

Original Article

Design and Implementation of an Interactive Educational Platform for the Teaching of Social Sciences in Primary Education in Peru: Facing Challenges and Fostering Student Understanding and Participation

Lida Asencios-Trujillo¹, Lucia Asencios-Trujillo², Carlos La-Rosa-Longobardi³, Djamila Gallegos-Espinoza⁴

^{1, 2, 3, 4}Graduate School, Enrique Guzmán y Valle National University of Education, Lima, Peru.

¹Corresponding Author : lascncios@uneedu.te

Received: 21 February 2024

Revised: 10 May 2024

Accepted: 21 July 2024

Published: 26 July 2024

Abstract - In this research work, the challenges inherent to the teaching of social sciences in primary education in Peru are addressed, including lack of understanding of concepts, cultural bullying, lack of motivation and academic pressure. To overcome these barriers, the design of an innovative educational platform that integrates technology to improve the learning experience of students is proposed. The platform will focus on offering interactive resources, multimedia content and playful activities, with the main objective of strengthening the understanding of key concepts in social sciences. In addition, it seeks to encourage student participation, creating a stimulating virtual environment adapted to the learning needs of primary school students. It is hoped that this initiative will not only address identified difficulties, such as lack of motivation and understanding but also enrich education through the effective use of technological tools. In summary, the project aspires to positively transform the educational experience of students, promoting civic values and strengthening their contribution to a democratic and pluralistic society through the implementation of an educational platform designed to optimize the teaching of social sciences in primary education.

Keywords - Educational design, Social sciences, Interactive platform, Student participation, Educational innovation.

1. Introduction

In Peru, social science courses are an integral part of the education system, addressing various disciplines that explore the complexity of society, its history, political structures, and cultural dynamics. These courses typically include subjects such as history, geography, economics, sociology, and citizenship, providing students with an in-depth understanding of the country's historical evolution, its geographical characteristics, the interaction between different social groups, as well as the fundamental principles of economics and citizen participation [1]. In addition, social science courses foster critical thinking, ethical reflection, and social awareness, equipping students with tools to analyze and understand contemporary challenges and actively contribute to the development of a more just and equitable society. These subjects not only seek to transmit knowledge but also to promote civic and civic values that strengthen the participation of students in the construction of a democratic and pluralistic society [2]. In the social studies course in primary education in Peru, students may face various challenges that affect their learning and well-being. Among these problems are difficulties in understanding social concepts, bullying related

to cultural aspects or ethnic differences, lack of motivation due to perceived little relevance in the subject, and socialization problems that may arise due to the diversity of family and cultural contexts [3] [4]. In addition, academic pressure in the study of historical events and socio-political concepts can lead to stress in students. It is critical to address these challenges holistically, fostering an inclusive educational environment and providing the support needed to overcome academic and emotional barriers [5] [6]. The integration of technology into social science education can significantly enrich student learning. Digital platforms and interactive multimedia resources offer dynamic visual experiences, such as interactive maps and educational videos, that facilitate the understanding of historical and geographical concepts. In addition, internet access provides students with a wide range of global information sources, allowing them to explore current events and gain international perspectives that enrich their knowledge in the social sciences [7]. Online learning platforms offer flexibility, allowing students to progress at their own pace and explore specific topics of interest. Likewise, educational games and playful applications turn learning into an engaging experience, addressing topics in a



fun way and motivating participation. Finally, virtual collaboration platforms facilitate interaction between students, promoting teamwork and discussion of socio-cultural issues in an accessible and efficient way. Taken together, these technological tools can significantly enhance the educational experience in the social sciences [8]. The main objective of the project is to design an innovative and effective educational platform with the purpose of improving the learning of social science courses in primary school students.

The educational platform will be specifically focused on providing interactive resources, multimedia content and playful activities that strengthen the understanding of key concepts in social sciences. In addition, it seeks to encourage student participation, offering a virtual environment that stimulates interest and exploration of historical, geographical and cultural topics in an attractive way and adapts to the learning needs of primary school students.

2. Related Work

The author [9] points out that the health crisis has highlighted the ability of certain technology service providers, especially digital platforms, to adapt and respond in an agile way to the supposed demands of the education system. This article discusses some of the tensions that have arisen due to the increase in the adoption of educational digital platforms, focusing on the school and family environment. Through a mixed methodological approach that included six detailed interviews with school principals and a survey applied to 2112 families, the perceptions of the school community and families about the use of digital educational platforms in public schools in Catalonia were examined. The results reveal conflicts associated with the "need" to adapt to a post-digital reality, where adopting critical positions, even if they are a minority, is perceived as a threat to freedom in professional practice and equitable access to education. At the same time, the role of teachers in fostering critical and reflective stances that allow them to question naturalized forms of work and interaction, both for them and for students, is highlighted.

On the other hand, the author [10] [11] states that the integration of gamification, based on the employment of technological resources, becomes increasingly imperative in learning sessions, especially in the potential context of distance education. This approach should address various areas of knowledge, including complex mathematics. The research aims to evaluate the impacts of mixed gamification on mathematical cognitive demand. Activities were carried out on educational platforms and video game competitions over six months, involving 300 students in the third and fourth grades of primary school ($M = 9.1$; $SD = 0.7$) distributed in experimental and control groups. The results indicate an increase in scores, indicating improvements in both the non-connective demand approach (with a moderate level of performance) and the connective demand approach (with a high level of performance). The conclusions suggest that the

combined effects derived from the use of technological resources for gamification have a positive impact on performance in mathematical cognitive demand. However, limitations are recognized and it is proposed to replicate the study with a prolonged implementation of gamified classes and the variation in the use of the games used in the experiment.

Likewise, the author [12] focuses on the fact that technological advances since the middle of the last century have been a determining factor for the growth of distance education. Systematization, accreditation, didactic supports, curricula, discussion forums and blogs, among others, contribute to the growing phenomenon of homeschooling, prompting families at the international and national levels to reconsider the proposals for compulsory face-to-face schooling, according to Exeni (2013). Homeschooling, facilitated by Information and Communication Technologies (ICT), is on the rise in several countries, including Mexico. This partial research aims to identify and analyze this educational practice worldwide and specifically in Mexico, focusing on a qualitative analysis of Virtual Learning Environments with Educational Platforms, as well as the sociocultural perspective of the families who use them at the Basic level of education.

In this way, the author [13] presents the key results of the project of the National Agency for Research and Innovation (ANII) entitled "New Statistical Technologies for the Evaluation and Monitoring of Educational Platforms". The project, funded from data from 2017, focuses on the evaluation of the use of the CREA educational platform. Its main objective is to analyze the behavior patterns of students by developing a web application and creating summarized indicators. These indicators allow the monitoring of the use of the CREA platform at various levels of analysis (class, grade, school, department) and at different points in time. The solution, implemented for mentors, teachers, principals and other actors in the education system, provides dynamic reports in a simple and systematized way. The project, developed entirely in R (computational statistics and graphics software), uses shiny, markdown and other packages. The educational monitor seeks to improve the quality of teaching by identifying students at risk of academic backwardness. In addition, the predictive capacity of the information generated in CREA with respect to the results of the adaptive test of the Ceibal program in English is analyzed using statistical learning methods. The accuracy of the predictive models is benefited by obtaining specific information on the use of the CREA platform in Ceibal's activities in English.

3. Methodology

3.1. Start

To ensure the effective completion of the project, we will implement the Scrum agile methodology. This approach provides several key benefits:

3.1.1. Develop an Intuitive Interface

The first specific objective is to design an educational platform with an intuitive and easy-to-use interface which adapts to the cognitive needs and abilities of primary school students. The aim is to facilitate navigation and access to educational resources.

3.1.2. Integrate Interactive Content

The second objective focuses on the integration of interactive and dynamic content related to social science courses. This includes elements such as educational videos, interactive maps, and playful activities that encourage student engagement and interest.

3.1.3. Personalize Learning

The aim is to design tools that allow the personalization of learning, considering the pace and learning style of each student. This involves adapting educational materials according to individual needs, thus promoting a more inclusive educational approach.

3.1.4. Facilitate Feedback

Another specific goal is to implement effective feedback mechanisms, both for students and educators. This will include formative assessments, progress tracking, and feedback that contributes to the ongoing development of learning in the social sciences.

3.1.5. Scope

The design of the educational platform will include the creation of specific modules for social science courses aimed at primary school students. The contents will be structured in an attractive and didactic way, with a focus on historical, geographical and social aspects relevant to their level of understanding.

The platform will allow educators to monitor student progress and tailor teaching to their needs. It is also intended that the platform be accessible from common devices used in school environments, thus promoting its implementation in various educational contexts. It should be noted that the platform will not completely replace classroom interactions but is conceived as a complementary resource to enrich the learning experience in social sciences.

3.1.6. Mathematical Reasoning

Develop a culture of logical reasoning and critical thinking. Encourage students to articulate their thought processes and consider multiple ways to solve problems.

3.1.7. Interactive and Enjoyable Lessons

Interactive and Enjoyable Lessons: Design interactive and enjoyable lessons to capture student interest. Incorporating games, puzzles, and hands-on activities can make mathematics learning enjoyable and stimulating [10] [14] [15].

Applying these principles enables educators to foster an effective learning environment that enhances a comprehensive understanding of mathematics and prepares students for future academic endeavors.

3.2. Elaboration

The system architecture for the educational platform aimed at improving the learning of social studies courses in primary school students should be robust and adaptable to specific educational needs. A general architecture is outlined below.

3.2.1. Intuitive User Interface

The system would feature an intuitive and engaging user interface designed for elementary school children. It should be easy to navigate and present the contents in a visually appealing way, using graphic elements, vivid colors, and a user-friendly design.

3.2.2 Interactive Content Modules

The platform would be composed of interactive content modules, including educational videos, didactic games, hands-on activities, and interactive maps. These modules would be structured around the specific social science themes of the primary curriculum.

3.2.3. Learning Personalization

Learning personalization tools would be implemented, allowing students to progress at their own pace and tailor content to their individual learning styles. These tools could also provide personalized content recommendations based on student performance and preferences.

3.2.4. Feedback System

The platform would incorporate a feedback system that would allow educators and students to receive detailed feedback on progress. This could include formative assessments, scoring, and performance analysis, as well as specific feedback on areas for improvement.

3.2.5. Cloud Architecture and Cross-Platform Accessibility

To ensure accessibility from diverse devices and locations, a cloud-based architecture would be used. This would allow students to access the platform from computers, tablets, or other devices with an internet connection.

3.2.6. Security and Privacy

Security measures would be implemented to protect user information, ensuring the privacy of student data. Security protocols would be put in place to prevent unauthorized access and protect the integrity of the platform.

3.3. Construction

Prototypes of what would be the educational platform have been designed, which is composed of the following modules.

3.3.1. Main Screen

The main screen shows the 4 modules that the web platform will have, which are the learning sessions, the assessments, the educational games and the grades, as shown in Figure 1.

3.3.2. Learning Sessions Module

It will be composed of 3 modules that, within the module, are the syllabus according to the student's grade, starting with a basic, intermediate and advanced level, as seen in Figure 2.

3.3.3. Questions or assessments

In this module you will find the evaluations of the different modules of the learning sessions, it is expected that through this module you can evaluate the knowledge of the students through the use of the platform to observe if it has improved as seen in Figure 3.

3.3.4. Educational Games

This module has been implemented so that students can play while learning; all the games implemented are educational, from putting together a puzzle with the cultures of the country to ordering the departments of the country, etc., as seen in Figure 4.



Fig. 1 Principal main

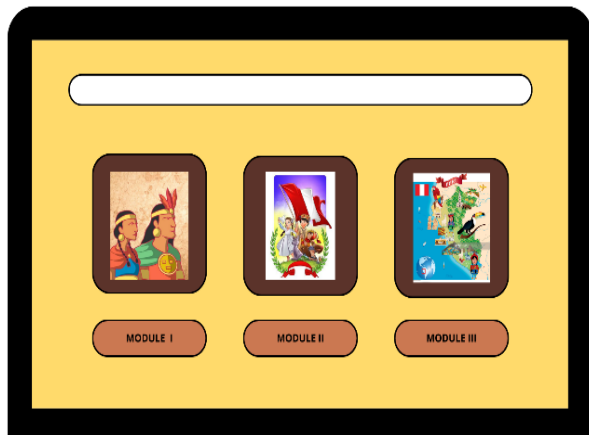


Fig. 2 Learning sessions module



Fig. 3 Questions

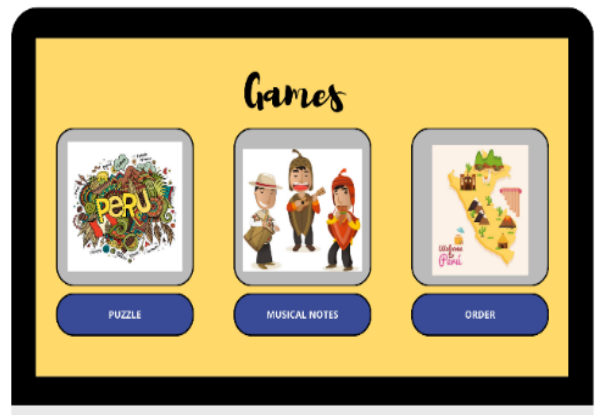


Fig. 4 Game

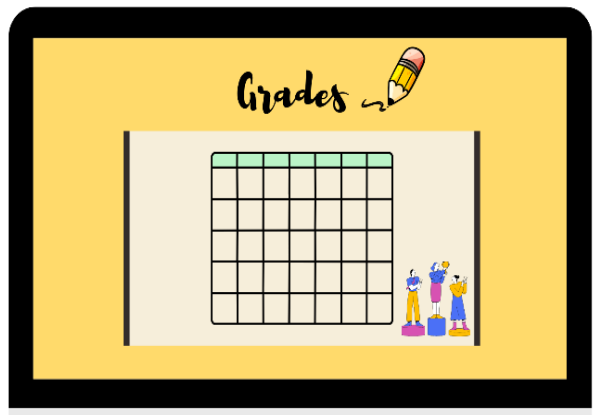


Fig. 5 Grades

3.3.5. Note

In this module, the students and teachers will be able to see the progress and grades of the students according to the evaluations that have been taken, and all this is for a better record of the grades of the evaluations, as seen in Figure 5.

3.4. Transition

A survey was carried out to 20 teachers from different educational institutions to find out what difficulties they have

in carrying out a traditional class and what benefits would be brought to them by implementing a web platform to improve the learning of primary school students; the questions are the following.

3.4.1. Difficulty in One-on-One Interaction

The question asked is: Which of the following best describes the difficulty you face in a traditional classroom to provide individualized attention to each student in the area of social sciences? Figure 6 shows the results, 5 teachers point out the lack of time to attend to each student, 5 difficulty in identifying the individual needs of the students and 10 the limitations in personalized educational resources.

3.4.2. Access to Up-to-Date Educational Resources

Which of the following best reflects the difficulty you experience in providing up-to-date and relevant social science material during traditional classes?. The results of this question can be seen in Figure 7, where 3 teachers indicate that the difficulty is the limitation in the availability of up-to-date textbooks. 2 that difficulty keeping up with changes in the curriculum and 15 that lack of access to modern educational technology.

3.4.3. Immediate Participation and Feedback

Which of the following best describes the difficulty you encounter in encouraging student engagement and providing immediate feedback in a traditional social studies class? In Figure 8, the results can be observed: 7 teachers indicate a decrease in student participation in classes, 5 delays in the feedback of tasks and evaluations and 8 in difficulty in assessing comprehension in real-time.

Which of the following options do you think would be the most significant benefit of implementing a web-based platform to improve learning in social sciences for elementary school students? Figure 9 shows the results, where 9 teachers indicated greater access to interactive multimedia resources, 5 personalized learning to suit different learning styles, and 6 facilitation online communication and collaboration.

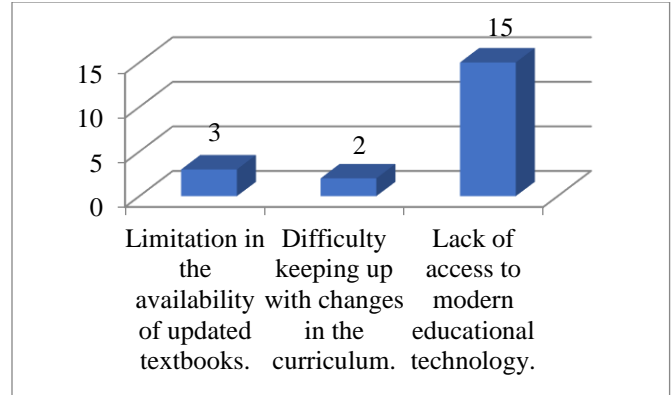


Fig. 7 Access to up-to-date educational resources

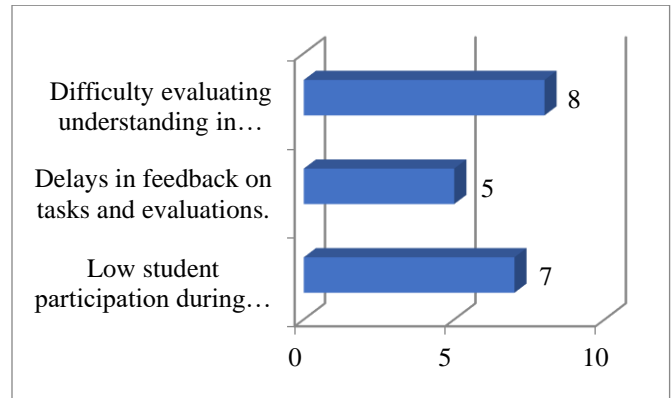


Fig. 8 Immediate engagement and feedback

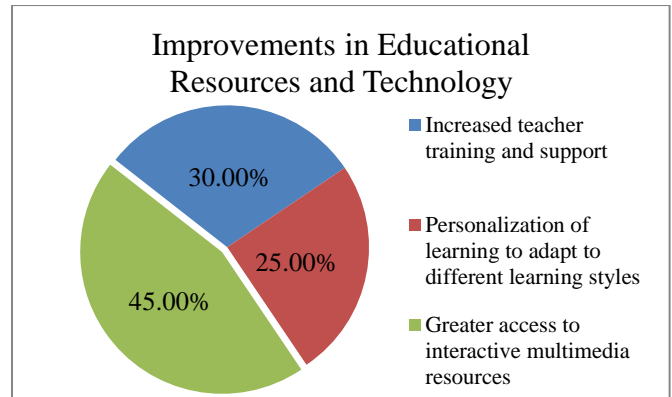


Fig. 9 Benefits of a web platform

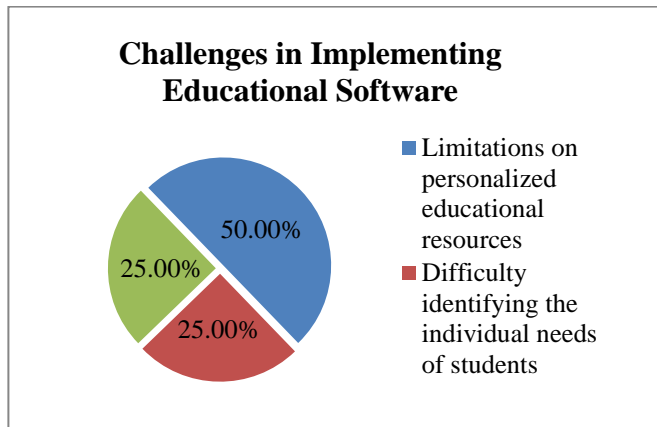


Fig. 6 Difficulty in one-on-one interaction

4. Discussion

Tensions in the Adoption of Educational Platforms [9] focuses on the tensions arising from the increase in the adoption of educational digital platforms during the health crisis. It highlights the conflict between the "need" to adapt to a post-digital reality and the perception that adopting critical stances is perceived as a threat to professional freedom and equitable access to education. Reflection on the crucial role of teachers in fostering critical and reflective stances emerges as a key point to address these challenges. Positive Impact of Gamification on Cognitive Demand [10] focuses on the results

of research on mixed gamification and its positive impact on mathematical cognitive demand. The increase in scores is highlighted, indicating improvements in the non-connective and connective demand approaches. While acknowledging the effectiveness of technological resources in gamification, the need to replicate the study with lengthy implementations and game variations to obtain more robust conclusions is underlined.

Growth of Distance Education and Homeschooling [12] addresses the crucial role of technological advances in the growth of distance education and the rise of homeschooling. The influence of Information and Communication Technologies (ICT) and its impact both nationally and internationally is highlighted. The research highlights the need to reconsider proposals for compulsory face-to-face schooling, underlining the importance of a qualitative approach in the analysis of Virtual Learning Environments with Educational Platforms and the sociocultural perspective of families.

Evaluation and Monitoring of Educational Platforms [13] focuses on the key results of the evaluation project of the CREA educational platform. The usefulness of the summarized indicators and the web application to monitor the use of the platform at different levels of analysis is highlighted. The discussion focuses on improving the quality of teaching by identifying students at risk of academic lag. The importance of the predictive capacity of the information generated in CREA for the results of the adaptive test is

underlined, and the need to replicate the study with prolonged implementations and variations in the use of the platform is highlighted.

5. Conclusion

The design of an educational platform to improve the learning of social sciences courses in primary school students is presented as a necessary and relevant response in the current educational context. Through the reviewed background, the growing importance of technology in education is evident, either to adapt to health crises, as has been observed in the agile adoption of digital platforms, or to enhance learning through strategies such as gamification. The research also highlights the evolution of distance education and homeschooling, underlining the significant influence of technologies in the transformation of traditional educational methods.

The evaluation and monitoring of educational platforms, as presented in one of the studies, reinforces the importance of implementing technological tools that allow effective monitoring of student progress. In this context, the design of an educational platform must address the need for personalization of learning, integration of interactive content, and ease of access, considering the diversity of learning styles and the changing demands of the educational environment. The overall conclusion highlights the relevance of embracing technology in an innovative way to enhance the learning of primary school students in the field of social sciences.

References

- [1] Pilar Cecilia Rodriguez Morales, "Can Uniform and Universal Technology Access Policies Reverse Educational Inequalities," *International Journal of Education for Social Justice*, vol. 9, no. 3, 2020. [[Google Scholar](#)] [[Publisher Link](#)]
- [2] Gloria Leticia Montalvo-Charles, José Torres-Jiménez, and Ezra Federico Parra-González, "Information and Communication Technologies (ICTs) in Distance Education during the COVID-19 Pandemic Used in Primary Education," *Contemporary Dilemmas: Education, Politics and Values*, 2021. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [3] David Del Valle-Ramón, Ana García-Valcárcel Muñoz-Repiso, and Verónica Basilotta Gómez-Pablos, "Project-Based Learning through the Youtube Platform for Teaching Mathematics in Primary Education," *Education in the Knowledge Society (EKS)*, vol. 21, 2020. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [4] Enrique Lee Huamani et al., "Design of an IoT Prototype for the Prevention of Robberies in the Young Areas of Lima," *International Journal of Engineering Trends and Technology*, vol. 70, no. 9, pp. 111-118, 2022. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [5] Beatriz Isela Bejar Figueroa, and Luis Edilberto Garay Peña, "Teaching Practice in Distance Education, COVID-19," *Llamkasun*, vol. 2, no. 3, pp. 28-44, 2021. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [6] Enrique Lee Huamani et al., "Prototype of a Mobile Application for the Detection of Car Accidents on the Roads of Peru," *International Journal on Recent and Innovation Trends in Computing and Communication*, vol. 11, no. 3, pp. 1-6, 2023. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [7] Santa Flores Barrera et al., "The challenges of Teaching-Learning after the Pandemic in Primary Education," *NeyArt Multidisciplinary Scientific Magazine*, vol. 1, no. 1, pp. 1-21, 2023. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [8] Jaime Muñoz Arteaga et al., "Challenges of Inclusive Teaching at the Primary Education Level during the COVID-19 Contingency," *Campus Virtuales*, vol. 11, no. 1, pp. 125-135, 2022. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [9] Judith Jacovkis et al., "Resist, Align or Adhere, Educational Centers and Families in the Face of BigTech and its Digital Educational Platforms," *Electronic Magazine of Educational Technology*, vol. 82, 2022. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [10] Jhon A. Holguin Alvarez et al., "Mixed Gamification with Video Games and Educational Platforms: A Study on Mathematical Cognitive Demand," *Digital Education Review*, vol. 42, pp. 136-153, 2022. [[Google Scholar](#)] [[Publisher Link](#)]

- [11] Shalom Adonai Huaraz Morales, “Augmented Reality: Prototype for the Teaching-Learning Process in Peru,” *International Journal of Advanced Computer Science and Applications*, vol. 13, no. 1, pp. 1-10, 2022. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [12] Liliana Ramírez-Vera, Maria Guadalupe Veytia, and Rebecca English, “Educational Platforms and Basic Understandings of Homeschooling in Mexico,” *Scientific Bulletin of Social Sciences and Humanities of the ICSHu*, vol. 8, no. 16, pp. 65-70, 2020. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [13] Janeth Amparito Llumiyinga Loya et al., “Evaluation of Digital Platforms in Education: A Systematic Review of Tools and Methodologies,” *Latin Science Multidisciplinary Scientific Magazine*, vol. 7, no. 2, pp. 7743-7763, 2023. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [14] Zaid Sanchez et al., “An Algorithm for Characterizing Skin Moles Using Image Processing and Machine Learning,” *International Journal of Electrical and Computer Engineering*, vol. 11, no. 4, pp. 1-12, 2021. [[CrossRef](#)] [[Google Scholar](#)] [[Publisher Link](#)]
- [15] L. Rodríguez et al., “Implementation of a Telediagnostic System for Tuberculosis and Determination of Multi-Drug Resistance Based in the Mods Method in Trujillo, Peru,” *Peruvian Journal of Experimental Medicine and Public Health*, vol. 31, no. 3, pp. 445-453, 2014. [[Google Scholar](#)] [[Publisher Link](#)]