeness of the target population, encompassing university students from various faculties, genders, and socioeconomic backgrounds. Although non-probability sampling was chosen due to time and logistical constraints that precluded a broader random sample, the stratified approach addressed key demographic characteristics. Sample size was calculated for a finite population following the statistical criteria of Ojeda et al. (2016), resulting in 386 participants. Data was collected via online surveys distributed through platforms such as WhatsApp and institutional email, leveraging their widespread accessibility among students for efficiency and rapid reach.

Statistical analysis proceeded in two complementary stages: first, an exploratory factor analysis to investigate the data's dimensionality and validate the scales (Moreno & Plancarte, 2024); second, a confirmatory factor analysis to verify the constructs' underlying structure, confirming high internal consistency and convergent validity. Finally, a multiple linear regression model was employed to examine the relationships between technology-use dimensions and EI (Ferrando & Anguiano, 2010; Vilà et al. 2019).

This methodological framework not only ensures the validity and reliability of the instruments but also provides a comprehensive understanding of how different facets of technology use influence entrepreneurial intention among university students.

Results

In the sociodemographic analysis of the university student sample, women comprised the majority (66.75%), and a large share were enrolled in Business Administration degree programs (87.7%), with ages between 18 and 22 years. Most respondents reported belonging to a middle socioeconomic stratum (72.4%), which may influence their professional development opportunities and entrepreneurial capacities.

Regarding family background, 38.8% indicated that they have close relatives who are entrepreneurs, while 19.9% have at least one parent engaged in entrepreneurial activity, suggesting a potentially positive familial influence on entrepreneurial orientation. In terms of work experience, 36.2% had never been employed, although 22.7% have started or currently operate their own business, reflecting a burgeoning entrepreneurial mindset in this cohort.

Overall, this university population is characterized by a pronounced inclination toward entrepreneurship and management, shaped to a significant degree by both familial antecedents and personal work experience. These factors are essential for understanding their aspirations and the barriers they may encounter when developing entrepreneurial initiatives.

Preliminary Data Analysis and Assumptions Prior to EFA

Before conducting the Exploratory Factor Analysis (EFA), the assumptions of normality, linearity, and multicollinearity were assessed to avoid producing misleading results (Pérez & Medrano, 2010).

As an initial step, an exploratory analysis was conducted to detect outliers using the Mahalanobis distance (D^2) method. Following the recommendations of Pérez and Medrano (2010), 10 multivariate outliers exceeding the threshold of $p < .001$ were identified. In accordance with Hair et al. (2007), these cases were removed, resulting in 376 valid responses for analysis.

Additionally, univariate outliers were detected using standardized *z*-scores, with a cutoff of ±3 (Pérez & Medrano, 2010). Based on this criterion, five further cases were excluded, leaving a final sample of 371 responses for analysis.

Once outliers had been addressed, the assumption of normality was evaluated through skewness and kurtosis indices. While some authors (e.g., Ferrando et al., 2022; Ferrando & Anguiano, 2010; Muthén & Kaplan, 1985) accept values between -1 and +1, others such as Forero et al. and Bandalos and Finney (2018) consider broader thresholds, ranging from -1.5 to +1.5 or even -2 to +2 (Lloret-Segura et al., 2014). For this study, a conservative range of -1 to +1 was applied, and most variables met this criterion, supporting the assumption of normality. The Kolmogorov-Smirnov test also yielded a significant value of .000, confirming acceptable normality across variables.

To assess linearity, a curvilinear estimation was performed using multiple regression analysis, incorporating both linear and quadratic terms to examine the nature of the relationships between variables. Results confirmed that the linearity assumption was satisfied (Pérez & Medrano, 2010).

Multicollinearity was assessed through a diagnostic analysis of inter-variable correlations. Correlation values below 0.90 were considered acceptable to maintain a stable factor solution (Pérez & Medrano, 2010; Martínez, 1999). Tolerance values above 0.10 and Variance Inflation Factor (VIF) values below 10 were found across all variables, indicating no serious multicollinearity issues (Vilà et al. 2019).

Following the verification of these assumptions, and prior to proceeding with factor analysis, the overall significance of the item set was evaluated using the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity. The KMO value was 0.874, while Bartlett's Test produced a chi-square value of 4504.511 with a significance level of .000—strong indicators of sampling adequacy and factorability.

To finalize the preliminary assumption-checking phase, two additional procedures were conducted: (1) the Measure of Sampling Adequacy (MSA) at the item level, and (2) the anti-image correlation matrix (CAI), both of which are used to identify problematic or defective items that may distort the factor structure (Ferrando et al. 2022). MSA values below 0.50 were deemed unacceptable, while CAI values ideally should be close to zero, with 0.30 as the maximum acceptable value. In the present analysis, MSA values were within acceptable ranges, and CAI results indicated no problematic items.

Given the results of these evaluations, the data were deemed suitable for conducting the Exploratory Factor Analysis.

Factor Extraction in the Exploratory Factor Analysis (EFA)

The factor extraction was performed using Principal Component Analysis (PCA) with Varimax rotation. In terms of communality values, these should be equal to or greater than 0.50 to be considered acceptable contributions to the factor solution (Gutiérrez, 2019). In the present analysis, communality values ranged from 0.380 (EDUVIRT1) to 0.819 (EI4). Therefore, all variables demonstrated acceptable levels of contribution except for EDUVIRT1, which was subsequently removed. A revised analysis yielded acceptable communality values across all remaining variables.

According to Kaiser's criterion (eigenvalues greater than 1), four principal components were identified, explaining 68.480% of the total variance.

An approximate review of the rotated component matrix indicated that the number of extracted components aligns with the originally proposed structure of the questionnaire, supporting its conceptual integrity.

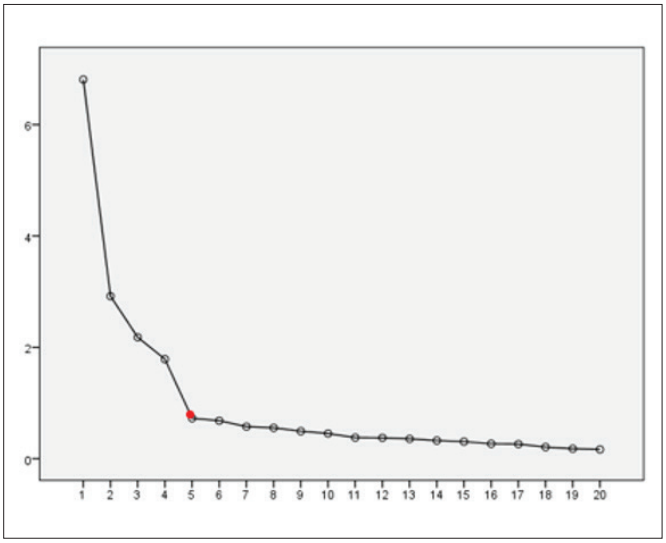
Table 1. Rotated Component Matrix

Item	Component			
	1	2	3	4
EDUVIRT8	.777			
EDUVIRT4	.775			
EDUVIRT7	.768			
EDUVIRT6	.758			
EDUVIRT3	.727			
EDUVIRT5	.719			
EDUVIRT2	.708			
COM4		.881		
COM2		.839		
COM3		.835		
COM5		.812		
COM1		.717		
EI1			.862	
EI2			.849	
EI4			.849	
EI3			.809	
OCIO2				.857
OCIO3				.823
OCIO1				.793
OCIO4				.668

Note: Extraction method: Principal Component Analysis. Rotation method: Varimax normalization with Kaiser. Created by the author based on data obtained from SPSS (Statical Package for the Social Sciences).

The interpretation of the scree plot helped establish a better criterion for factor extraction, identifying the optimal number of factors. This allows for the identification of the inflection point, where the eigenvalues stop forming a slope and begin to decline with minimal inclination (Ferrando et al.2022; Pérez & Medrano, 2010). Using Kaiser's criterion and the scree plot, it was suggested that only four factors should be interpreted, as the slope or decline of the graph is interrupted starting at the fourth eigenvalue. Therefore, following Pérez and Medrano (2010), factors with correlations of 0.40 or higher will be considered for interpretation, resulting in factors 1, 2, 3, and 4 being retained.

Figure 1. Scree Plot



Source: Created by the author using data obtained from SPSS (2024).

The results can be observed in Table 2. The values for the distribution of the factors show good loadings, with each factor being associated with four or more variables.

Table 2. EFA Results

Indicator	Value	Analysis
Number of Variables	4	Meets the condition for the number of variables
Cronbach's Alpha	0.894	Acceptable value
Determinant	5.89E-06	Close to 0, acceptable
KMO	7.40E-01	Excellent value, indicating data validity
Estimated Chi-Square	4365.136	Indicates that the study can continue, as it is higher than the tabulated value
Total Explained Variance	68.48%	The cumulative variance is close to 70%, thus defining the number of components and explaining the issue coherently
Communalities	Greater than .825	Meets the criterion of being greater than .5
	Minimum.524	

Note: Created by the author using data obtained from SPSS.

Once the number of non-trivial factorizations and the respective variables associated with each have been obtained, the normalization of the names of each factor is conducted according to the relationships of the variables contained within them. This process of naming the factors is summarized in Table 3.

Table 3. EFA Factors

Factor	Code	Associated Variables	Contribution Percentage
Virtual Education	EDUVIRT	EDUVIRT8, EDUVIRT4, EDUVIRT7, EDUVIRT6, EDUVIRT3, EDUVIRT5, EDUVIRT2.	34.049
Communication	COM	COM4, COM2, COM3, COM5, COM1	14.591
Entrepreneurial Intention	EI	EI1, EI2, EI3, EI4	10.903
Leisure	OCIO	OCIO2, OCIO3, OCIO1, OCIO4	8.938

Note: Created by the author using data obtained from SPSS.

Once the factors have been obtained and named, along with their respective variables, the internal consistency can be observed in Table 3, expressed by a Cronbach's Alpha of 0.894. According to Morales and Medina (2021), this represents adequate reliability of the instrument, as the internal consistency of the factors is greater than 0.700, which is the recommended minimum value.

Table 4. New EFA Values

Cronbach's Alpha	Number of Items
.894	21

Note: Created by the author using data obtained from SPSS (2024).

Regarding the identified factors, they are summarized in Table 3. Factor one, named Virtual Education, is related to the use of digital platforms and technological tools to facilitate learning, where students access educational content and participate in academic activities through the Internet.

As for factor two, designated as Communication, it is conceptualized as the use of information and communication technologies (ICT) to exchange information, ideas, and feedback between students and teachers, thus facilitating collaborative and effective learning.

Factor three, called Entrepreneurial Intention, refers to the determination to undertake something, based on the degree of favorable or unfavorable evaluation an individual has toward the behavior in question, in the event of carrying out an entrepreneurial action. Factor four, named Leisure, is defined by the recreational and entertainment activities that individuals choose to engage in during their free time, which can be facilitated and enriched by the use of technologies, such as video games, social media, and platforms..

Multiple Linear Regression Analysis

The regression analysis was selected to examine the relationship between the dependent variable (EI) and the independent or predictor variables (EDUVIRT, COM, and OCIO). The results of the model are summarized in Table 5.

Table 5. Model Summary.

R	R-squared	Adjusted R-squared	Standard Error of the Estimate
.475[a]	.225	.219	3.28223

Note. Prepared by the author using data obtained from SPSS.

The correlation coefficient R of 0.475 suggests a moderate correlation between the predictor variables and EI. As shown in Table 5, the R^2 value of 0.225 indicates that approximately 22.5% of the variability in EI can be explained by the variables in the model. This suggests that other factors may influence EI that are not considered in this analysis.

To assess the significance of the regression model, an analysis of variance (ANOVA) was conducted, and the results are detailed in Table 6.

Table 6. ANOVA Analysis.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1150.465	3	383.488	35.597	.000[b]
Residual	3953.702	367	10.773		
Total	5104.167	370			

Note. Own elaboration based on data obtained from SPSS.

The ANOVA results show that the model is highly significant ($F(3, 367) = 35.597$, $p < 0.001$), indicating that at least one of the predictor variables influences EI. This result highlights the validity of the model, suggesting that the combination of EDUVIRT, COM, and OCIO contribute significantly to explaining the variability in the participants' EI.

The coefficients obtained in the regression model are presented in Table 7.

Table 7. Beta Coefficients.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	β	Std. Error	Beta		
(Constante)	**3.368**	**1.187**		**2.837**	**.005**
COM	.072	.046	.077	1.565	.118
OCIO	.260	.058	.229	4.474	.000
EDUVIRT	.241	.039	.305	6.118	.000

Note. Own elaboration based on data obtained from SPSS.

The results indicate that: EDUVIRT ($\beta = 0.305$, $p < 0.001$) and OCIO ($\beta = 0.229$, $p < 0.001$) are significant predictors of EI. This suggests that as virtual education and time dedicated to recreational activities increase, so does EI, implying that these factors may motivate individuals to become more involved in

activities related to their personal or professional development. COM ($\beta = 0.077$, $p = 0.118$) does not show a significant effect on EI, which may indicate that communication, in this specific context, does not directly influence participants' decisions or that its impact is mediated by other factors not included in the model.

Discussion

Research on the impact of EDUVIRT, COM, and OCIO on EI reveals significant patterns that highlight the importance of technology use in the development of entrepreneurial skills. The results indicate that EDUVIRT has a positive and significant effect on students' EI. This finding suggests that digital platforms can motivate students by offering more flexible and accessible learning.

According to Yin et al. (2024), technological factors can enhance student satisfaction in virtual education, which implies that educational institutions should adopt innovative strategies that utilize these technologies to foster an environment conducive to technology-centered entrepreneurship (Rosienkiewicz et al., 2024), and also combine didactic and dialogic methodologies, supported by digital tools, making them imperative opportunities for entrepreneurship (Arcentales et al. 2020).

On the other hand, although COM may be a crucial element in the educational process (Acosta et al. 2022), this study revealed that its effect on EI was not significant. This could be due to limited virtual interaction and a lack of adequate communication skills, in this case to drive EI, as well as technical challenges and the less interactive nature of digital environments (Yan & Pourdavood, 2024). These factors may have inhibited the perceived development of capacities necessary to foster collaboration, creativity, and motivation toward creating new entrepreneurial initiatives.

This indicates that, although communication tools are available, it is essential to train students in communication and teamwork skills so that they can collaborate effectively in their entrepreneurial projects (Llorente et al. 2023; Mahmudin, 2023). Therefore, better understanding and further research into COM is necessary to better harness its potential, as noted by Manca and Ranieri (2017).

OCIO is practiced freely in the pursuit of pleasure, setting aside necessity and benefit (Pérez & Devita, 2023), and although it may seem at odds with the goal of entrepreneurship, it was shown to have a positive impact on EI. This suggests that recreational activities can foster creativity and innovation, which are key factors in entrepreneurship within a business environment (Córdoba et al. 2018).

These results may be due to what Coppari (2024) indicates, who reports that OCIO ranks among the top uses among youth, with social isolation and forced virtualization being the main reasons for using technology to connect with family, friends, and peers. Varela et al. (Varela et al. 2016) note that leisure centered on the use of the internet and social networks has gained significant presence in youth socialization, becoming the main socializing agent. Contrary to the belief that it may have negative consequences due to potential misuse; this study shows that it can have a positive impact—on EI in this case—suggesting that OCIO should not be viewed as risky but rather as an opportunity to enhance EI.

Cutolo and Grimaldi (2023) argue that digital leisure does not directly lead to entrepreneurship, but in relation to EI, it can be realized through passion, when potential entrepreneurs recognize the positive attention and recognition they can receive. Therefore, OCIO may offer a space for exploration and experimentation, fostering a favorable environment for entrepreneurial thinking.

Hence, it is essential for educational institutions to incorporate OCIO activities that stimulate creativity, attitude, and informal learning, which could increase students' intention to engage in entrepreneurial activities (Wang et al., 2021; Anggraeny, 2023).

Despite being ranked last in studies such as Coppari (2024), the use of EDUVIRT proves significant for IE, leading to the conclusion that universities should continue to promote educational use and implement academic strategies for technology integration.

The interrelationship between EDUVIRT, OCIO, and EI indicates that a comprehensive approach to teaching can significantly enhance EI. Educators should work to integrate these dimensions in ways that enrich the student experience and foster an environment conducive to entrepreneurship.

According to Kassean et al. (2015), traditional classroom activities may negatively affect entrepreneurial intentions, so it is necessary to consider the design and updating of learning environments that incorporate distinct aspects of the student experience, which may result in increased motivation and engagement with entrepreneurship. One of these aspects is the inclusion of technology use in class—not only EDUVIRT but also OCIO.

This aligns with the view of Hammoda (2022), who emphasizes that traditional entrepreneurship education lacks effectiveness in stimulating and teaching entrepreneurship. This highlights the need for educational programs to focus not only on academic content but also on developing practical and entrepreneurial skills. Young people report that mastering modern business skills is essential, and that they find social media and multimedia appealing, novel, and useful.

Finally, this research underscores the need for a continuous approach to the evaluation and improvement of educational practices related to entrepreneurship. As technologies and teaching methods evolve, too must the pedagogical strategies that promote EI. Educational institutions must strive to stay aligned with emerging trends and best practices in entrepreneurial education to ensure that their programs remain relevant and effective.As Chen et al. (2021) assert, education as a driver of EI must adapt to current student needs by embracing new technologies, and in doing so, foster entrepreneurial spirit to prepare future leaders in the business world.

The results of this study reveal that educational and recreational use of technologies has a positive and significant impact on university students' EI, while communicative use did not show a relevant relationship. These findings align with existing literature that emphasizes the importance of digital competencies in fostering EI (Fernández, 2023; Gilli & Knappstein, 2023). Students' ability to interact and collaborate through digital platforms may be linked to their exposure to educational environments that promote creativity and innovation. Evidence suggests that educational institutions should prioritize the integration of educational and recreational technologies into their curricula. This may include developing courses that not only teach technical skills but also create an environment where students can experiment with entrepreneurial projects using digital tools. The implementation of active and collaborative methodologies, such as project-based learning, can further enhance these competencies.

Theoretical Implications

The theoretical implications of the findings contribute three significant insights to the literature on entrepreneurial education and technology adoption. First, the model of the Theory of Planned Behavior (Ajzen, 1991) is expanded by demonstrating that both educational and recreational use of technology strengthens the attitudinal component, thereby increasing Entrepreneurial Intention (IE). In this regard, the incorporation of technological variables into the theoretical model provides a deeper explanation of how virtual experiences can enhance entrepreneurial behaviors.

Second, the results align with the framework of the Entrepreneurial Event Theory (Shapero & Sokol, 1982), as they show that non-traditional factors such as recreational activities (OCIO) act as triggers of EI by fostering creativity and the ability to identify emerging opportunities—an aspect also addressed by Krueger (2000).

Finally, in the field of technology adoption, these results present a challenge to the UTAUT model (Viswanath et al. 2003), by showing that, in the context studied, communicative use (COM) does not significantly influence EI. This suggests that, in specific educational settings, variables associated with social influence or effort expectancy may not be as decisive as in other contexts, which aligns with the perspective of Nambisan (2017) and recent studies by Fernández (2023).

Therefore, the proposed model invites a rethinking of the interrelationship between technology use and entrepreneurial intention, especially in emerging economies, where the sociotechnical context significantly shapes these relationships.

From a political perspective, the findings underscore the need to design policies that support the development of digital competencies from early education through to higher education. This could include incentives for programs that integrate technologies into the classroom and promote an interdisciplinary approach to entrepreneurship. Additionally, it is crucial to foster partnerships between universities and businesses to create spaces where students can apply their technological knowledge in real-world contexts, thereby facilitating their transition into the workforce.

Given the lack of impact of communicative use on Entrepreneurial Intention (EI), further research is recommended to explore this aspect in greater depth. It is possible that current communication tools are not being used effectively to foster an entrepreneurial mindset. Therefore, future studies could examine which specific characteristics of communicative use might be more effective in influencing EI.

This study not only contributes to the understanding of the role of technology in entrepreneurship but also provides valuable insights for improving educational practices and policies related to entrepreneurship, ensuring that students are better prepared to meet the challenges of the contemporary labor market.

Limitations and Future Research

Although the results provide relevant evidence regarding the impact of the educational and recreational use of technologies on entrepreneurial intention, it is important to acknowledge some methodological limitations. The cross-sectional design used in this study prevents the establishment of causal relationships between variables, so future research should consider longitudinal studies or experimental designs to track the evolution of entrepreneurial intention over time (Creswell & Poth, 2018).

Additionally, the sample was limited to a single Mexican university, which restricts the generalizability of the findings to other institutional and cultural contexts in Latin America. Therefore, it is recommended to replicate the study in institutions with distinct characteristics, considering rural and technical contexts, to assess whether the relationship between technology use and entrepreneurial intention persists in environments with varying technological infrastructure and entrepreneurial culture (Gómez, 2022).

These limitations underscore the need to interpret the results with caution and suggest future research directions that can strengthen the external validity of the model.

Conclusion

This research underscores the relevance of the virtual environment and its use as a key determinant for increasing entrepreneurial intention (EI) among university students. Through the findings, it is established that online educational platforms facilitate access to content and create an environment conducive to the development of entrepreneurial commitment. This approach aligns with the need to adapt educational programs to the demands of the modern business environment, ensuring that students are prepared to face challenges in the field of entrepreneurship.

One of the crucial uses identified is the importance of communication (COM) in the context of EI. Although its direct impact on EI was not significant, students' ability to communicate and collaborate effectively is considered essential in the development of business skills. This evidence highlights the need to integrate targeted training that strengthens communication competencies, which could facilitate a more dynamic and collaborative learning environment. Therefore, further research is important to lead to a better understanding of this topic.

The analysis revealed that the use of virtual education (EDUVIRT) and leisure (OCIO) plays a positive role in EI, suggesting that both recreational and academic activities can contribute to the development of creativity and innovation. This opens new opportunities for educational institutions to consider the inclusion of recreational experiences as part of the teaching-learning process. The combination of traditional learning and experiential learning could enrich student education and foster a creative environment that stimulates their entrepreneurial intention.

Despite the findings, some limitations must be acknowledged in this study. The research was conducted in a single university, which limits the generalizability of the results. Cultural and contextual differences across various institutions could influence EI differently. Furthermore, the cross-sectional methodology used emphasizes the need for longitudinal studies that allow for a deeper analysis of the evolution of EI over time.

In addition to the limitations already acknowledged, it is important to highlight that the quantitative and cross-sectional design of the study prevents establishing causal relationships between technological use and entrepreneurial intention (EI). The underlying mechanisms and the evolution of these effects over time have not been analyzed, which opens the need for the implementation of qualitative approaches or longitudinal studies (Creswell & Poth, 2017).

Regarding the generalizability of the results, although diversity in the sample was considered in terms of disciplines and socioeconomic levels, the research was conducted at a single Mexican university. This limits the applicability of the findings to other higher education contexts in Latin America, where there may be significant variations in technological infrastructure, entrepreneurial culture, and access to digital resources (Gómez, 2022). It is recommended to replicate this study in rural, technical contexts, and institutions with diverse demographic characteristics, using techniques such as structural equation modeling (SEM) or quasi-experimental designs to strengthen both the internal and external validity of the model.

Nonetheless, this study makes a significant contribution to the field of entrepreneurship. It provides an empirical foundation for future research on the relationship between virtual education and entrepreneurship, highlighting the need to integrate digital technologies into student training. Furthermore, it opens space for further investigation into the impact of leisure activities on entrepreneurial learning, which could inspire institutions to develop more innovative curricula adapted to the realities of entrepreneurship in an increasingly digital world.

In conclusion, this entrepreneurial research emphasizes various key strategies for enhancing education in digital environments. First, it is recommended that universities establish academic partnerships to share data and resources, which would enable broader and more enriching studies on entrepreneurship. Additionally, the importance of integrating specific educational programs in digital communication, a fundamental skill in modern entrepreneurship, is highlighted. This would strengthen students' ability to collaborate and adapt in work environments.

Moreover, it is suggested to implement longitudinal tracking tools that, through periodic surveys, would allow for detailed monitoring of students' entrepreneurial evolution. This, along with the constant review of questionnaires and measurement instruments, would help capture new and influential factors in entrepreneurial development. Finally, continuous evaluation and adjustment of the educational curriculum would ensure that training programs remain updated and relevant to the changing needs of the business environment.

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