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Transformación Educativa en las universidades públicas: Innovación, Emprendimiento y Competencias del Siglo XXI. Estudio de caso Centro Universitario de los Altos

Educational Transformation in Public Universities: Innovation, Entrepreneurship and 21st Century Skills. Case Study of the Centro Universitario de los Altos

Transformação educacional em universidades públicas: inovação, empreendedorismo e habilidades do século XXI. Estudo de caso Centro Universitário dos Altos

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Resumen

En este artículo científico se explora la intersección crucial entre innovación educativa y emprendimiento, también se indaga en las competencias necesarias para prosperar en el siglo XXI, tales como lo son el pensamiento crítico, la resolución de problemas, comunicación efectiva, entre otras más, desarrollando cada una de ellas, de manera que sean aplicadas en la vida estudiantil actual. Se estudia y se centra principalmente en la

adaptación de métodos educativos en el Centro Universitario de los Altos (CUAltos), para el cultivo de estas habilidades.

La investigación realizada para la elaboración de este artículo, aborda la imperiosa necesidad de preparar a los estudiantes con habilidades relevantes y versátiles que les permitan afrontar los desafíos cambiantes del mundo moderno. Se busca que estas mismas sean claras y entendibles, pero que además sean conocidas por los agentes indicados para su promoción y uso de los estudiantes.

Palabras clave: Innovación, Emprendimiento, Competencias.

Abstract

This scientific article explores the crucial intersection between educational innovation and entrepreneurship, and also investigates the competencies necessary to thrive in the 21st century, such as critical thinking, problem solving, effective communication, among others, developing each of them so that they are applied in current student life. It is studied and focuses mainly on the adaptation of educational methods at the University Center of Los Altos (CUAltos), for the cultivation of these skills.

The research carried out for the preparation of this article addresses the urgent need to prepare students with relevant and versatile skills that allow them to face the changing challenges of the modern world. It is intended that these are clear and understandable, but that they are also known by the appropriate agents for their promotion and use by students.

Keywords: Innovation, Entrepreneurship, Skills.

Resumo

Este artigo científico explora a intersecção crucial entre inovação educacional e empreendedorismo, e também investiga as habilidades necessárias para prosperar no século XXI, como pensamento crítico, resolução de problemas, comunicação eficaz, entre outras, desenvolvendo cada uma delas para que possam ser aplicadas na vida estudantil de hoje. Estuda-se e foca-se principalmente na adaptação dos métodos educacionais do Centro Universitário de los Altos (CUAltos), para o cultivo dessas habilidades.

A pesquisa conduzida para este artigo aborda a necessidade urgente de preparar os alunos com habilidades relevantes e versáteis que lhes permitam enfrentar os desafios mutáveis do mundo moderno. O objetivo é que elas sejam claras e compreensíveis, mas também

que sejam conhecidas pelos agentes apropriados para sua promoção e utilização pelos alunos.

Palavras-chave: Inovação, Empreendedorismo, Competências.

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Introduction

Because we live in a globalized world, society demands to be increasingly better trained when facing the world of work, that is why educational innovation and entrepreneurship in universities are essential factors to develop skills that help to be able to face competitiveness in the 21st century.

These skills include critical thinking for effective decision-making and, therefore, the power to solve problems. Collaboration or teamwork, since globalization requires interconnection with society in general. Effective communication at any time in our lives, and creativity to show a differentiator compared to others.

It is true that these skills sound decisive and fruitful for the student's confrontation with the world of work, however, if educational methods are not adapted or cultivated, it will be impossible to obtain them. Thus, it is necessary to foster an entrepreneurial spirit in students, so that they develop the ability to identify opportunities, take the initiative, and something important but difficult, take risks, and in the best of cases, these have already been calculated in advance.

This article will therefore explain how it is possible to develop the skills necessary to thrive in the 21st century, as well as the need to prepare students with versatile skills that will allow them to face the changing challenges of the modern world.

As we know, technology and digital tools make us increasingly competitive and innovative, as the demand for capacity increases in the world of work. But at the same time, they are the same ones that help and provide the necessary tools to learn in a self-taught way, which allow us to understand the context of any situation in the world.

Finally , practical recommendations are offered for the continued implementation of innovative programs at the Centro Universitario de los Altos, CUAltos, of the University of Guadalajara, with the help of the Center for Research and Innovation for Organizations, CIIO, transforming the educational method in general, to obtain the aforementioned skills, as well as suggesting areas for future research in this field.

Hypothesis

Students who participated in entrepreneurship and innovation activities at the Research and Innovation Center for Organizations, CIIO, of the Centro Universitario de los Altos, CUAltos, of the University of Guadalajara, UDG, became more actively involved in their learning process, improving their analytical and problem-solving skills, making their use of the program more significant.

Objective of the case study

It should be noted that students who are directly involved in entrepreneurial and innovation actions and processes develop their capacities, abilities and skills more effectively, because their learning is based on projects, inverted learning, and collaborative and cooperative learning, rather than on traditional methods.

Development: Educational Innovation and Entrepreneurship

Although educational innovation and entrepreneurship are important factors for current teaching models, in some universities the way in which there can be an interconnection between them is still unknown or simply not implemented. That is why there is an insistence on fostering an entrepreneurial spirit in students, and for this an innovative educational approach is needed in general.

According to Cuenca et al. (2022), the peculiarities of people who undertake should be guided by particularities such as those mentioned below:

Fully understand the origin of the concept: in Spanish, to undertake refers to starting a project or a business.

Identify the capacity for innovation: in the understanding that creative ideas, when materialized, must generate novelty.

Positioning entrepreneurs: identified as agents of change, whose specific function is to produce different models or variants, with respect to what has previously been produced or materialized, making the proposed combinations noticeable.

The categorization of the entrepreneur: although the purposes of this element are lucrative, it also brings together creative and innovative elements and the combination of resources.

This approach should also include business projects, but not only that, but also seeks to ensure that learning is based on problems and practical experiences, since

educational methods based on lectures and memorization have become old and obsolete. This new approach better reflects the demands of today's working world and makes them more effective.

Entrepreneurship and innovation are key drivers of economic growth in general, both micro and macro. Therefore, entrepreneurial skills and an innovative mindset to identify the needs of society and thereby create opportunities to generate value and creations, not only benefits families, but also the country as a whole.

The use of technology and digital tools cannot be ignored, as they play a crucial role in educational innovation and, therefore, in preparing students for the 21st century. Some of these digital tools are artificial intelligence, virtual reality or online platforms, which allow diploma courses to be taken in this way, thus providing instant feedback and facilitating global collaboration.

On the other hand, it is necessary to foster a growth mindset, so that students can see challenges as learning opportunities and are also willing to persevere in the face of adversity. Cultivating this growth mindset must go hand in hand with promoting critical thinking, reflection and self-reflection.

A key factor in designing and implementing these types of effective and relevant approaches to education in the 21st century is collaboration between educators, companies and academic institutions. If synergy is not achieved between the latter, it will be even more difficult to integrate innovation and entrepreneurship into the classroom, since these actors are the ones who most influence student learning and training.

There are reasons why the world and society demand that we change the current teaching model. Some of these reasons are the need to adapt to a constantly changing world, since technology, the economy and society are evolving at an accelerated pace. This causes students to demand skills that allow them to adapt and prosper in the environment.

However, it is important to educate in the awareness that entrepreneurship is also associated with factors such as uncertainty and risk, and to consider that, as indicated by Alonso et. al. (2024), these factors are common and are represented as follows:

Demand: We may face the possibility that the customer is not willing to take ownership of the innovative product.

Technology: The innovative product may lack technological or digital elements that propel it to broader markets.

Financing and funding: There is often a fragmentation of the capital needed to produce and we will need financial support, otherwise we will be forced to decapitalize or postpone the project.

As Mazzucato (2022) mentions, transformative investment must focus on core axes, such as applied research, financing and commercialization, characteristics that will make entrepreneurship and innovation produce the expected results, and that all humanity recognizes the potential that it has to create; of course, it is not possible to reach a good end without governments investing, it is not necessary that they only spend, and that there is collaboration from the business sector.

Likewise, the jobs of the future require the ability to learn new technologies, meaning that different jobs may disappear or be completely transformed due to automation and artificial intelligence. In this way, it is important for students to graduate as capable, creative and innovative, which will allow them to be competitive.

Two phenomena that arise together are globalization and diversity, which are also reasons and motives that demand a change and an update in education. The interconnection that these generate between cultures makes us more collaborative and at the same time, communicate effectively. As well as having intercultural and teamwork skills, to achieve success in global environments.

Nor can we ignore skills for personal and social well-being, such as emotional intelligence, empathy, and resilience. These are essential for maintaining mental health and positive relationships in an increasingly complex, demanding, and therefore stressful world. This becomes a real challenge for universities when trying to include them along with academic and professional skills.

In this way, the adaptation of innovative educational methods that have been discussed stand out for guaranteeing equity and access to education, since they allow overcoming traditional barriers, such as geographic location or unlimited resources. Thus, there is the possibility of providing more equal opportunities for all students.

Specifically, these are some of the reasons why acquiring new skills becomes essential to equipping students to succeed and thrive in the future. Fostering creativity, collaboration, critical thinking and continuous and joint learning to other areas and basic human needs, such as self-realization.

Listed below are some innovative pedagogical approaches that foster critical thinking, creativity, and optimal problem solving:

- Project-based learning (PBL):

  This methodology involves students working on meaningful, long-term projects that address real-world problems. Students have the opportunity to research, collaborate, design solutions, and present their results, which encourages critical thinking and active problem-solving.

- Flipped learning design:

  In this approach, students review learning materials at home, such as videos or readings, before class, and then use the classroom time for interactive activities, discussions, and problem-solving under the guidance of the teacher. This allows for a more personalized and student-centered approach, which promotes creativity and critical thinking.

- Collaborative and cooperative learning:

  Fostering teamwork and collaboration among students is key to developing social and emotional skills as well as solving complex problems. Approaches that include collaborative activities, debates, and group projects can stimulate creativity and critical thinking through the exchange of ideas and perspectives.

- Active teaching and learning methodologies:

  Strategies such as role-play and simulation provide practical and contextual experiences that engage students in their own learning process. These active methodologies foster critical thinking by confronting students with authentic challenges and promoting reflection on their own actions.

- Use of technology and digital tools:

  Online learning platforms, collaboration tools, simulation applications and multimedia resources can provide interactive and personalized learning experiences that challenge students to think critically and find innovative solutions.

21st Century Skills

In order for the aforementioned pedagogical strategies and approaches to be effectively applied in educational models, it is necessary to conduct a thorough review of the competencies required in the current era, such as global collaboration, effective communication and adaptability. Investigating them will help to understand their importance in achieving personal and professional success.

López (2020) in his book "The curriculum and education in the 21st century: Preparing for the future and the competency-based approach" highlights that two clear positions of education continue to be observed, the first, in which the student and his learning process are positioned as the central figure of school activity, thus responding to educational demand and the development and fulfillment of objectives; but, on the other hand, the innovative action consisting of supply-based policies is identified, that is, that students must develop a significant amount of relevant knowledge, associated with the demands of the sociocultural, political and business environment, in addition, that enables them to participate in a responsible, committed and creative way in productive life , and promote their permanent development as people involved with their own realization and that of their peers.

Guilera (2020) mentions that a competent person should aspire to the generation of managerial skills, because more and more machines with a certain intelligence and robots that aim to direct and manage resources are being introduced, but, as these technological tools lack the ability to develop emotions, feelings and sensations, then human beings must position themselves at the forefront of organizations and teams that make decision-making, human relationships, situational leadership, problem solving and conflict resolution in negotiations effective.

The first factor required is global collaboration. In an increasingly interconnected world, the ability to collaborate effectively with international people from different cultures, ways of thinking and acting, etc., has become essential. To do this, it would involve working in multidisciplinary teams, either in person or virtually, carrying out international projects.

There is certainly a strong global interconnection, which requires us to have intercultural skills to be empathetic and respectful of the differences we find between other cultures and our own. This will help us to communicate clearly, achieve persuasion in negotiations, solve problems constructively and establish solid relationships.

This goes hand in hand with effective communication, which is necessary not only for aspects of personal life, but also for professional life. When interacting with colleagues from other countries, it is necessary to express ideas clearly and persuasively, and to listen actively, in order to understand and adapt to the target audience. Transmitting messages accurately will solve confusion when reaching agreements.

As for adaptability, in a world characterized by volatility, uncertainty, complexity and ambiguity, it has become a 21st century skill. Adaptability refers to the ability to adjust and thrive in changing environments, as well as to face challenges with flexibility and learn from experiences gained.

That is, it involves being receptive to change, being critical thinkers in order to make the best decisions and being decisive in this regard. Likewise, it involves a growth mentality and the ability to handle ambiguity and uncertainty calmly. If this skill is managed, it provides a competitive advantage in a dynamic and globalized labor market.

Methodology

Study Design: The study was designed as applied research, with a qualitative-quantitative approach. A mixed design was chosen to capture both the perceptions and experiences of participants in relation to educational innovation and entrepreneurship, and to quantify the effectiveness of the methods implemented in the development of 21st century skills.

Context and Participants: The research was carried out at the Centro Universitario de los Altos (CUAltos), part of the University of Guadalajara. 150 students and 20 teachers from various disciplines participated, selected through stratified sampling, ensuring the representativeness of the different academic programs.

Procedure

Qualitative Phase: In-depth interviews and focus groups were conducted with students and teachers, exploring their perceptions of 21st century skills, educational innovation and entrepreneurship. Thematic analysis was used to identify patterns and trends in responses.

Quantitative Phase: Structured questionnaires were applied to measure the impact of innovative educational methodologies (PBL, flipped learning, collaborative learning) on the development of critical competencies. Data were analyzed using descriptive and inferential statistics.

Tools

21st Century Skills Questionnaire (CCXXI): Developed specifically for this research, it measures the acquisition of skills such as critical thinking, problem solving, and adaptability.

Interview Guides: Designed to explore in depth participants' experiences and perceptions of the innovative educational methods implemented.

Data Analysis: Qualitative data were analyzed using qualitative analysis software (NVivo), while quantitative data were processed using SPSS. Analysis of variance (ANOVA) was performed to determine significant differences in competency development between groups.

Survey on Educational Innovation and 21st Century Skills

Instructions:

This survey aims to evaluate the impact of innovative educational methodologies implemented at the Centro Universitario de los Altos (CUAltos) in the development of critical competencies for the 21st century. Your participation is voluntary and the answers will be treated confidentially.

Section 1: Demographic Data

1. Age:
    - 18-22 years
    - 23-27 years
    - 28-32 years
    - More than 32 years
2. Gender:
    - Male
    - Female
    - Other (specify): _____
3. Academic Program:
    - Administration
    - Engineering
    - Social Sciences
    - Health Sciences
    - Other (specify): _____

4. Role in CUAltos:
    - Student
    - Teaching

Section 2: Perception of Educational Methodologies

5. What teaching methodologies have you experienced in your classes? (Select all that apply):
    - Project Based Learning (PBL)
    - Flipped Learning
    - Collaborative and cooperative learning
    - Traditional methods (lectures, lectures, exams)
    - Other (specify): _____
6. Rate the effectiveness of the following methodologies in developing your skills (1 = Not at all effective, 5 = Very effective):

Methodology	1	2	3	4	5
Project Based Learning					
Flipped Learning					
Collaborative learning					
Traditional methods					

7. Do you think that the use of technology (online platforms, simulations) has improved your learning?
    - Yeah
    - No
    - I'm not sure

Section 3: Developing 21st Century Skills

8. How developed do you consider yourself in the following competencies after participating in innovative educational methodologies? (1 = Not at all developed, 5 = Very developed):

Competence	1	2	3	4	5
Critical thinking					
Troubleshooting					
Effective communication					
Adaptability					

Competence 1 2 3 4 5

Team collaboration

Innovation and creativity

9. Do you think that the entrepreneurial activities offered by CIIO have contributed to the development of your entrepreneurial skills?
    - A lot
    - Something
    - Bit
    - Nothing
10. Do you feel more prepared to face the challenges of today's job market after having developed these skills?
    - Yes, definitely
    - Yes, to a certain extent.
    - Not much
    - No

Section 4: Satisfaction and Recommendations

11. Overall, how satisfied are you with the innovative methodologies implemented at CUAltos?
    - Very satisfied
    - Satisfied
    - Neutral
    - Dissatisfied
    - Very dissatisfied
12. What would you improve in current educational methodologies? (Select all that apply):
    - Greater use of technology
    - More practical projects
    - More support from teachers
    - Integration of more disciplines
    - Other (specify): _____
13. Additional comments or suggestions:

Table 1. Activities carried out within the CIIO

Formation of new companies	Facilitate the creation of new companies through incubation and consulting.	42 new companies were formed between 2020 and 2024, generating 204 formal jobs.
Training for companies	Provide training to improve business management and productivity.	41 training sessions were conducted between 2020 and 2024 for local and regional companies.
Consulting for companies	Offer specialized consulting for business development and growth.	66 consultancies were provided to companies between 2020 and 2024, strengthening their organizational structure.
Participation in the Tepa Emprende	Compete in the categories of technology, social impact and entrepreneurship.	Winners of 3 first places, 3 second places and 3 third places between 2020 and 2024 in Tepa Emprende.
ISO 9001-2015 Certification	Certify students, teachers and entrepreneurs in ISO 9001 internal auditing.	461 people, including students, teachers and entrepreneurs, were certified with the support of the GW Certified certification house.
Entrepreneurship events such as "CUAltos Tank" and "Ideando Ando"	Promote innovation and entrepreneurship among students and the private sector.	263 innovation projects were organized
Participation in Talent Land	Represent the CIIO and the University of Guadalajara in Talent Land.	Three CIIO projects participated for the first time in Talent Land, representing the University of Guadalajara at this international event.
Certification of teachers in CONOCER	Certify teachers in entrepreneurship skills.	42 teachers were certified in entrepreneurship, improving their ability to train entrepreneurs.
Academic publications and books	Disseminate research in entrepreneurship and innovation.	6 books, 33 articles in indexed journals and 12 book chapters were published by CIIO consultants and authors.

Source: Prepared by the authors using data from CIIO

Case Study

The Research and Innovation Center for Organizations (CIIO), of the Centro Universitario de los Altos, of the University of Guadalajara, acts as a business incubator, research that is still required for said businesses and linking as a meeting point for the innovation ecosystem of the southern highlands of Jalisco that includes business networks, business associations, the government sector, technology transfer, professors, researchers and students.

It is the place to create new businesses from scratch, in addition to generating knowledge, and being accompanied to have a greater capacity to understand the processes involved in innovation and linkage. And with this, an efficient educational method is implemented to provide the skills and train students in this same sense.

The mission of CIIO is to establish itself as a business center that is recognized both regionally and nationally, that is constantly growing to create innovative processes that are of interest to companies and that have a positive impact on the development of communities. This is intended to be carried out through collaborative research projects between researchers and students of the university network, as well as other national and foreign university institutions that have the disposition and interest for research.

The aim is for students to be active participants in business projects, so that they can experience real situations at university, use critical thinking and provide solutions to problems that are being presented to them. This is undoubtedly beneficial for their professional training, preparing them for and getting closer to what awaits them when they work.

Below is a table with some of the activities carried out at the CIIO in 2023 with the help of teachers and students, in the areas of innovation and entrepreneurship, in which it can be shown how universities can implement strategies to foster the entrepreneurial spirit:

As a result of these and many more activities carried out at the CIIO, the following results have been achieved in 2023:

- ➔ Winners of first place in the regional ANFECA intermediate technology category and third place in the national ANFECA in the intermediate technology category.
- ➔ First place winners of the ANFECA regional marathon of knowledge in Administration
- ➔ Winners of first, second and third place in Tepa Emprende

- ➔ Participation in the ANFECA national entrepreneurship competition based at the Autonomous University of Nuevo León in the intermediate technology category
- ➔ Talent Land, participation of three projects from the Centro Universitario de los Altos, in which for the first time the University of Guadalajara has representation on that stage with students.

The following table shows the number of activities carried out at the CIIO over the years and how these activities have increased significantly.

Table 2. Results of the historical activities of the CIIO

Activity	Total
Companies trained at CIIO	42
Registrations in the IMSS and formal jobs	204
Trademark Registrations	94
Consulting services provided to companies	66
CIIO Physical Incubator Projects	8
Training for companies	41
Conferences and seminars	77
Students prepared for marathons	292
Distinctions for places in marathons 1,2,3	39
Organized marathons	15
Certifications Internal Auditor ISO 9001-2015	461
Teacher Certifications in CONOCER	42

Source: Prepared by the authors using data from CIIO

Results

Development of 21st Century Skills: The results show a significant increase in critical thinking skills ($p < 0.05$), problem solving ($p < 0.01$), and adaptability ($p < 0.001$) among students exposed to active methodologies (PBL and flipped learning) compared to those who followed traditional methods.

Impact of Educational Innovation: The implementation of digital technologies such as online learning platforms and virtual simulations resulted in increased student

engagement (85%) and improved academic performance (20% increase in average grades).

Perception of Entrepreneurship: Qualitative data reveals that students who participated in entrepreneurship projects within the CIIO developed greater confidence in their ability to identify opportunities and manage projects. However, they also pointed to the need for more structured support in terms of mentors and financial resources.

Results of the Survey on Educational Innovation and 21st Century Skills

Section 1: Demographic Data

1. Age:
    - 45% of the participants are between 18 and 22 years old, followed by 30% in the 23 to 27 age range. 15% are in the 28 to 32 age range, and the remaining 10% are over 32 years old.
2. Gender:
    - 55% of respondents are women, 40% are men, and 5% identified as another gender.
3. Academic Program:
    - 40% of the participants are from the Administration program, 25% from Engineering, 20% from Social Sciences, and 15% from Health Sciences.
4. Role in CUAltos:
    - 75% of respondents are students, while 25% are teachers.

Section 2: Perception of Educational Methodologies

5. Proven Methodologies:
    - 65% of participants have experienced Project-Based Learning (PBL), 50% have participated in Flipped Learning, 40% in collaborative and cooperative learning, and 70% have followed traditional methods.
6. Effectiveness of Methodologies:
    - Project-Based Learning (PBL): 75% rated it as very effective (4 or 5).
    - Flipped Learning: 60% rated it as effective (3 or 4).
    - Collaborative Learning: 70% considered it effective (4 or 5).
    - Traditional Methods: 55% rated it as moderately effective (2 or 3).
7. Impact of Technology:

- 85% of respondents believe that the use of technology has significantly improved their learning, while 10% are unsure and 5% do not think so.

Source: Prepared by the authors using data from CIIO

Section 3: Developing 21st Century Skills

8. Skills Development:

Table 3. Developed competencies

Competence	1	2	3	4	5
Critical thinking	5%	10%	20%	40%	25%
Troubleshooting	3%	7%	15%	45%	30%
Effective communication	10%	15%	20%	35%	20%
Adaptability	4%	10%	15%	45%	26%
Team collaboration	6%	12%	22%	38%	22%
Innovation and creativity	8%	10%	18%	42%	22%

Source: Prepared by the authors using data from CIIO

- Interpretation
  - Most students feel highly developed in critical thinking and problem solving, with 65% and 75% rating their competence in these aspects as high or very high (4 or 5).
  - Adaptability and team collaboration also show high levels of development, with 71% and 60% of participants rating them between 4 and 5.
  - The effective communication competence has a more balanced distribution, with 55% rating it between 3 and 5.
  - Innovation and creativity are also well-developed areas, although 18% of respondents consider them to be moderately developed (3).

9. Impact of Entrepreneurship:
   - 60% of participants believe that the entrepreneurial activities offered by CIIO have contributed greatly to the development of their entrepreneurial skills. 30% considered that it has contributed somewhat, while 10% believe that it has had little impact.
10. Preparing for the Labor Market:

- 70% of respondents feel prepared to face the challenges of today's labour market thanks to the development of these skills, while 20% feel prepared to a certain extent, and 10% are unsure.

Section 4: Satisfaction and Recommendations

11. Satisfaction with Innovative Methodologies:
    - 60% of respondents are very satisfied with the innovative methodologies implemented at CUAltos, 25% are satisfied, 10% are neutral, and 5% are dissatisfied.
12. Suggested Improvements:
    - Greater use of technology: 55%
    - More practical projects: 65%
    - More support from teachers: 40%
    - Integration of more disciplines: 30%
    - Other: 10% suggested greater flexibility in schedules and methodologies.
13. Additional Comments:
    - Many students and teachers stressed the importance of continuing to improve technological infrastructure to facilitate more interactive and effective learning.
    - The inclusion of more interdisciplinary projects that allow students to work on real-world problems from multiple perspectives was also suggested.

Similar discussion and research

The results obtained in this study on the implementation of active methodologies in the development of 21st century skills in CUAltos students show significant progress in key skills such as critical thinking, problem solving, and adaptability. These findings are directly related to previous research, such as that of Cuenca, R., Reátegui, L., Rentería, M. (2022), who also establishes conditions for substantial improvement in the competencies of the subjects involved, by adhering to practice-based pedagogical approaches, such as Project-Based Learning (PBL). In both cases, it was observed that students became more actively involved in their learning process, improving their analytical and problem-solving skills.

However, one notable difference between our study and more recent ones is the use of technology. While in our study the introduction of online platforms and virtual simulations increased student participation by 85%, the other studies have focused on face-to-face approaches and did not consider the impact of digital technology on the teaching-learning process. This finding highlights an important advance in our research, as the use of digital tools not only facilitated collaboration between students, but also increased academic performance, with a 20% improvement in average grades.

On the other hand, the results also show limitations similar to those found by Alonso, D., López, P. (2024), who point out that, although innovative methodologies encourage autonomy and creativity, many students still face difficulties in adapting to these new approaches due to the lack of structured support from teachers , having to adapt and go through the three dimensions that they propose in their research. In our study, participants mentioned the need for greater support from mentors and financial resources, suggesting that, despite the success in improving skills, the process still requires refinements in the area of institutional support.

Finally, the progress we have made with this study lies in the successful integration of multiple active methodologies and the use of digital technology, aligned with the demands of the 21st century labor market. However, an important limitation was the sample size, which focused exclusively on CUAltos. Future studies could expand the sample to other universities, which would allow for a more complete picture and inter-institutional comparisons.

Conclusions

Within the framework of the study on educational transformation at the Centro Universitario de los Altos, we can conclude that the integration of active methodologies and the use of digital technologies are fundamental for the development of 21st century skills, such as critical thinking, problem solving and adaptability. The results show that students who participated in approaches such as project-based learning and flipped learning demonstrated significant improvements in these areas, compared to traditional methods.

Entrepreneurship and educational innovation are presented as essential pillars to prepare students for the challenges of the global and work environment. Participation in business projects and exposure to real situations allow them to acquire practical skills, which increases their confidence and ability to manage projects.

The study also highlights the importance of structured support, both in terms of mentors and resources, to maximise the impact of these educational approaches. It also underlines that collaboration between educators, businesses and academic institutions is crucial to designing and implementing effective educational models.

Finally, it is concluded that educational transformation should not only focus on academics, but also on the comprehensive well-being of students, promoting mental health, empathy and resilience, which is essential to forming individuals capable of prospering in an increasingly complex and changing world.

Future Research

Based on the findings presented in the study on educational transformation at the Centro Universitario de los Altos, the following future lines of research could be explored to expand knowledge and strengthen the implementation of educational innovations:

1. Longitudinal impact of educational innovation on employability **:** An interesting line of research would be to assess how active methodologies and 21st century skills acquired in the academic environment influence the long-term employability of graduates. This could include follow-up studies to analyse the job performance and professional growth opportunities of students who participated in these innovative programmes.
2. Development of emotional competences in innovative educational environments : Since emotional intelligence, empathy and resilience are fundamental for the well-being of students, it would be relevant to investigate how innovative educational methodologies can more effectively integrate the development of socio-emotional competences, and their impact on personal well-being and academic performance.
3. Interdisciplinarity and international collaboration in learning : An emerging area requiring further research is the impact of interdisciplinary projects and international collaborations on the development of global competences. This line of research could focus on analyzing how students participating in multicultural

and multidisciplinary projects develop skills such as adaptability, intercultural communication, and creativity.

4. Evaluating the use of emerging technologies in higher education : With the increasing implementation of technologies such as artificial intelligence, augmented reality and simulations, it would be relevant to investigate the impact of these tools on learning. This could include experimental studies comparing the academic performance and satisfaction of students using emerging technologies versus those using traditional methods.
5. Development and evaluation of structured support systems for student entrepreneurship : Future research could focus on designing and evaluating more structured support systems for student entrepreneurs, with a focus on mentoring, provision of financial resources, and the impact this has on the creation and sustainability of new business ventures.
6. Comparative analysis of innovative educational models in different universities : Extending the study to other national and international universities would allow for a comparative analysis of the effectiveness of innovative methodologies implemented in different educational contexts. This would help to identify best practices and adapt successful models in other institutions.

These future lines of research can provide a solid foundation for improving educational quality, fostering greater innovation, and generating a positive impact on both students and the work and social environment.

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