Polo del Conocimiento

Pol. Con. (Edición núm. 104) Vol. 10, No 3
Marzo 2025, pp. 1036-1055
ISSN: 2550 - 682X
DOI: https://doi.org/10.23857/pc.v10i3.9104

Herramientas digitales y calidad educativa en ciencias naturales
Un estudio descriptivo

Digital tools and educational quality in natural sciences
A descriptive study

Ferramentas digitais e qualidade educacional em ciências naturais
Um estudo descritivo

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Ciencias de la Educación
Artículo de Investigación

*** Recibido:** 13 de enero de 2025 ***Aceptado:** 20 de febrero de 2025 *** Publicado:** 14 de marzo de 2025

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Introduction

Educational quality is conceived as a dynamic and continuous process that integrates effectiveness, equity, and relevance (Edilma & Kárpava, 2020). In contemporary society, guaranteeing quality education is an unavoidable priority, though multiple challenges persist for its consolidation. In this sense, the implementation of digital tools in educational environments has emerged as a fundamental strategy to strengthen teaching-learning processes, particularly in disciplines such as Natural Sciences.

The use of digital tools contributes significantly to enriching the educational process by providing interactive and visual didactic experiences that favor the understanding of complex concepts. These technologies also enable the personalization of learning, allowing students to progress at their own pace and access resources tailored to their interests and needs. The integration of these tools redefines teaching and learning methods, positively impacting student formation.

According to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2024), technology plays a key role in education by facilitating access to information, promoting equity, and developing essential competencies for the 21st century. In Latin America, recent studies show that the use of digital resources fosters active learning and student motivation.

In the Ecuadorian context, the Ministry of Education (MINEDUC, 2011) has implemented policies aimed at integrating technologies in the classroom to improve educational quality through interactive methodologies. However, the effective adoption of these initiatives is limited by factors such as infrastructure deficiencies and insufficient teacher training, which particularly affects rural areas.

Locally, Garzón et al. (2022) emphasize that access to digital tools is decisive in enhancing academic performance and strengthening students' scientific and technological knowledge. In this regard, the implementation of educational technologies not only optimizes the learning process but also fosters the development of essential digital competencies in today's society.

Through preliminary observation, critical challenges in the integration of digital tools in education were identified, highlighting the limited use of digital platforms by teachers, which negatively impacts student motivation and active learning.

This study examines the impact of digital tools on the teaching-learning process of Natural Sciences in the seventh grade at General Manuel Serrano School (El Guabo, Ecuador, 2024–2025). The central problem lies in the restricted use of technologies due to a lack of teacher training, inadequate

infrastructure, and traditional methodologies. The general objective is to analyze the impact of digital tools on educational quality, with an emphasis on platforms such as Google Classroom, Kahoot, and YouTube Kids. The relevance of the study lies in its contribution to the formulation of inclusive educational policies aligned with Sustainable Development Goals (SDG 4) (UNESCO, 2024).

Literature Review

Digital Tools in Education

Digital tools designed for learning development are software programs that foster both active and collaborative learning (Carcaño, 2021). These applications optimize educational activities by providing resources previously available online, thereby reducing teachers' workload and allowing better time management.

According to Peralta et al. (2022), among the most widely used digital tools in education are platforms integrated into Google Workspace, such as Google Drive, Google Docs, Google Slides, and Google Sites. These applications play an essential role in the teaching-learning process, as they promote inquiry-based and collaborative methodologies.

There are digital tools specialized in knowledge acquisition, such as Duolingo, Coursera, Edmodo, Wordwall, and Live Worksheets. These platforms offer online courses, interactive activities, and educational resources tailored to each student's learning pace, thereby promoting autonomous and continuous learning.

On the other hand, content creation tools allow users to generate visual, written, or audiovisual materials in an accessible and professional manner. Among these, Canva, Adobe Spark, YouTube Kids, Educaplay, and iMovie stand out, as they have facilitated access to digital educational content production (Ccoa & Alvites, 2021).

Similarly, Walss (2021) notes that there are technological tools designed to facilitate teaching by enabling the planning of learning objectives, content development, and assessment of acquired knowledge. Among these, Edpuzzle, Genially, Quizlet, and Socrative stand out. These tools are easily accessible and usable for both teachers and students, with the advantage of being compatible with various devices.

The constant development of technology has driven the evolution of these digital tools, allowing their adaptation to society's changing demands. The correct selection and application of these

technologies are fundamental to optimizing educational processes, facilitating innovative methodologies that enhance active and collaborative learning. Examples include platforms such as Google Classroom, Microsoft Teams, and Moodle, which have revolutionized education by enabling virtual classroom management, resource distribution, and online assessments. Their versatility supports both in-person and remote education, ensuring accessibility to academic training.

Educational Quality

Digital technologies have proven to be key elements in improving educational quality, as their proper implementation significantly contributes to strengthening teaching and learning processes. The absence of strategies for integrating these tools could exacerbate deficiencies in academic training, affecting the development of digital competencies in teachers and students. The lack of teacher training in educational technologies could lead to traditional pedagogical practices that do not meet the demands of the knowledge society.

According to Ramírez & Arroyo (2022), educational quality is a dynamic process sustained by the interdependence of multiple factors, particularly the relationships among students, their families, and members of the educational community. Improving quality requires strengthening these bonds, as any deficiency in one of these elements directly affects the global structure of the educational system.

In this sense, educational quality should not be considered an isolated objective but a fundamental principle that permeates all dimensions of institutional activity. To this end, it is essential to foster a culture of cooperation and commitment among all actors in the educational system. Improvements in interactions and the resolution of difficulties at any level of the educational process generate a more harmonious and productive environment, thereby benefiting students and educational institutions.

For their part, Rojas, Sánchez, and Gaona (2018) argue that educational quality is a determining factor in academic competitiveness, as it allows achieving standards of excellence in learning. However, its conceptualization is complex, as it involves not only the acquisition of theoretical knowledge but also the development of social, emotional, and civic skills that prepare students to face the challenges of the current context.

In this line, Edilma & Kárpava (2020) propose that educational quality is defined through five key dimensions: effectiveness, efficiency, equity, relevance, and pertinence. Effectiveness is evaluated

through the fulfillment of educational objectives, ensuring that students achieve meaningful learning. Efficiency is oriented toward the adequate distribution of educational resources, guaranteeing their impact on the development of the educational system. Equity seeks equality of opportunities in access to education, adapting to students' individual needs. Relevance refers to the alignment of educational programs with sociocultural and economic realities, fostering inclusion and contextualized learning. Finally, pertinence implies the connection of the educational system with social demands and personal development, ensuring that curricular plans respond to contemporary challenges.

In Ecuador, educational quality is measured through standards defined by the Ministry of Education, which establish criteria for learning, school management, and teacher performance (Álvaro, 2020). However, inequalities persist between urban and rural sectors, evidenced by infrastructure deficiencies and limited access to technology, which directly impacts the quality of education (Zambrano et al., 2020).

Legal Framework

The Ecuadorian legal framework recognizes education as a fundamental right and an inescapable duty of the State. The Constitution of Ecuador, in Articles 26 and 27, establishes education as a priority pillar of public policy and state investment, guaranteeing equality and social inclusion. In this regard, Article 346 stipulates the existence of an autonomous body responsible for the comprehensive evaluation of the educational system to promote continuous improvement of educational quality.

Similarly, Article 347 assigns the State the responsibility of incorporating information and communication technologies into educational processes, strengthening the link between teaching and productive and social dynamics. In accordance with this principle, the Organic Law of Intercultural Education (LOEI, 2020) underscores the importance of guaranteeing quality and warm education, adapted to contextual realities and with permanent evaluation mechanisms.

The Code of Childhood and Adolescence, in Article 35, establishes the right of children and adolescents to quality education, ensuring that they have trained teachers, adequate didactic materials, and appropriate infrastructure for optimal learning. However, the educational reality presents significant challenges in terms of equity and access to technology, limiting the effective implementation of inclusive and sustainable policies.

In this context, the adoption of digital tools represents a key strategy to strengthen education, reduce learning gaps, and promote innovative pedagogical models that respond to the needs of the 21st century.

Methodology

This study adopts a mixed approach with an explanatory-descriptive level. It is classified as explanatory because it examines the cause-effect relationship between the dependent variable (digital tools) and the independent variable (educational quality). It is also descriptive because it characterizes the population, context, and study subject, providing a detailed and precise analysis of the investigated phenomenon.

The research is conducted under a documentary and field modality. A systematic review of previous studies and documents related to the topic is carried out, complemented by the application of data collection instruments in the specific context of General Manuel Serrano School. This strategy allows obtaining primary information directly linked to the study subject.

The units of analysis include teachers and students. The study universe consists of 139 seventh-grade students of Basic General Education (EGB) at the aforementioned educational institution, distributed into four groups: "A" (34 students), "B" (35 students), "C" (35 students), and "D" (35 students). The sample was selected probabilistically, ensuring representativeness and robustness in the results. Additionally, four teachers responsible for the mentioned groups participated, as they are part of the educational process of the selected students.

For data collection, three main instruments were used: surveys, interviews, and observation. The surveys consisted of structured questionnaires with closed-ended questions designed to obtain data on the frequency of use of digital tools and perceptions of their impact on learning. Semi-structured interviews with teachers allowed for an in-depth exploration of the benefits and challenges they face when integrating these technologies into the classroom. Finally, non-participant observation was conducted to record the actual use of technological resources in teaching practices and their influence on the educational process.

In data analysis, the quantitative information obtained through surveys was tabulated and graphically represented using Microsoft Excel, facilitating the identification of relevant trends and patterns. Qualitative data, extracted from interviews and observations, were analyzed through thematic coding using Atlas.ti software. This procedure enabled the identification of categories and

the systematization of participants' perceptions and experiences, providing a comprehensive understanding of the use of digital tools in education.

Results

Results of the survey administered to seventh-grade students at "General Manuel Serrano Renda" School, El Guabo, 2024–2025 period.

Impact of Digital Tools on Educational Quality

Table 1. *Impact of Digital Tools on Educational Quality*

Impact of Digital Tools	**No.**	**%**
Significant Impact	24	23
Partial Impact	44	43
No Impact	35	34
Total	103	

It is highlighted that the majority of respondents (43%) believe digital tools have a partial impact on educational quality, while a significant number consider they have no impact. This may be due to students' limited knowledge of technology use in education, inequality, or teachers' lack of strategies to integrate these tools into teaching-learning processes.

Digital Tools Used in Classes

Table 2. *Digital Tools Used in Class*

Digital Tools Used in Classes	**No.**	**%**
YouTube Kids	24	23
Kahoot	16	15
Quizizz	1	1
Edmodo	0	0
Google Classroom	48	47
Padlet	0	0
Canva	4	4
Other (Specify):	0	0

None	10	10
Total	103	100

The data reflect a clear trend in the use of digital tools in Natural Sciences classes, where the most used tool by students is Google Classroom (47%), notable for its organization and task management. YouTube Kids is used as a visual complement for learning. The limited use of other applications reflects a lack of motivation, highlighting the need to improve access and technological training in the classroom.

Benefits of Applying Digital Tools in Teaching-Learning

Table 3. *Benefits of Applying Digital Tools in Teaching-Learning*

Benefits of Digital Tools	**No.**	**%**
Promote active learning	48	47
Promote dynamic interaction	22	22
Promote content personalization	10	10
Promote access to visual/interactive	23	21
Total	103	100

The results show that the majority of respondents (47%) primarily value the benefit of digital tools in active learning. This demonstrates a positive perception of their ability to promote practical, visual, and personalized learning.

A total of 43% of respondents in this study believe digital tools improve the understanding of scientific concepts. This critical information confirms the necessity of incorporating them to enhance academic performance.

Impact of Digital Tools on Educational Quality

Table 4. *Impact of Digital Tools on Educational Quality*

Impact of Digital Tools	**No.**	**%**
High	72	70
Medium	21	20

Low	10	10
Total	103	100

The table demonstrates a high impact (70%) of digital tools on educational quality, underscoring the importance of strengthening their integration to improve their level of influence.

Aspects Ensured by Implementing Digital Tools in Educational Quality

Table 5. *Aspects Ensured by Implementing Digital Tools in Educational Quality*

Aspects Ensured by Digital Tools	**No.**	**%**
Integration into the knowledge society	16	16
Access to information	70	68
Learning personalization	17	16
Total	103	100

In coherence with the results, implementing digital tools in education ensures better access to information (68%) to improve educational quality.

Implementation of Technological Tools in Educational Standards

Table 6. *Implementation of Technological Tools in Educational Standards*

Implementation of Technological Tools	**No.**	**%**
Improve student academic results	64	62
Promote equity in access to quality education	10	10
Facilitate monitoring and evaluation of progress	15	14
Contribute to teacher professionalization	8	8
Ensure structured and organized learning	4	4
No significant influence on educational quality	2	2
Total	103	100

The data reveal that implementing these tools not only facilitates monitoring and evaluation but also promotes learning improvement (62%). Although a small percentage considers their impact

Pol. Con. (Edición núm. 104) Vol. 10, No 3, Marzo 2025, pp. 1036-1055, ISSN: 2550 - 682X

limited, results indicate a favorable trend toward technology, acknowledging its potential to contribute significantly to educational quality.

Digital Tools to Implement for Improving Educational Quality

Table 7. *Digital Tools to Implement for Improving Educational Quality*

Digital Tools to Implement	**No.**	**. %**
YouTube Kids	28	27
Kahoot	12	12
Quizizz	4	4
Edmodo	1	1
Google Classroom	48	47
Padlet	0	0
Canva	5	5
Other (Specify):	0	0
None	5	5
Total	103	100

The data indicate a growing affirmation of the importance of these tools, though they also show that Google Classroom (47%) should be prioritized for better teaching.

Benefits of the Kahoot Platform in Teaching-Learning

Table 8. *Benefits of the Kahoot Platform in Teaching-Learning*

Benefits of Kahoot	***No.***	***%***
Quizzes	*60*	*58*
Surveys	*28*	*27*
Debates	*12*	*12*
Other	*0*	*0*
None	*3*	*3*
Total	*103*	*100*

The table highlights the relevance of integrating tools like Kahoot into the teaching-learning process, as quizzes and surveys (58% and 27%, respectively) are highly valued for their capacity to benefit learning.

Contribution of the Quizizz Platform

Table 9. *Contribution of the Quizizz Platform*

Contribution of Quizizz	**No.**	**%**
Interactive Quizzes	54	52
Gamified Activities	44	43
Other	2	2
None	3	3
Total	103	100

The data highlight Quizizz as a valuable educational tool, noted for enriching learning through interactive quizzes and gamified activities (52% and 43%, respectively), fostering interaction, engagement, and active learning.

Contribution of the Canva Platform

Table 10. *Contribution of the Canva Platform*

Contribution of Canva	**No.**	**%**
Infographics	12	12
Presentations	20	19
Posters	5	5
Maps	24	23
Educational Materials	40	39
Other	0	0
None	2	2
Total	103	100

The data demonstrate Canva's efficiency and versatility as a key educational tool for improving the teaching-learning process. Its visual approach fosters creativity in maps, presentations, and infographics, valued for developing critical thinking, communication, and organization, adapting to diverse learning styles and needs while enhancing the learning experience.

Contribution of the YouTube Kids Platform

Table 11. *Contribution of the YouTube Kids Platform*

Contribution of YouTube Kids	**No.**	**%**
Creative Content	32	31
Safe Content	12	12
Entertaining Content	20	19
Educational Content	39	38
Total	103	100

The data underscore YouTube Kids as an educational tool that combines educational, creative, and entertaining content. Its ability to balance learning and entertainment makes it a significant resource for enriching educational experiences.

Digital Tools Benefiting Educational Quality in Teaching-Learning

Table 12. *Digital Tools Benefiting Educational Quality in Teaching-Learning*

Digital Tools Benefit Educational Quality	**No.**	**%**
Yes	72	70
No	11	11
May be	20	19
Total	103	100

The data highlight the significant impact of digital tools on educational quality, as they facilitate personalized learning.

Results of Teacher Interviews

Impact of Digital Tools on Educational Quality

The interviews conducted with teachers reveal that all of them consider digital tools to have a positive impact on educational quality.

The results emphasize that teachers believe digital tools positively influence educational quality, as they enrich the teaching-learning process and contribute to student learning by making classes more dynamic, inclusive, and tailored to individual needs.

Digital Tools Currently Used by Teachers in Natural Sciences Classes

Regarding the digital tools currently used by teachers in seventh-grade Natural Sciences classes at General Manuel Serrano School (El Guabo, 2024–2025), teachers stated that they use digital tools to complement traditional resources and enhance the teaching-learning process. Mentioned tools include YouTube and LiveWorksheets, supported by a projector to present activities.

Benefits of Applying Digital Tools in Natural Sciences Teaching-Learning

Regarding the benefits of applying digital tools in Natural Sciences teaching-learning, teachers reported that these tools make classes more dynamic and interactive, foster autonomous learning, and improve content comprehension and retention.

Aspects Improved by Digital Tools in Teaching-Learning

Regarding aspects improved by digital tools in Natural Sciences teaching-learning, teachers stated that the tools enhance attention, concentration, and active student participation.

Level of Impact of Digital Tools on Educational Quality

Regarding the level of impact of digital tools on educational quality, teachers indicated that digital tools have a high or superior impact on educational quality, highlighting their positive effect on interactivity, active participation, and knowledge retention.

Aspects Ensured by Implementing Digital Tools in Educational Quality

Regarding aspects ensured by implementing digital tools in educational quality, teachers stated that digital tools guarantee autonomous, personalized, and interactive learning, along with continuous feedback.

Implementation of Technological Tools in Educational Standards in Natural Sciences

Regarding the implementation of technological tools in educational standards for seventh-grade Natural Sciences at General Manuel Serrano School (El Guabo, 2024–2025), teachers indicated

that such implementation enhances equity and relevance by helping students learn new skills to navigate the digital world.

Digital Tools to Implement for Improving Educational Quality

When interviewed about tools to implement for improving educational quality, teachers suggested using visual resources such as videos, images, and activities accompanied by interactive platforms like Canva and YouTube.

Benefits of the Kahoot Platform in Teaching-Learning

Regarding the benefits of the Kahoot platform, teachers stated that it allows the creation of interactive learning games that help assess or reinforce specific topics covered in class.

Use of the Quizizz Platform in Natural Sciences

Regarding the use of the Quizizz platform, teachers mentioned that this tool significantly contributes to exploring and reinforcing student knowledge through interaction and leveraging prior knowledge.

Use of the Canva Platform in Natural Sciences

Regarding the use of Canva, teachers noted that this tool enhances students' visual and linguistic creativity, motivating them to develop creativity, participation, and interaction skills.

Use of the YouTube Kids Platform in Natural Sciences

Regarding the use of YouTube Kids, teachers highlighted its ability to increase student concentration and motivation, considering it an innovative strategy for the subject.

Digital Tools Benefiting Educational Quality in Natural Sciences Teaching-Learning

When interviewed about the benefits of digital tools to educational quality, teachers stated that these tools significantly benefit education by adapting activities to each student's needs.

Observation Guide Results

Title: Digital Tools Used in Natural Sciences Classes

Observation of the teaching-learning process shows very limited use of digital tools in seventh-grade Natural Sciences classes. In most courses, teachers do not use any digital tools to deliver their lessons, making it difficult for students to link theory with practice, reducing content comprehension and retention, and causing demotivation or frustration, particularly among certain students. However, it was noted that one teacher occasionally uses resources like YouTube Kids and Kahoot to make classes more dynamic and interactive. This result underscores the need to

promote teacher training strategies and the use of digital tools to enrich the teaching-learning process in this subject.

Title: Digital Resources Used to Teach Natural Sciences Classes

Observation to verify the digital resources used by teachers to deliver seventh-grade Natural Sciences classes revealed that most teachers use cell phones, computers, and projectors, while televisions are not used at all. This reflects limited reliance on digital tools in the classroom, which may be due to device usage limitations or a lack of pedagogical integration of these resources. These data highlight the need to improve the availability and use of these tools to enrich and optimize learning, fostering dynamic interactions between teachers and students.

Discussion

Based on data collected through field instruments such as surveys, interviews, and observation guides administered to seventh-grade teachers and students at General Manuel Serrano Renda School, the results are discussed below, supported by relevant documentary information.

According to research by Romo et al. (2023), which directly relates to the results obtained and presented in the 2023 issue of *Polo del Conocimiento*, the most used tool is Google Classroom, which offers benefits such as adapting learning to each student and fostering collaboration.

Thus, the use of Google Classroom in education helps tailor learning to individual students and encourages collaboration, making learning more flexible and personalized. As these authors suggest, we agree that digital tools should be implemented to improve educational quality in Natural Sciences, thereby enhancing academic performance and students' holistic growth.

On the other hand, according to Molinero & Chávez (2019), which directly relates to results presented in the 2019 issue of *Iberoamerican Journal for Research and Educational Development*, the most used tool in their study was Canva.

Therefore, the use of Canva highlights its relevance in educational contexts, as its implementation improves aspects such as content presentation, creativity, and student motivation. As these authors argue, we concur that this tool should be implemented to enhance educational quality.

According to Bodero (2014), which directly relates to results presented in the 2014 article in *Ciencia y Sociedad*, recognizing whether an educational system or institution is of good quality is not only a theoretical issue but also a crucial part of professional work. Thus, teachers must use tools to facilitate student tasks.

In this way, educational quality lies in its capacity to transform society through personal development, serving as a fundamental pillar for individual and collective progress. Providing adequate tools and resources to facilitate student learning aligns with these authors' views, and we agree that digital tools should be implemented to improve educational quality and teaching-learning processes.

According to López F. (2021), teachers must maintain high motivation to achieve higher standards in educational institutions and sustain high-quality educational processes.

Therefore, teachers must act with dedication and commitment, not only to fulfill their duties but also to inspire students to reach their full potential. Teacher motivation is closely tied to educational quality, as motivated teachers tend to innovate their methods, pursue continuous training, and adapt to student needs. Thus, we agree with the authors that teacher training has a high impact on maintaining quality education.

According to Mainato et al. (2023), which directly relates to results presented in the 2023 issue of *Journal of Pedagogical Science Dissemination*, technological tools are fundamental for teaching-learning, enabling students to learn in a fun, dynamic, and interactive manner. Teachers play a vital role in guiding students to manage these tools, fostering mutual learning and improvement.

Thus, digital tools not only improve learning but also foster interest and active student participation. By integrating digital platforms or interactive resources, teachers can engage students and inspire them to explore knowledge from practical and appealing perspectives. Therefore, we agree with the authors that digital tools are essential for transforming education into a dynamic and interactive experience.

According to Cámara & Hernández (2022), digital tools are a means to support teaching and learning strategies, changing how students and teachers interact and communicate, thereby influencing new forms of learning assessment.

Thus, digital tools not only enrich the educational process but also open doors to dynamic, personalized, and digitally adapted assessment methods. Therefore, we agree with the authors that digital tools are essential for strengthening teaching-learning in the classroom.

The results confirm that tools like Kahoot and YouTube Kids enhance motivation and autonomous learning, aligning with previous studies (Romo et al., 2023). However, gaps in teacher training limit their potential, consistent with findings by Rodríguez et al. (2021). Insufficient infrastructure

reflects systemic challenges in Ecuadorian rural areas (Zambrano et al., 2020), demanding policies focused on teacher training and technological access.

Conclusions

1. The digital tools impacting the educational quality of seventh-grade Natural Sciences at General Manuel Serrano School (El Guabo, 2024–2025) are Google Classroom, YouTube Kids, and Kahoot.
2. The level of impact of digital tools on quality is high.
3. The digital tools to implement for influencing the educational quality of the Natural Sciences teaching-learning process at General Manuel Serrano School (El Guabo, 2024–2025) are Google Classroom, YouTube Kids, and Kahoot.

References

1. Álvaro, F. (2020). School management and educational quality in basic-level educational institutions. Science and Education, 1(1), 45. https://doi.org/10.48169/Ecuatesis/0101202005
2. Almaraz, A. (2020, July 5). Advantages of technology. Con Ciencia SERRANA, 2(4), 32. https://repository.uaeh.edu.mx/revistas/index.php/ixtlahuaco/article/view/6159/7400
3. Almaraz, A. J. (2022, July 5). Advantages of technology. Con-Ciencia SERRANA, 2(4), 31. https://repository.uaeh.edu.mx/revistas/index.php/ixtlahuaco/article/view/6159/7400
4. Arcentales, M., García, D., Cárdenas, N., & Erazo, J. (2020). Canva as a didactic strategy in teaching language and literature. CIENCIAMATRIA: Interdisciplinary Journal of Humanities, Education, Science, and Technology, 6(3), 125. https://dialnet.unirioja.es/servlet/articulo?codigo=8318340
5. Barriga, G., Orbegoso, O., & Colán, H. (2023, February). Educational quality in regular basic education institutions. Horizontes Journal, 7(28), 927. https://doi.org/10.33996/revistahorizontes.v7i28.564
6. Beltrán, E., Prieto, W., Gómez, N., & Ochoa, M. (2020, December). Assurance of educational quality in the context of a social state of law. CONRADO: Pedagogical Journal of the University of Cienfuegos, 16(77), 221. http://scielo.sld.cu/scielo.php?pid=S1990-86442020000600209
7. Betancur, V., & García, A. V. (2023, December 12). Application of the principles of multimedia cognitive learning theory to the design of learning situations and training scenarios: A systematic literature review. Education in the Knowledge Society Journal, 24, 24. https://doi.org/10.14201/eks.30882
8. Bodero, D. (2014, May). The impact of educational quality. Notes on Science & Society, 4(1), 113. https://dialnet.unirioja.es/servlet/articulo?codigo=5042937
9. Borja, G., & Carcausto, W. (2020, December 17). Digital tools in Latin American university education: A bibliographic review. Education in the Americas Journal, 10(2), 1. https://doi.org/10.35811/rea.v10i2.123
10. Cámara, C., & Hernández, C. (2022, February 28). The use of digital tools for teaching in higher education during the COVID-19 pandemic: A pilot study. Eduscientia: Educational

Science Dissemination, 5(9), 45. http://www.eduscientia.com/index.php/journal/article/view/171

11. Carcaño, E. (2021, April 28). Digital tools for learning development. Vinculando Journal, 5. https://vinculando.org/educacion/herramientas-digitales-para-el-desarrollo-de-aprendizajes.html
12. Edilma, F., & Kárpava, A. (2020, May 21). Educational quality: An analysis from violence in Colombia. Espacios Journal, 41(18), 4–5. http://bdigital2.ula.ve:8080/xmlui/handle/654321/9457
13. Garzón, A. A., Segovi, C. J., & Mora, C. R. (2022, November 15). Study of the digital divide and the teaching-learning process in Ecuador: Case study of the Technical University of Machala. Angola Science Journal, 4(1). https://www.redalyc.org/journal/7041/704173402006/html/
14. Gómez, J. (2020). Google Classroom as a tool for pedagogical management. Journal of Pedagogical Experience Dissemination, 14, 45. https://dialnet.unirioja.es/servlet/articulo?codigo=8380468
15. López, F. (2021, April). Teacher motivation to achieve educational quality in higher education institutions. Virtual Journal of the Northern Catholic University, 64. https://doi.org/10.35575/rvucn.n64a7
16. MINEDUC. (2011). Introduction to information and communication technologies. Ministry of Education. https://educacion.gob.ec/tecnologia/
17. Molinero, B., & Chávez, M. (2019, December). Technological tools in the teaching-learning process in higher education students. Iberoamerican Journal for Research and Educational Development, 10(19), 27. https://doi.org/10.23913/ride.v10i19.494
18. Peralta, L. E., Gaona, M. d., Luna, M. L., & Dávila, O. M. (2022, April). Digital tools and scientific inquiry in secondary education students: A literature review. Ciencia Latina Multidisciplinary Journal, 6(2), 1002. https://doi.org/10.37811/cl_rcm.v6i2.1933
19. Ramírez, J., & Arroyo, J. (2022, March). Interpersonal relationships and educational quality. Tecno Humanismo: Scientific Journal, 2(3), 17. https://dialnet.unirioja.es/servlet/articulo?codigo=8356012

20. Romo, P., Gómez, R., Rubio, C., & Nivel, C. (2023, October). Digital tools in the teaching-learning process through bibliographic review. Polo del Conocimiento, 8(10), 317. https://doi.org/10.23857/pc.v8i10.6127
21. UNESCO. (2024). Global education monitoring report 2023: Technology in education: A tool on whose terms? https://doi.org/10.54676/NEDS2300
22. Zambrano, J., Zambrano, H., Bravo, M., & Basurto, M. (2020, June). Curriculum design as a determining factor in improving educational quality in Ecuadorian secondary education. Scientific Journal Domain of Sciences, 6(2), 265. http://dx.doi.org/10.23857/dc.v6i3.1217