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# Formative Research in the Digital Context and Academic Competence in their Academic Works of University Students

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## Abstract

*Traditional teaching methodologies, such as lectures, are not the most effective in improving students' academic competence. However, through learning through formative research and the use of educational technologies, university students can better develop their academic competencies. The objective of this article was to determine the relationship between formative research in the context of dynamic digital technology and the academic competence of students at the Universidad Nacional del Altiplano in Peru. The methodology used was quantitative, cross-sectional and correlational. A survey was applied in the three areas of professional training, such as: social sciences, biomedical and engineering, to a representative sample of 382 students of both sexes, out of a population of 17,000 students. The findings of the research revealed a moderate positive relationship (r = 0.469), with a significance level of (p value = 0.00 < 0.05). This indicates that formative research, using various dynamic didactic techniques, is directly related to the academic competence of students in the elaboration of their academic works.*

**Keywords:** *Interactive Method, Formative Research, Academic Competence, Keynote Lecture, Academic Work.*

## Introduction

The university represents a vocational training center, where its graduates must be prepared to address the challenges of economic and social development. In this context, a solid professional training, based on innovative teaching methods and the integration of technology in education, becomes imperative (Lerchenfeldt et al., 2021), where students are already immersed in this digital environment, interacting through social networks, technological games, and online platforms (Zakaria et al., 2020). This different educational paradigm encourages active learning in teams, allowing students to become active agents of their own learning process (Alamoudi et al., 2021).

However, in universities, traditional teaching techniques such as lectures are still in force, although they are no longer adequate today, as Baños et al. (2024) point out, that conventional lectures and laboratory activities are obsolete. These methods are based on a one-way teaching theory, where information is transferred to the student without encouraging reflection or the generation of knowledge (Valbuena-Bermúdez et al., 2024). Meanwhile, teaching based on formative research with the use of interactive dynamic learning methods allows the development of skills such as critical analysis, interpretation, and synthesis (Miyahira, 2009). This type of educational teaching places the student at the center of their learning process, fostering responsibility and commitment to research within the context of teaching-learning strategies (Espinoza & Eudaldo, 2020).

Learning through the formative research method with the use of dynamic technologies has become increasingly relevant, taking advantage of the popularity of cell phones, tablets, and laptops (Valbuena-Bermúdez et al., 2024). This has facilitated access to online education through various platforms such as

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YouTube, Facebook, WhatsApp, and search engines that allow access to scientific literature that has been transforming the educational process (Mishra et al., 2020). To achieve the purpose, formative research requires critical and creative thinking on the part of the student, reflected in experience-based learning, problem-based learning, the project method and the monograph (González, 2006), where it is important to pay attention to writing, bibliographic research and research ethics during the process of preparing the academic text (Espinoza & Eudaldo, 2020). This allows online learning communities to promote a pedagogical-centered approach, encouraging collaborative knowledge creation and sharing (Wodzicki et al., 2012).

However, traditional lecture-type education does not allow students to reflect and motivate creativity to develop their academic skills. Therefore, the article justifies that the use of formative research through digital didactic techniques such as virtual platforms can improve these competencies. Despite existing studies on the use of didactic technologies in education, there is a lack of information on formative research using virtual didactic techniques in the teaching process and development of students' academic competencies. Therefore, this research aims to fill this gap by providing detailed data on the relationship between these variables. The results will not only help improve the academic competence of students, but will also allow the institution to make decisions to improve teaching in the professional training of its students (Mansoor, 2021). The objective of this article was to determine the relationship between formative research in the dynamic digital context and the academic competence of students at the Universidad Nacional del Altiplano in Peru.

The article is organized as follows: a theoretical framework is presented that explains the theories pertinent to the phenomenon studied. Then the methodology used in the research is described, followed by the analysis and discussion of the results obtained, where they are contrasted with previous studies. Finally, the study is concluded considering the dimensions analyzed.

## *Theoretical Framework*

### *Formative Research*

Formative research today should develop in a dynamic environment to develop students' academic competencies. Authors such as Asís et al. (2022) explain that formative research is carried out among students and teachers during the curricular development of a program. This approach is associated with a change in the conception of teaching-learning, considering it as a process rather than as a product (Pérez & Osses, 2015). In this context, formative research should involve the active participation of students and the accompaniment of the teacher, using didactic technologies to promote the development of academic competencies

Contemporary education demands a dynamic approach from the actors involved to ensure optimal learning. According to Upreti et al. (2024), formative research in the educational field is not a unidirectional process; rather, it provides students with crucial skills for their cognitive development, as well as the use of appropriate language for communication, critical thinking, and the assessment of processes and decisions. In this scenario, the teacher becomes an expert facilitator who responds to students' queries. Therefore, formative research involves a two-way process between the student and the teacher, where the former develop cognitive skills and capacities to make value judgments on the topics covered, under the guidance of the latter.

In accordance with what was expressed by Asís et al. (2022), that the purpose of research is to instruct students in the development of cognitive skills, such as analysis, idea generation and problem solving, in addition to acquiring pedagogical and didactic knowledge to promote innovation and creativity, through interactive applications (Corral et al., 2021). But, for (Corona, 2023) the main objective of formative research is to promote research skills through flexible methods in didactic training spaces linked to the curriculum.

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*Dimensions f Formative Research In Virtual Environments*

Formative research in the context of contemporary education and the presence of technology, the dimensions can be considered under the logic of the following authors:

Chang-Hwa and Cheng-ping (2013), cited by Firipis (2018), identified four dimensions of the didactic technique through interactive applications such as Facebook social networks:

Motivation for learning: interaction on Facebook promoted positive interaction between peers.

Learning activities: the facilitation of communication, collaboration, and sharing of resources within a virtual environment promoted privacy, flexibility, and adaptability.

Learning style: students became active participants during the learning process, gaining experience in critical thinking about instructional information.

Peer mentoring and social networks: peer mentoring where one student instructs another in a subject in which the former is an expert and the latter is a novice.

These dimensions contribute to a quality educational practice in the implementation of active education in the university context (Gruno & Gibbons, 2021).

Along these lines (Bates, 2019) highlights the following dimensions: collaborative online learning, where he refers to how students can interact effectively in digital environments to improve collaborative learning; competency-based learning, which explores how key competencies can be developed and assessed in online environments; communities of practice, where it refers to how online learning communities can be formed and maintained; and agile design, refers to flexible learning design models that adapt to changing online environments. What the author means by these dimensions is that virtual didactic technology helps students develop teamwork skills for better academic learning and therefore the development of academic competencies.

*Digital Pedagogical Competence Tools*

During the Teacher Tech Summit Latam 2023, the head of Elige Educar of the Regional Office of Education for Latin America and the Caribbean highlighted the importance of developing digital pedagogical competencies in teachers, because this would allow for more and better opportunities for meaningful learning, reducing inequalities through carefully designed and implemented educational experiences (UNESCO, 2023). This statement highlights that the digital pedagogical skills acquired by teachers would facilitate the teaching-learning process that is dynamic for better learning for university students.

The current context of change has highlighted the need to reform existing education systems. Therefore, various methodological approaches have been developed, such as computer science, extended reality, games, and pedagogical tools in education (Valbuena-Bermúdez et al., 2024). The implementation of games in academic environments was presented as a complementary and attractive learning method to the traditional classroom, making educational practices more interactive and innovative (Gallegos et al., 2019).

Therefore, teaching methods must be adapted to the context to create a pedagogical design that takes advantage of technological tools and allows greater interaction and flexibility in learning, making classes more dynamic and interactive through the use of technological tools (Bates, 2019), where teachers must integrate a pedagogical redesign that promotes twenty-first century skills such as critical thinking, problem-solving and collaboration. In this way, the author tries to highlight that classes can be more dynamic with the support of virtual didactic techniques in the development of students' academic skills.

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On the other hand, García (2020) expands on the topic indicating that the growth of education is from distance education by mail, online learning, open education, virtual education and eLearning to Blended-learning; incorporating new technologies such as remote education and hybrid education. Therefore, as Deák et al. (2021) point out, the solution lies in pedagogy itself, where educators with adequate content knowledge must learn to merge their experience with virtual learning platforms. In this way, technology in education, such as virtual platforms, can complement optimal student learning and develop their academic skills.

*Formative Research Techniques For The Development Of Academic Competencies*

Some formative research techniques that can be permanently incorporated into university teaching include the development of critical knowledge of the topics, where the student's experience plays a fundamental role in the learning process (Baños et al., 2024). In this approach, the student lives, discovers, and draws conclusions, which enhances their understanding and analytical skills. In addition, the didactic technique of group teaching shows great potential for the development of students' academic competence (Cranney et al., 2022). Through these formative research methodologies, students can acquire academic competencies reflected in the elaboration of monographs and theoretical essays, where they assume active roles as authors.

Another pedagogical technique of formative research is the project-oriented learning method, which promotes collaborative work to find solutions to problems raised in formative research (Rubio-Hurtado et al., 2015). This approach encourages collaboration between students and teachers, as well as the analysis of practical cases (Espinoza & Eudaldo, 2020). In addition, Moreno (2011) suggests holding colloquiums where students present their research progress and receive comments from both the tutor and their classmates. These didactic strategies facilitate more effective learning, as students receive support from both their peers and their teachers (Kirk & Spencer, 2018).

*Academic Competence*

Competence, as defined by Baartman and Ruijs (2011), is the ability to employ specific combinations of knowledge, skills, and attitudes in specific contexts. According to Monereo and Pozo (2007), it involves the development of skills and abilities that allow people to function in the world, and is related to four major social scenarios: learning to learn, learning to cooperate, learning to communicate and learning to develop critical sense, as well as to foster intrinsic motivation. These concepts are not only based on individual actions, but also on the potentialities and influence of the environment (Castro, 2004).

In the university environment, academic competencies are closely linked to students' learning processes (Tuononen et al., 2019b). According to Harvard University, there are five main types of academic competencies: reading comprehension, semi-structured problem solving, hypothesis formulation and testing, oral and written communication, and computer skills (Betancur, 2010). These competencies refer to the ability of students to acquire knowledge, interpret it, argue it, explain it, and generate new ideas.

Charria et al. (2011) refer to the report of the secretariat's commission on the Acquisition of Necessary Skills for the Americas, which highlights the academic competencies associated with fundamental knowledge acquired in general training. These competencies are classified into skills such as creative thinking development, problem solving, decision-making, assimilation and understanding, learning ability, and reasoning. In this context, Rubio-Hurtado et al. (2015) highlight that students should be the protagonists of their training process, and curricula should include academic competencies and skills that strengthen research capacity. Students need to acquire skills to analyze, understand, interpret, and synthesize information to achieve these competencies (González, 2006). Therefore, students' academic competence can be attributed to their protagonism, their skills, interest and decision-making to develop topics based on the understanding and interpretation of information.

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## Methodology

The study was carried out during the second semester of the 2023 academic year at the Universidad Nacional del Altiplano in Peru. A quantitative descriptive methodological approach was used, thus allowing to understand the teaching-learning context through dynamic formative research techniques in the process of development of the courses of the curriculum. The research design was non-experimental and cross-sectional, which made it possible to collect data at a single time (Hernández et al., 2014), describing, collecting, and measuring data, and reporting information on various variables, components, or dimensions of the problem (Hernández-Sampieri & Mendoza, 2018).

The study population was 17 thousand undergraduate students from the National University of the Altiplano, distributed in three areas of professional training: social, biomedical and engineering. The stratified representative sample included 382 students, distributed according to the proportion of each area, with a confidence level of 95% and a margin of error of 5%. The sample, as a selected part of the population, provided the information for the study and was subjected to the measurement and observation of the variables studied (Bernal, 2010).

The variables analyzed were: Formative Research, which included 7 items related to dynamic learning techniques, and Academic Competence, composed of 4 dimensions: use of scientific bibliography, understanding of the topics covered, management of citations and paraphrasing, and grammatical and spelling quality in the writing of academic texts, each with 3 items. The measurement of the relationship of these variables was adapted to the method used by (Alfaro et al., 2021), where the focus of the context of virtual dynamic technology was added to student learning.

Data collection was carried out through a Likert scale survey, using a semi-structured questionnaire that assessed the achievement of academic competencies through the use of dynamic digital formative research techniques. The instrument had four alternatives for each statement: always = 4, sometimes = 3, almost never = 2 and never = 1. This questionnaire was validated by 2 experts in pedagogy with a doctorate degree and are university professors and 2 experts in scientific research with a doctorate degree, also teachers, in order to validate the content of the instrument. In addition, the reliability of the instrument was evaluated using Cronbach's alpha coefficient, obtaining a result of 0.7, within an acceptable range.

To collect the data, it was initially coordinated with the directors of the professional schools to facilitate the application of the instrument. Subsequently, all the professional schools of the three training areas were visited during rest or recess hours, both in the morning and afternoon shifts. A random probabilistic collection method was used, adjusted to the proportion corresponding to each professional school, with the criterion that the students have completed at least two academic semesters. Prior to administering the questionnaire, a protocol was provided requesting the collaboration of students and ensuring the confidentiality of the information collected to ensure the sincerity of the responses, especially in the context of formative research in the digital age.

The data collected were analyzed using inferential statistics. According to Hernández et al. (2014), inferential statistics is used to test hypotheses and estimate parameters. In this study, Spearman's Rho statistical test was applied to obtain results that were aligned with the objectives set out in the problem statement and to respond to the research objectives formulated in the study.

*Analysis and Discussion of Results*

The following pages present the demographic information table and correlation tables of the variables studied in accordance with the purposes of the research, which are detailed below:

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**Table 1.** Sociodemographic Information of the Participants

| | | | Area to which the professional school belongs. | | | |
|---|---|---|---|---|---|---|
| | | | Social | Biomedical | Engineering | Total |
| Gender of the student | Female | f | 93 | 32 | 35 | 160 |
| | | %. | 57,1% | 59,3% | 21,2% | 41,9% |
| | Male | f | 70 | 22 | 130 | 222 |
| | | % | 42,9% | 40,7% | 78,8% | 58,1% |
| Total | | f | 163 | 54 | 165 | 382 |
| | | % | 100,0% | 100,0% | 100,0% | 100,0% |

Table 1 shows the participation of students in the study of the three areas of vocational training, with 160 women and 222 men who took part in the study. This represents 41.9% and 58.1% respectively. From the area of Social Sciences, 163 students participated, 54 from Biomedicine and 165 from Engineering, with representation of both sexes. Most students come from rural areas, who in some way may have limitations regarding access to technology and connectivity.

**Table 2.** Relationship Between Formative Research And Academic Competence

| | | | Formative Research | Competence_ academic |
|---|---|---|---|---|
| Spearman's Rho | Formative Research | Correlation coefficient | 1,000 | ,469** |
| | | Sig. (bilateral) | . | ,000 |
| | | N | 378 | 377 |
| | Competence academic | Correlation coefficient | ,469** | 1,000 |
| | | Sig. (bilateral) | ,000 | . |
| | | N | 377 | 381 |
| **. The correlation is significant at the 0.01 level (bilateral). | | | | |

Table 2 illustrates the general result of the relationship between the variables Formative Research in the Digital Context and Academic Competence. A moderate positive relationship ($r = 0.469$) with a significance ($p$ value $= 0.00 < 0.05$) is observed, which suggests that the greater the use of formative research techniques using digital dynamic methods, the better the academic competence of the students of the National University of the Altiplano.

Formative research involves the use of a set of pedagogical techniques that facilitate the optimal development of university students' academic competencies. These techniques allow them to acquire research skills that contribute to internalizing structures of thought and action for problem solving (Landazábal et al., 2010). In this context, technology has the potential to improve various educational tools, such as personalized learning, adaptive assessments, intelligent tutoring systems, automated grading, virtual and augmented reality in education, etc. (Beaulac & Rosenthal, 2019).

The general results obtained demonstrated that the didactic techniques of formative research, by employing dynamic educational technologies, allowed the use of relevant academic bibliography to elaborate academic works, such as monographs, theoretical essays, problem-based research and case studies developed in the learning process. In these works, credit recognition was put into practice, quoting authors directly or indirectly. In addition, acceptable grammar and spelling were evidenced in the preparation of the documents. However, the learning of the topics covered is not attributed to formative research, possibly other factors must intervene in this.

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The study coincides with the results obtained by Alfaro et al. (2021), who found a direct and significant relationship between formative research variables and the achievement of academic competencies in students of the Universidad Nacional de Educación during the 2020 academic cycle. This indicates that, motivated by the desire to delve deeper into the topic through the use of interactive resources, such as social networks and others, the students were able to develop their academic skills. To support this study, Corral et al. (2021) carried out an experiment of a new learning method through interactive applications in the mechanical engineering subjects of the Universidad Carlos III of Madrid, using e-learning techniques and new technologies. The results showed significant support for students, with a marked improvement in the pass rate (from 15% to 38%) and high satisfaction with the method (89%). Thus, dynamic virtual technology helps students acquire twenty-first-century skills, including communication, collaboration, creativity, critical thinking, and problem-solving (Van Laar et al., 2017). In this way, educational didactic technology provides tools to analyze and evaluate the development of students' activities, as well as their best learning.

**Table 3.** Relationship Between Formative Research And The Dimension Of Use Of Scientific Bibliography

| | | | Formative Research | Use of scientific literature |
|---|---|---|---|---|
| Spearman's Rho | Research Formative | Correlation coefficient | 1,000 | ,544** |
| | | Sig. (bilateral) | . | ,000 |
| | | N | 378 | 377 |
| | Use of scientific literature | Correlation coefficient | ,544** | 1,000 |
| | | Sig. (bilateral) | ,000 | . |
| | | N | 377 | 381 |
| **. The correlation is significant at the 0.01 level (bilateral). | | | | |

Table 3 shows the relationship between the Formative Research variable and the scientific bibliography use dimension of the Academic Competence variable. A direct and strong relationship (r = 0.544) with a significance (p value = 0.000 < 0.05) is observed, which indicates that as the use of dynamic digital didactic techniques in formative research increases, the use of adequate scientific bibliography by university students improves.

Educational technology facilitates the student's access to relevant and up-to-date information, capitalizing on the students' experience in this area. By training the student with the necessary digital skills, the gap between education and the world of work is reduced, making students more employable and contributing more effectively to real-world projects (Valbuena-Bermúdez et al., 2024). The results of the study are aligned with the research of Salazar and Heredia (2019), who point out that the use and interpretation of information explain the level of academic performance. In other words, the more importance is given to the management of bibliographic information resources, the more the level of academic competence will be explained. In this context, Villa and Poblete (2007) highlight in their study that, by placing the student as an active protagonist of their own competency-based learning process, better learning is achieved. This implies that the easier access to scientific bibliography, whether through platforms such as SciELO, Redalyc, ScienceDirect, Wiley or through tools such as Research Rabbit, the better the development of academic competencies, since students will be able to analyze, interpret, systematize and critique updated topics.

**Table 4.** Relationship Between Formative Research and the Learning Dimension of Topics Covered in Classes.

| | | | Formative Research | Learning topics covered |
|---|---|---|---|---|
| Spearman's Rho | Research Formative | Correlation coefficient | 1,000 | ,069 |

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| | | | | |
|---|---|---|---|---|
| | | Sig. (bilateral) | . | ,180 |
| | | N | 378 | 378 |
| | Learning topics covered | Correlation coefficient | ,069 | 1,000 |
| | | Sig. (bilateral) | ,180 | . |
| | | N | 378 | 382 |

According to Table 4, there is no relationship between formative research and the learning dimension of topics covered in classes, according to the academic competence variable. This lack of relationship suggests that the formative research techniques studied are not linked to the learning of the topics in the classrooms.

This result points to the absence of correlation between formative research techniques and the learning of the topics covered, which could be attributed to the lack of coordination and dynamic communication between them. In this context, Lozano-Blasco et al. (2023) determine that social networks represent new ecosystems of relationships between young people that could contribute to overcoming this gap, as they encourage the critical analysis of information and define spaces where values and ideologies can be shared. However, this result contradicts the finding of García et al. (2018), who indicated that, through the use of didactic strategies in the development of topics such as information gathering, research seminar and monograph, it was possible to enhance learning and communication skills in university students. In addition, Baños et al. (2024) used the problem-based learning technique using simulation resources with robotic patients and/or standardized patients, where learning was interactive, multidisciplinary, and effective, including immediate and medium-term feedback, which brought the student closer to the reality of clinical practice.

In this sense, the learning of the topics covered through dynamic didactic methodologies through digital platforms can contribute to the better development of students' academic competencies, according to the authors.

**Table 5.** Relationship Between Formative Research and the Dimension of Use of Quotations and Correct Spelling in the Text.

| | | | Formative Research | Use of Citations and Paraphrasing in Academic Works |
|---|---|---|---|---|
| Spearman's Rho | Research Formative | Correlation coefficient | 1,000 | ,400** |
| | | Sig. (bilateral) | . | ,000 |
| | | N | 378 | 377 |
| | Use of Citations and Paraphrasing in Academic Works | Correlation coefficient | ,400** | 1,000 |
| | | Sig. (bilateral) | ,000 | . |
| | | N | 377 | 381 |
| **. The correlation is significant at the 0.01 level (bilateral). | | | | |

Table 5 shows a relationship between the formative research variable and the dimension use of citations and paraphrasing in academic works of the academic competence variable. This result exhibits a moderate ($r = 0.400$) and significant (p value $= 0.000 < 0.05$) relationship, which indicates that as the use of dynamic didactic techniques in formative research increases, the appropriate use of the sources consulted improves and the corresponding credit is granted.

The academic texts reflect the critical analysis and reflection of the students on the topics discussed in class, where the authors consulted are quoted both directly and paraphrased. In this context, virtual teaching techniques in education have facilitated the development of more effective learning skills in this regard (Mousavinasab et al., 2021). This study aligns with the findings of Valle et al. (2022), who demonstrated a

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direct relationship between formative research and written communication and problem-solving skills, where the sources consulted are correctly used and recorded as citations. In addition, Urh et al. (2015) implemented the gamification strategy in e-learning in higher education, which included active learning techniques, student collaboration, time spent on homework, and feedback. The result of the experiment surpassed that of traditional education. In this way, dynamic didactic techniques supported by educational technology contribute to better student learning and, therefore, to their academic competence, reflected in their academic work.

**Table 6.** Relationship Between Formative Research and the Grammar Dimension in Text Writing

| | | | Formative Research | Grammar and Spelling in Academic Works |
|---|---|---|---|---|
| Spearman's Rho | Formative Research | Correlation coefficient | 1,000 | ,410** |
| | | Sig. (bilateral) | . | ,000 |
| | | N | 378 | 377 |
| | Grammar and Spelling in Academic Works | Correlation coefficient | ,410** | 1,000 |
| | | Sig. (bilateral) | ,000 | . |
| | | N | 377 | 381 |

**. The correlation is significant at the 0.01 level (bilateral).

Table 6 reveals a relationship between the formative research variable and the correct grammar and spelling dimension in the writing of academic texts. The result indicates a moderate ($r = 0.410$) and significant ($p$ value $= 0.000 < 0.05$) direct relationship. This implies that the more dynamic didactic techniques are applied through various digital platforms in formative research, the better the grammar and spelling will be in the writing of academic texts.

This relationship between formative research and the quality of grammar and spelling in academic writing is supported by previous studies. For example, Gonzáles (2006) highlights didactic strategies such as the seminar and the writing exercise in essays and articles to enable the development of academic competencies. However, it would be even more beneficial to apply dynamic didactics to develop these academic competencies, as indicated by Wodzicki et al. (2012), who point out that students who use social media platforms can connect to formal and informal learning spaces to satisfy group and individual intellectual needs. In addition, Pinos et al. (2021) highlight that dynamic teaching techniques strengthened students' writing, allowing them to improve their spelling deficiencies.

In this way, formative research in the digital context through various virtual platforms can contribute significantly to improving the correct use of grammar and spelling in the writing of students' academic texts, such as monographs, essays and articles, promoting an autonomous criterion for the development of their academic skills.

Implications. The results of the study have important implications for improving students' academic competencies, evolving pedagogical approaches, equitable access to education, and preparing students for an increasingly digitalized work and social environment. Teachers should adapt their teaching methodology to a context of the use of didactic educational technologies, so that they can carry out continuous formative assessments, allowing faster and more accurate feedback, which can allow the early identification of learning difficulties and the implementation of corrective strategies in time. It also requires teachers to adopt roles more focused on facilitating and guiding learning, rather than simply transmitting knowledge.

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## Conclusions

Formative research through digital didactic techniques is directly related to the academic competence of students, that is, the more these dynamic formative research techniques are used through digital platforms, the better the academic competence of the students, reflected through their academic works, such as research monographs, theoretical essays, problem-based education and case studies, in which the knowledge acquired is analyzed, interpreted and systematized.

Formative research as a pedagogical strategy, employing dynamic techniques such as digital platforms, is directly associated with the appropriate use of sources and the correct attribution of credits to authors in the preparation of students' academic papers.

In addition, the use of dynamic teaching techniques supported by technology is closely related to the academic competence of students, since they develop their academic work taking into account the rules of grammar and spelling.

The study was carried out exclusively in a public university in Peru, which limits the generalization of the findings to other contexts, since the sample was concentrated in a single institution. In future research, it would be necessary to investigate why there is no relationship between the formative research variable and the learning of topics covered, as well as to expand the study population and use a representative sample that allows the results to be generalized to other contexts.

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