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DOI: https://doi.org/10.34069/AI/2025.86.02.17

How to Cite:
Balón Cantos, S.L., Mota Arteaga, R.C., Ponce Gordillo, O.J., Moy-Sang Castro, S.M., & Molina Barzola, M. (2025). "The mil aulas tool in moodle for meaningful learning in entrepreneurship and management: A case study in ecuadorian high schools". *Amazonia Investiga*, *14*(86), 226-238. https://doi.org/10.34069/AI/2025.86.02.17

"The mil aulas tool in moodle for meaningful learning in entrepreneurship and management: A case study in ecuadorian high schools"

"Herramienta mil aulas en moodle para el aprendizaje significativo en emprendimiento y gestión: Un estudio de caso en bachillerato ecuatoriano"

Received: July 27, 2025 Accepted: September 27, 2025

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Abstract

The rapid and progressive advancement of computerized technology has compelled educational processes to migrate toward learning environments that require the use of digital platforms and tools. These environments foster the exploration and experimentation of contextualized didactic designs, with implications for the development of skills that transcend purely theoretical knowledge. This article aims to analyze the applicability of pedagogical methodologies for implementing collaborative practices among third-year students of the Unified General Baccalaureate (BGU) in Ecuador, specifically within the curricular unit of Entrepreneurship and Management, mediated by the Mil Aulas tool in Moodle. The theoretical framework is grounded in the approaches of Ausubel, 1983 and Siemens,

Resumen

El avance vertiginoso y progresivo de la tecnología informatizada ha generado en materia educativa, la migración forzosa de los procesos hacia entornos de aprendizaje que demandan el uso de plataformas y herramientas digitales que inducen a la exploración y experimentación de diseños didácticos contextualizado, con implicaciones en el desarrollo de habilidades que transcienden lo meramente teórico. Este artículo tiene como objetivo analizar la aplicabilidad de metodologías pedagógicas para implementar prácticas colaborativas en estudiantes de tercer año del Bachillerato General Unificado (BGU) en Ecuador, específicamente en la unidad curricular de emprendimiento y gestión, mediada por la herramienta Mil Aulas en Moodle. El marco teórico se sustenta en los enfoques de Ausubel, 1983 y Siemens, 2004, desde una perspectiva

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2004, from a socioconstructivist perspective. Methodologically, a non-experimental, cross-sectional design was adopted within a projective research approach, using a census sample of 90 students from the Tonchigüe High School in Atacames, Ecuador. Based on the average performance across the four groups, the findings indicate that mean scores increased by 90%, rising from 4.88 in the pre-test to 9.28 in the post-test. This result demonstrates a significant improvement in students' academic performance, strengthening their knowledge of markets and advertising, and contributing to meaningful learning.

Keywords: Educational environment, educational innovation, teaching method, pedagogical practice, ICT.

socioconstructivista. Metodológicamente, se optó por un diseño no experimental y transversal dentro de un enfoque de investigación proyectiva, con una muestra censal de 90 estudiantes del Colegio de Bachillerato Tonchigüe en Atacames, Ecuador. En base al promedio de los cuatro paralelos, los hallazgos muestran que las puntuaciones medias aumentaron en un 90%, pasando de 4.88 en el pretest a 9.28 en el postest. Este resultado evidencia un incremento significativo en el rendimiento académico de los estudiantes, fortaleciendo el conocimiento sobre el mercado y la publicidad, y contribuyendo al aprendizaje significativo.

Palabras clave: Ambiente educacional, innovación educacional, método de enseñanza, práctica pedagógica, TIC.

Introduction

The results of global studies conducted until 2023 by EntreComp and GEM (Global Entrepreneurship Monitor) on the development of entrepreneurial competencies in high school students worldwide show that, in Europe and Asia, the focus is high, emphasizing the development of critical thinking, creativity, and innovation. In the United States and Canada, it is also high; in Latin America, the level is medium due to limited teacher training, and in Ecuador, it is medium as well, but it is more centered on theories than on skills. This results in minimal development of labor competencies, limiting future labor insertion (Lasio et al., 2020; McCallum et al., 2020).

In the educational institution, Colegio Bachillerato Tonchigüe, where this study is focused, it is aligned with the national curriculum of the Ministry of Education, effective since 2016. The theoretical application prevails, with minimal practical implementation, resulting in only 40% of learning achievements, with minimal development of skills in Entrepreneurship and Management and digital competencies. One of the causes is the lack of teacher training in the use of digital technology and methodologies for applying these in the classroom, making it imperative to improve and address the inequality of opportunities this situation creates.

Technology has integrated into daily life in such a way that from an early age, individuals are immersed in smart devices, providing access to global information and communication. The constant use of technology raises questions about its effects on cognitive, emotional, and social development, and underscores the need to design educational strategies that take into account the opportunities and challenges of digital immersion for student growth and well-being (Höfrová et al., 2024).

The pedagogical approach to education must be comprehensive and based on the socioconstructivist model (Lev Vygotsky), and should align with the theories of meaningful learning (David Ausubel), Hebegogic theory in education, and connectivism according to George Siemens, which promote active student participation. Therefore, connectivism, as a learning theory, highlights the importance of knowledge networks and students' ability to connect and interact with various sources of information. This approach proposes that learning occurs individually, but it also nurtures interactions within a network of connections, facilitated by digital platforms like Mil Aulas. Through this environment, students can access content, collaborate, share ideas, and build collective knowledge. In this way, connectivism promotes the development of technological and cognitive competencies, preparing students to navigate an increasingly interconnected world, fostering flexible, autonomous, and collaborative education that meets the needs of the 21st century.

Within the educational sphere, Information and Communication Technologies (ICT), through the use of platforms, help the student's progress in the teaching-learning process, meaning they play an active role, transforming their role from passive receivers to active participants (Díaz Vera et al., 2021). Furthermore, the incorporation of ICT has been seen as a tool to reconfigure teaching methods and promote educational

innovation, responding to policies that aim to improve competitiveness and adapt schools to the demands of the 21st century. In this regard, virtual environments have been conceived as the key to the integral development of individuals, enabling them to face social changes and transformations (Bicalho et al., 2023).

The aim of this research is to analyze the impact of the use of virtual environments and digital tools to achieve competencies and skills for meaningful learning in the subject of Entrepreneurship and Management in Unit 3, Market and Advertising, taught to third-year General Unified Baccalaureate (BGU) students at Colegio Bachillerato Tonchigüe, located in Atacames, Esmeraldas.

This research follows a mixed approach (qualitative and quantitative), being descriptive in depth, with a non-experimental and cross-sectional design. The sources are both documentary and field-based. The theoretical methods employed were the theoretical-empirical method and the inductive-deductive method. The study used empirical methods (surveys, interviews, and pre-tests and post-tests, as well as mathematical statistics tools like SPSS), which allow for establishing the research phase of an improvement proposal: Mil Aulas.

In the social progress journey, achieving meaningful learning in students, particularly in the third year of the General Unified Baccalaureate (BGU) in Ecuador, mediated by virtual environments using the Mil Aulas tool, represents an important part of the formation process. This component allows students to create, innovate, decide, self-employ, and empower themselves with e-resources, transforming it into an ideal digital space that facilitates learning.

Furthermore, the transformation of the educational system requires the immersion of emerging paradigms in the conception of teaching and learning competencies and skills mediated by ICT, given the transcendence of theoretical boundaries in the delivery of content towards the use of digital methods and strategies. These refer to a series of metacognitive activities, as third-year BGU students belong to a generation that is socioculturally immersed in the digital era. Designing a virtual environment with the Mil Aulas tool on the Moodle platform for the Entrepreneurship and Management subject enables the development of skills, competences, and personal and professional development in a society that is aiming for significant changes.

Theoretical framework

Meaningful Learning in Virtual Environments

Education has gone through big transformations over time, and every change has left its mark. It is not just about moving from one teaching method to another, it is about the way people relate to knowledge itself. As Jasso & Villagran (2025) suggest, education has become a stage where teachers, students, and even policymakers play a role, and where methods and models are constantly questioned. Calderón et al. (2020) remind us that these shifts are not superficial: they affect how content is delivered, how it is absorbed, and even how experiences are lived. The truth is that the arrival of digital platforms has pushed this transformation faster than ever.

When we talk about meaningful learning, we are talking about a different way of teaching and learning, one that is deeper and more personal. Zurita et al. (2025) point out that this kind of learning can completely reshape how knowledge is built in the classroom. Vargas-Hernández & Vargas-González (2022) explain it well: meaningful learning happens when students connect new experiences with what they already know, and in doing so they do not just memorize, they truly make sense of what they are learning. Imagine a student who learns about market segmentation not by reading a definition, but by designing a small survey among classmates. That experience sticks, because it links theory to life.

Virtual environments are key in this because they give students room to go at their own pace and connect with others in ways that the traditional classroom often does not allow. Comas González et al. (2017) note that this flexibility is one of their strongest features. And yes, as Vergara et al. (2019) show, these tools can make training more effective. But, as Horna Li, & Seminario Unzueta (2023) warn, not everything is perfect: virtual learning also brings doubts and debates. Some students thrive in these spaces, while others get lost, distracted, or even discouraged. It is a double-edged sword.

There are also many flavors of virtual spaces. Vargas-Murillo (2021) and Rubio et al. (2022) talk about four in particular: structured e-learning platforms, personal blogs, collaborative wikis, and interactive social networks. Each has its strengths. Blogs can give students a voice, wikis build collective knowledge, and social networks create vibrant communities. But all of them share one condition: they only work if there is real preparation and feedback behind them (Albitres-Mendoza & Duran-Llaro, 2024). Otherwise, they risk becoming noise instead of tools. And we cannot ignore the hard reality: lack of connectivity, limited access to devices, and insufficient training for teachers are still obstacles that weigh heavily, especially in rural or vulnerable areas (Guarnizo Cajamarca et al., 2025).

And then come the bigger challenges. Beyond the technical issues, there is the question of how to keep students engaged for the long run. Anyone who has taught online knows this: one click away is social media, games, or distractions that can pull attention elsewhere. Motivation, self-regulation, even the sense of belonging, all of these are harder to maintain online (Horna Li, & Seminario Unzueta, 2023). The so-called digital divide is another thorny issue: it is not just about having or not having a laptop, it is about the quality of internet, the stability of the connection, the ability of a family to support that learning process.

And to be honest, many times schools simply move the same old methods online. A static PowerPoint on a shiny platform is still a static PowerPoint. As Bicalho et al. (2023) argue, the real challenge is to use digital environments to rethink pedagogy, not to digitalize tradition.

That is why training teachers is so crucial. Without updated skills, the tools stay underused, and their potential for fostering creativity, collaboration, and problem-solving is wasted (Díaz Vera et al., 2021). In the end, VLEs are like musical instruments: powerful, versatile, capable of beauty, but only in the hands of someone who knows how to play them.

So yes, virtual environments open enormous doors for meaningful learning, but they are not a magic bullet. They demand critical thinking, careful design, and above all, an awareness of their limits. The next step is clear: bridge the digital divide, support teachers with real training, and design environments that do not just move old practices to new screens, but genuinely invite students to learn in richer, more interactive ways. Only then will VLEs be more than platforms. They will be authentic bridges to deeper learning.

Implementation and Advantages of Mil Aulas in Moodle

The strategies and resources used in the educational field aim to guide teaching actions towards the management of learning processes that are aligned with the students' interests and expectations, with the goal of generating real transformations and changes in their way of knowing, doing, and internalizing content for the achievement of meaningful learning. According to Moreno-Laje et al. (2024), the design of didactic strategies supported by e-learning platforms seeks to meet the student's needs from the perspective of an individualized, interactive, and participatory scheme to develop skills in areas of interest, even in critical points.

In this sense, the most widely used tool in education is Mil Aulas, which offers “multiple activities, such as quizzes, consultations, databases, chat, forums, surveys, lessons, workshops, tasks, labels, books, wikis, among other free resources that favor interaction with the content” (Moreno-Laje, 2024, p. 6728), proving highly useful in education. For their part, Maji-Chauca et al. (2024) consider that Mil Aulas tools facilitate the strengthening and development of scientific skills and promote creativity and innovation. It is ideal for creating interactive and flexible virtual environments with digital resources and activities that foster active, collaborative, and meaningful learning. Similarly, Granados Muñoz (2021) mentions that it is applicable to all fields of knowledge, offering students, based on their needs and interests, more dynamic, motivating, and personalized learning experiences.

It is important to note that the Moodle platform and Mil Aulas operate under a negotiation system that makes it attractive to both the provider and the user, offering it free of charge.

It also presents certain advantages and disadvantages, as shown in Table 1. For de Sousa (2024), “Mil Aulas is a virtual platform that allows the teacher to be at the forefront of ICT, in addition to obtaining meaningful learning, as students build knowledge alongside their tutor” (p. 8).

Table 1.
Implementation, Advantages, and Disadvantages of Mil Aulas in Moodle

Implementation	Advantages	Disadvantages
Account creation and virtual classroom	Free	Advertising
Administration and configuration	Ease of use	Technical limitations
Automation	Quick access	Focus on small projects
Educational use	Popularity and Moodle support	

Note. This table summarizes the main strengths and weaknesses identified in the use of Mil Aulas, highlighting its accessibility and ease of integration, while also recognizing technical and functional constraints.

Based on the information presented by the cited authors, it is understandable that the Moodle platform is the most widely used by designers of virtual environments, not only in the business area but also across all disciplines of knowledge, presenting an opportunity to adapt and apply it in the educational field due to its free usage, ease of access-management, and the availability of a suitable environment that helps strengthen and develop skills, given the important set of digital resources commonly used in the teaching-learning processes within active methodologies.

Materials and Methods

The research adopts a mixed approach (quantitative–qualitative) that allows for both measuring and interpreting data. It is structured through an applied design with descriptive depth, as it seeks to understand the characteristics of the phenomenon, situation, or population, and it is cross-sectional since it analyzes variables collected over a specific period of time. The purpose is to verify whether the proposed pedagogical intervention generates significant changes in students' academic performance. For this reason, a pedagogical knowledge test aligned with the curricular program was designed and validated, and it was administered to the same group of students at two points in time: before the implementation of the Mil Aulas educational tool (pretest) and after it (posttest).

In addition, a survey was administered to third-year students immediately after the use of the Mil Aulas platform. The instrument included items organized in a five-point Likert scale (1 = Strongly Disagree; 5 = Strongly Agree), aimed at exploring multiple dimensions of the user experience: collaboration in activities, integration of technology, adaptability of the environment, speed of access, ease of navigation, connection between theory and practice, perceived academic improvement, and transfer of learning to different contexts. The survey allowed the collection of students' perceptions and levels of satisfaction to complement the quantitative results of the intervention.

For data processing, descriptive statistics (mean, median, and standard deviation) were first calculated for each item in the test and the questionnaire, mapping central tendencies and dispersion of responses. Subsequently, paired-samples t-tests were applied to compare pretest and posttest scores and to determine the statistical significance of the observed differences. All statistical analyses were performed using SPSS v.26.0, ensuring compliance with assumptions of normality and homogeneity of variance.

Population and Sample

The study population consisted of the 90 students enrolled in the third year of secondary education at Colegio de Bachillerato Tonchigüe, located in Atacames, Esmeraldas, Ecuador. Since the entire population was included, the study corresponds to a census, ensuring that the findings reflect the full group under study. To safeguard ethical standards, informed consent was obtained from both the students and their legal guardians, guaranteeing voluntary participation, confidentiality of responses, and adherence to research integrity principles for studies involving minors.

Theoretical Explanation

The study takes place over a five-week period, with a total of 10 hours of classes. In the first three weeks, the teacher applies the traditional methodology to teach the basic concepts. The students use the textbook provided by the Ministry of Education of Ecuador, covering the following content:

- **Week 1**: Market segmentation and the variables that make it up;
- **Week 2**: Advertising techniques and the creation of a commercial advertising plan;
- **Week 3**: Aspects related to safety and health within an entrepreneurship, and the pretest is applied. This initial evaluation determines the students' prior knowledge regarding the topics covered, guiding the teaching and learning process.
- **Weeks 4 and 5**: The use of the Mil Aulas platform, which is structured with interactive activities, digital resources, and formative assessments that reinforce the previously covered content, promoting a more active and participatory learning approach by the students (see Table 2). On the other hand, in the fifth week, the posttest is applied to evaluate the learning achieved at the end of the instructional process.

Table 2.
Structure of the Mil Aulas Platform Used During the Fourth and Fifth Weeks

Section	Content / Activity	Explanation
General Topic	The market and advertising	Central theme guiding the development of activities. Introduces students to market analysis and advertising strategies.
Unit Introduction	Introductory video from YouTube on digital advertising	An audiovisual resource is used to capture attention and contextualize the topic from a current perspective.
Doubt Forum	Open space for students to express their questions	Encourages active participation, critical thinking, and collaborative problem-solving.
Discussion Forum	Guiding question: What reasons would make you agree to start an entrepreneurship?	Stimulates personal reflection on entrepreneurship, linking learned concepts with real-life experiences and aspirations.
Topic Explanation	Conceptual development of content related to market, segmentation, advertising, and entrepreneurship.	Provides the theoretical foundation needed to understand and apply the topics.
Resources	Tab with explanatory videos for each subtopic and space to create a glossary.	Reinforces autonomous learning and promotes the creation of a glossary as a study tool.
Activities	Practical exercises applied to the student's environment.	Allows the concrete application of theoretical knowledge, developing practical skills.
Final Product	An entrepreneurship uses Suma CRM, an online service, to manage its sales force negotiations.	Evaluates the practical application of the learned concepts.
Summative Evaluation	Test covering content discussed during the five weeks. TOP 10 CRM Gratuito | Mejores Sistemas CRM Gratis 2025	Assesses the level of understanding and ownership of the content by the students.
Feedback (Games)	Interactive activities to reinforce learning: Desafío de emprendimiento y mercado – Educaplay Liveworksheet – Emprendimiento	Helps consolidate knowledge in a dynamic and interactive way, integrating games as a pedagogical strategy.

Note: This structure summarizes the activities implemented during weeks four and five, combining theory, practice, and gamified resources to promote meaningful learning in Entrepreneurship and Management.

The proposal is implemented through the Mil Aulas virtual learning environment, a digital educational platform structured with a dynamic and interactive instructional design. This tool enables the progressive sequencing of content, promoting active student participation through multimedia resources, collaborative forums, and evaluative activities. Below is the QR code that directly links to the access to the platform.

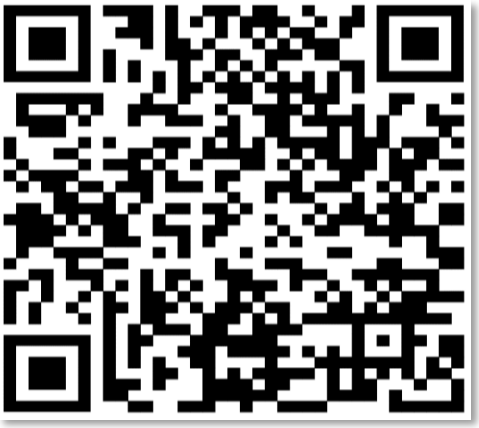

Figure 1. QR Code to Access the Mil Aulas Platform: The Market and Advertising
Note: To enter, use the following credentials: username **admin** and password **1305966044Israel**.

This improvement proposal has been validated by five experts: two in pedagogy, two in technology, and one in the subject of Entrepreneurship and Management. The validation considered the indicators of clarity, coherence, relevance, and pertinence across the 18 aspects involved in the development of the proposal, with 100% approval.

Results

Comparison of Posttest and Pretest Pedagogical Test Results

The results show a consistent increase in the means of the groups evaluated before and after the intervention (see Table 6). In parallel A, the mean increased from 4.59 to 9.00; in parallel B, from 5.08 to 9.68; in parallel C, from 5.01 to 9.35; and in parallel D, from 4.83 to 9.07. Additionally, in all cases, both the median and mode increased, which reinforces the trend towards a generalized improvement in student performance. The standard deviations were reduced in most cases, suggesting greater homogeneity in the results after the intervention.

Table 3.
Descriptive Statistics of the Pretest and Posttest

N	Mean	Median	Mode	SD	Min	Max
Before A	25	4.59	5.00	5.00	1.445	2.00
After A	25	9.00	9.00	9.00	0.645	8.00
Before B	25	5.08	5.00	5.00	1.305	3.00
After B	25	9.68	10.00	10.00	0.424	9.00
Before C	20	5.01	5.65	3.00	1.751	2.00
After C	20	9.35	9.50	10.00	0.714	8.00
Before D	20	4.83	5.00	5.00	1.590	2.00
After D	20	9.07	9.00	9.00	0.673	8.00

Hypothesis Testing

- **Null Hypothesis (H_0):** $\mu = 0$. There is no significant difference between the means before and after the intervention (the improvement is null or random).
- **Alternative Hypothesis (H_a):** $\mu \neq 0$. There is a significant difference between the means before and after the intervention (there is a real improvement in learning).

Table 4.
T-test for Paired Samples

			T-Statistic	df	p-value
Before A	After A	Student's T	-14.64	24.0	< .001
Before B	After B	Student's T	-17.10	24.0	< .001
Before C	After C	Student's T	-9.79	19.0	< .001
Before D	After D	Student's T	-10.58	19.0	< .001

Note: H_a μ Measure 1 - Measure 2 ≠ 0

The results of the paired samples T-test show statistically significant differences between the scores before and after the intervention in all the analyzed groups. In all four cases (A, B, C, and D), the T-statistic values are high and negative, indicating a consistent improvement in the post-intervention scores. Moreover, the p-values < .001 in all groups confirm that the observed differences are not due to chance. Therefore, the null hypothesis is rejected, and the alternative hypothesis is accepted: there is a significant change in student performance following the intervention.

Survey Results from Students

The results obtained from the Likert-type questionnaires applied to the third-year students of the General Unified Baccalaureate at Colegio de Bachillerato Tonchigüe are presented below:

Table 5.
Likert-type Questionnaire Propositions: Item 1, Item 2, and Item 3

Propositions	The tools in virtual environments promote active collaboration	The inclusion of technology in education improves learning	The implementation of a virtual environment in Mil Aulas improves learning
Strongly Disagree	1	0	0
Disagree	3	0	1
Neither Agree nor Disagree	15	13	23
Agree	53	38	45
Strongly Agree	18	39	21
Total	90	90	90

Source: Data taken from third-year students at Colegio de Bachillerato Tonchigüe (2025).

The results in Table 5 show a positive trend regarding the use of technological tools and virtual environments, particularly the Mil Aulas platform. In Item 1, related to active collaboration fostered by virtual tools, 53 students agreed, 18 strongly agreed, and 15 were neutral, indicating that the majority believes virtual tools facilitate interaction and collaborative work. Item 2, related to the improvement of learning through the inclusion of technology, also presents a favorable response, with 39 students strongly agreeing, 38 agreeing, and 13 being neutral, reflecting a positive perception about the influence of technology on academic performance.

In Item 3, which evaluates the implementation of a virtual environment in Mil Aulas, 45 students agreed, 21 strongly agreed, and 23 were neutral. These results suggest that the majority value the benefits of Mil Aulas, although a significant group of students still have reservations or do not fully perceive the improvement in their learning. The analysis of this data leads to the conclusion that, overall, students appreciate digital tools and virtual platforms as learning facilitators, although some may need more time or adjustments in using the platform to fully experience these benefits.

Table 6.
Likert-type Questionnaire Propositions: Item 4, Item 5, and Item 6

Propositions	Mil Aulas allow adapting activities according to needs	Mil Aulas allow finding information and resources quickly	Resources and activities in Mil Aulas are intuitive
Strongly Disagree	0	0	0
Disagree	3	1	1
Neither Agree nor Disagree	21	13	17
Agree	48	56	58
Strongly Agree	18	20	14
Total	90	90	90

Source: Data taken from third-year students at Colegio de Bachillerato Tonchigüe (2025).

In Table 6, the results show a mostly positive evaluation regarding the functionalities of Mil Aulas. For Item 4 on whether Mil Aulas allows adapting activities according to needs, 18 students strongly agreed, 48 agreed, and 21 were neutral, indicating that most students believe the platform facilitates adequate personalization of activities. In Item 5, on the speed of finding information and resources in Mil Aulas, 20 students strongly agreed, 56 agreed, and 13 were neutral, highlighting the accessibility of resources on the platform. Finally, in Item 6 regarding the intuitiveness of the resources and activities in Mil Aulas, 14 students strongly agreed, 58 agreed, and 17 were neutral, reflecting that most students find the platform easy to use.

Overall, the results suggest that the Mil Aulas platform is well-received by students, who positively value its ability to adapt to their needs, facilitate access to resources, and offer an intuitive interface. However, there is a 19% who remain neutral or disagree, indicating areas where the experience or customization of the platform needs improvement.

Table 7.
Likert-type Questionnaire Propositions: Item 7, Item 8, and Item 9

Propositions	In the Mil Aulas platform, synchronous and asynchronous activities can be done	The Mil Aulas platform facilitates the learning of entrepreneurship and management	It links the concepts, skills, and competencies learned in entrepreneurship and management
Strongly Disagree	1	0	0
Disagree	2	2	1
Neither Agree nor Disagree	20	7	17
Agree	47	55	58
Strongly Agree	20	26	14
Total	90	90	90

Source: Data taken from third-year students at Colegio de Bachillerato Tonchigüe (2025).

Regarding Table 7, Item 7 shows that when performing synchronous and asynchronous activities, the majority of students (47 agreed and 20 strongly agreed) believe the platform provides adequate flexibility in the learning mode. Moreover, in Item 8, most students also perceive that the platform facilitates the learning of entrepreneurship and management, with 55 students agreeing and 26 strongly agreeing, highlighting the effectiveness of the tool in supporting this specific area.

For Item 9, which evaluates the linking of concepts, skills, and competencies learned in entrepreneurship and management, the platform also received a positive evaluation, with 58 students agreeing and 14 strongly agreeing. These results indicate that students feel Mil Aulas significantly contributes to integrating what has been learned with practice. However, despite the 80% positive perception, 20% remain neutral or disagree, suggesting that there are still areas that need improvement to optimize the learning experience on the platform.

Table 8.
Likert-type Questionnaire Propositions: Item 10, Item 11, Item 12, and Item 13

Propositions	The activities of the proposal in the Mil Aulas virtual environment improve academic performance	They apply what they learned in the virtual environment in contexts outside the educational environment	The Mil Aulas virtual environment stimulates interest by promoting research and meaningful learning	Technological tools in the educational field are fundamental at Colegio de Bachillerato Tonchigüe
Strongly Disagree	0	2	1	0
Disagree	3	3	1	2
Neither Agree nor Disagree	15	15	16	10
Agree	51	44	48	32
Strongly Agree	21	26	24	46
Total	90	90	90	90

Source: Data taken from third-year students at Colegio de Bachillerato Tonchigüe (2025).

For Item 10, regarding whether the activities in Mil Aulas improve academic performance, the majority of students (51 agreed, 21 strongly agreed) consider that these activities have a positive effect on their performance. Similarly, in Item 11, a significant number of students (44 agreed, 26 strongly agreed) agree that what they learned in the virtual environment can be applied in contexts outside the educational field. Regarding Item 12, which evaluates whether Mil Aulas stimulates interest by promoting research and meaningful learning, 48 students agreed and 24 strongly agreed, indicating that the platform motivates interest and curiosity for deeper learning. Finally, in Item 13, related to the importance of technological tools at Colegio de Bachillerato Tonchigüe, 32 students agreed and 46 strongly agreed, reflecting that technology is necessary for learning.

In general, the results reveal a positive evaluation of Mil Aulas as a tool that improves academic performance, encourages the practical application of knowledge, stimulates research, and fosters meaningful learning. However, 13% of students remain neutral or disagree with some of the items, suggesting that there are areas of the platform that need improvement to ensure that all students benefit equally.

Discussion.

The triangulation between the theoretical framework, the educational reality, and the proposed solution through the Mil Aulas tool highlights how technological mediation transforms the teaching-learning process. From the socioconstructivist paradigm, meaningful learning is achieved when the student actively constructs knowledge by articulating previous experiences with new contextualized situations (Miranda-Núñez, 2022). This approach is particularly relevant in subjects such as Entrepreneurship and Management, where academic knowledge must be integrated with practical skills.

The educational reality at the General Unified Baccalaureate level shows that many students have difficulty transferring theoretical knowledge to real-life contexts. In this sense, the use of digital platforms like Mil Aulas provides a flexible, participatory, and personalized environment, addressing the diversity of learning styles and paces (Lino-Calle et al., 2023). The incorporation of interactive resources, such as discussion forums, audiovisual materials, and educational games, appears to have had the greatest impact. Forums encouraged students to exchange perspectives, strengthening collaborative learning. Videos provided accessible explanations that complemented the textbook, while gamified activities-maintained motivation and transformed routine tasks into engaging challenges. These elements help explain why students reported higher levels of satisfaction and performance.

From the pedagogical intervention perspective, a mixed strategy was developed in two phases: the first with the traditional approach based on the school textbook, and the second supported by the Mil Aulas environment with its digital resources and evaluative activities. This transition reflects what Moreno-Laje et al. (2024) argue: digital environments foster creative thinking, problem-solving, and

learning autonomy. The clear improvement in test scores suggests that the dynamic sequencing of content and the variety of activities offered through Mil Aulas allowed students to better connect theory with practice.

The instructional design included logical sequencing of content, use of relevant digital resources, and the application of a posttest evaluation. According to Andrade et al. (2023), virtual environments that integrate meaningful, collaborative, and contextualized activities enhance knowledge transfer. In this study, the combination of pretest–posttest comparisons with participatory activities confirmed that students not only improved academically but also developed transferable skills relevant to the workplace.

The survey results also provide insights into how students perceived the platform. In Items 1, 2, and 3, they highlighted the role of digital tools in strengthening collaboration and academic performance. This supports Bell et al. (2024), who stress that horizontal interaction and shared knowledge construction are fundamental for active learning. However, a significant proportion of students responded "neither agree nor disagree," which suggests that not all students fully experienced these benefits. This neutrality may indicate that some learners require more time, support, or adaptation of activities to take full advantage of the platform.

Similarly, Items 4, 5, and 6 revealed positive perceptions of task adaptability, ease of access, and intuitive design, aligning with the technology acceptance model (Pinargote et al., 2024). Still, around 19% of responses were neutral or negative, pointing to areas of improvement in personalization and user experience. These findings highlight that while Mil Aulas is generally well-received, continuous refinement is necessary to ensure inclusivity and engagement for all students.

Finally, Items 7 to 13 showed strong support for Mil Aulas in terms of promoting synchronous and asynchronous learning, stimulating research interest, and consolidating competencies in entrepreneurship and management (Manotoa-Labre et al., 2025). Nevertheless, it is important to acknowledge the limitations of this study. The intervention lasted only five weeks, which may not be enough to measure long-term learning consolidation. Furthermore, the context was limited to one institution, making it necessary to replicate the study in other schools and curricular areas.

In summary, the results confirm the potential of Mil Aulas to improve meaningful learning by combining interactive, collaborative, and gamified strategies. However, the presence of neutral responses, the short intervention period, and the contextual limits of the study indicate that future research should deepen the analysis of student diversity, expand the timeframe, and explore strategies to maximize engagement for all learners.

Conclusions

The use of the Mil Aulas tool has proven to be an effective resource for strengthening students' understanding of market dynamics and advertising practices. It fosters both conceptual and procedural skills through a learning experience that is collaborative, flexible, participatory, and motivating. Its accessibility from any environment with internet connectivity further expands its value, showing that digital tools can transcend the limits of traditional classrooms. The evidence obtained in this study demonstrates that the proposed didactic strategy effectively raises the level of meaningful learning in this curricular area.

With respect to the variable "Implementation and Advantages of Mil Aulas in Moodle," the Hebegogic approach fostered high levels of engagement, with more than 90% of students actively participating in activities. This promoted the consolidation of core content on market and advertising within the Entrepreneurship and Management unit of the third-year General Unified Baccalaureate (BGU). Moreover, the digital environment helped address long-standing teaching challenges, making the integration of ICT more natural and functional. The activities designed encouraged students to take ownership of their learning process through collaboration, reflection, and responsibility, both in synchronous and asynchronous sessions.

Concerning the variable "Meaningful Learning in Virtual Environments," students recognized the broad applicability and practicality of Mil Aulas as a didactic mediator. The experience not only reinforced the program contents but also demonstrated the sustainability and feasibility of incorporating virtual platforms in formal education. These findings highlight that the effectiveness of Mil Aulas lies in its capacity to

combine innovation with pedagogical consistency, ensuring that students experience learning as a dynamic and contextualized process.

The pilot study confirmed improvements in the competencies acquired. The application of digital skills enhanced academic performance while also transferring to professional contexts. This dual impact shows an evident growth in both digital and professional abilities, preparing students with a more versatile profile to face the challenges of the current labor market. Nevertheless, this study also opens new questions: What would be the long-term impact of continuous use of Mil Aulas on learning outcomes? Could similar results be obtained in other curricular areas beyond Entrepreneurship and Management? And to what extent can these platforms contribute to reducing educational inequalities in diverse contexts? These questions point to future research directions that would enrich the field and provide greater originality to studies on virtual learning environments.

Beyond the specific findings, this research contributes to the broader debate on how emerging technologies can reshape educational practices in Ecuador and Latin America. While Moodle and Mil Aulas are widely known, their contextualized application in the BGU demonstrates that, when properly designed, virtual learning environments can become instruments for equity, inclusion, and educational innovation. By situating this study in a local context while connecting it to global debates, the article offers insights not only for immediate implementation but also for the long-term rethinking of how digital platforms can transform teaching and learning in diverse educational systems.

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