

## DEVELOPMENT OF INVESTIGATIVE SKILLS FOR DIGITAL MEDIA IN UNIVERSITY STUDENTS

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### ABSTRACT

Research and technology are fundamental in the academic environment. This study aims to evaluate digital media research skills among university students. A systematic review was carried out following the PRISMA protocol guidelines, ensuring reliable data was obtained and minimizing bias. After examining 413 investigations in databases such as Scielo, Science Direct, DOAJ and Google Scholar, 22 were selected for the final analysis. The results indicate a low level of research skills in higher education. Furthermore, the importance of using technology as a support tool is highlighted, not as a replacement for the teacher's role. Recognizing this duality, a balanced approach is promoted that takes advantage of the advantages of technology while preserving the essence of traditional teaching.

**Keywords:** College students; digital media; educational technology; research skills; systematic review.

### INTRODUCTION

One of the most valuable elements that a society has are the people who make it up, therefore, the theory of human capital management supports the need to strengthen education, since knowledge, skills and educational competencies are invaluable components in people and contribute to increasing value in societies (Barros and Turpo, 2020).

However, in recent years, academic success at the university level has shown a precipitous decline in the teaching aspect; this is evidenced by the low rates of educational efficiency (Medina et al., 2018). Consequently, there was a collective concern among governments, which is why they turned to research as a possible solution, given that it provides an opportunity to explore the competencies and skills that can guide students to success in their professional lives and the advancement of the community (Cangalaya, 2020).

In the context of the above, the research process began to offer the possibility of continuous educational improvement that guarantees pedagogical development (Dáher et al., 2018); however, one of the limitations is the lack of fundamental knowledge and skills necessary to enter the field of research (Zárate, 2021).

Similarly, Maury et al. (2018) concluded that there is a lack of research skills that make it impossible to implement research; this fact establishes, as an outcome, a possible violation of the minimum requirements required to conduct scientific work.

Correspondingly, one of the main characteristics of society is the pursuit of continuous development of knowledge, which is why it urges universities to improve the quality of research by placing the student at the center of all learning (Cuentas, 2018); however, reality shows that students are not interested in research or its methodology, considering it a tedious process rather than an important one (Guzmán, 2021). Similarly, another aggravating factor is extra-university activities; one example is work, since the decline in the attitude toward research is based on the limited time available (Chara and Olortegui, 2018).

Thus, the development of scientific research has shown a low production in recent years, therefore, several researchers proposed virtualizing the research methodology course, so that with the help of technology the research culture can be strengthened (Fernández et al., 2022); however, not all university professors have a clear conception of the teaching of research, therefore, scientific skills such as inquiry have a negative evaluation in students (Sosa and Dávila, 2018).

Therefore, the development of scientific capacities is required through investigative training and formative research, given that the former provides the theoretical tools and methodological knowledge, and the latter puts into practice the concepts learned by students without them yet becoming professionals; all of this is done with the aim of developing the students' investigative skills (Guamán et al., 2021).

In this sense, one of the tools that enables research capabilities to be enhanced is technology, as it fosters distance learning where the student is the main focus of their learning (Valencia, 2021). In this regard, the development and use of technology could be an element that could strengthen research skills.

## METHODOLOGY

The purpose of this research is to gather accurate, meaningful, and transparent information on the development of university students' digital media research skills. Therefore, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were used. This methodology, through a process of identification, selection, and screening, provides reliable data that allows for credible conclusions to be drawn with a low probability of bias.

Likewise, inclusion and exclusion criteria were used to obtain data, as shown in Table 1; additionally, a keyword search strategy was used in the various databases used.

Table 1

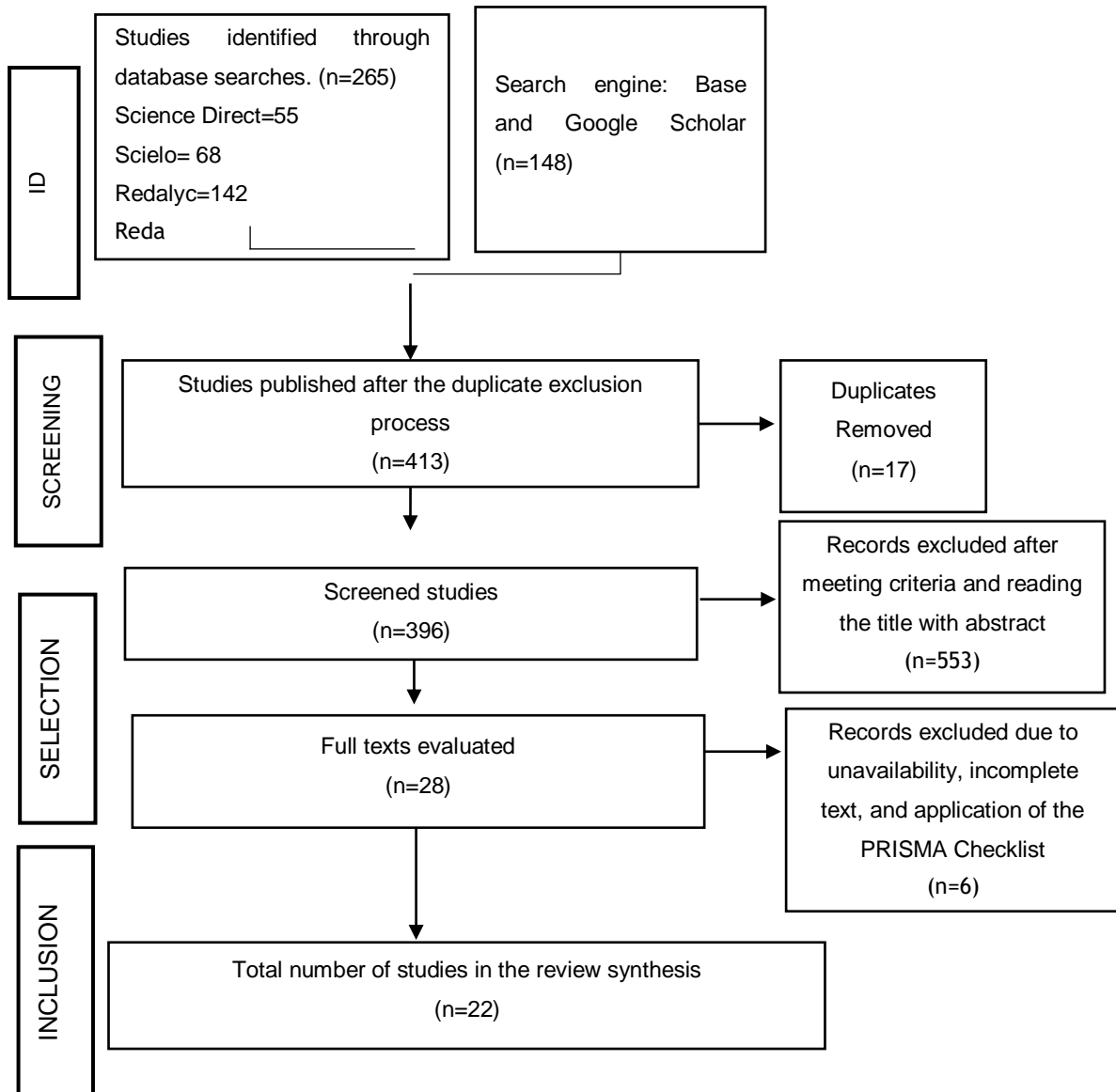
Inclusion and exclusion criteria.

Criteria	Inclusion	Exclusion
Publication Date	Articles published between 2018 and 2023	Articles published outside the years 2018 and 2023
Type of research	Original research that is published or in the process of being published	Review research, meta-analysis, undergraduate or graduate theses, conferences and essays.
Affordability of the item	Articles that are complete and have free access to them	Articles that are fully complete and those that are subject to paid access.
Database	Articles found in Scielo, Doaj and Science Direct	Articles not found in Scielo, Doaj and Science Direct
Search Engine	Articles found in Google Scholar, as well as all search terms found within their title	Articles that are not found in Google Scholar, as well as those whose search terms are not found in the title
Main topic of the article	Articles that relate to or focus on the topic studied	Articles that are not related to or focused on the research topic.

**Search strategy:**Data collection was conducted in three databases: Scielo, Doaj, and Science Direct; the Google Scholar search engine was also used. The word combinations that yielded the best results were: (((university students) + (Research) + (Competencies))) and (((Higher Education) + (research) + (ICT))).

**Chart 1.**

Flowchart



## RESULTS

Table 2  
Articles included in the systematic review

AUTHOR	YEAR	COUNTRY	DESIGN	PURPOSE	CONCLUSION
Chara and Olortegui	2018	Peru	Descriptive correlational	Determine the factors associated with university students' aptitude for research.	Students who work longer hours and read fewer books and articles per week have an unfavorable attitude toward research.
Castro, Sihuay and Perez	2018	Peru	Quantitative descriptive retrospective type	To determine the level of scientific production of university dentistry students.	Scientific production is very low due to the limited skills and knowledge they possess.
Rodríguez, Ibarra and Cubero	2018	Spain	Quantitative of the descriptive type	Analyze and describe students' perceptions of their core study and research skills.	Students' assessment skills are low, given their lower level of reflection and autonomy.
Figueroa, Granados and López	2019	Mexico	Quantitative of the comparative descriptive type	To compare performance in research competitions between students who took research methods with those who did not.	The Research Methods course promotes the development of research skills; however, it should not be considered the only empowering strategy, as it does not cover all fields of research.
AUTHOR	YEAR	COUNTRY	DESIGN	PURPOSE	CONCLUSION
De la Cruz, Correa, del Socorro and Sanchez	2019	Peru	Quantitative of the comparative descriptive type	Describe the influence of the application of a research workshop.	Nearly 95% of the sample did not have the skills, abilities, or experience to write a thesis or article appropriately.
Ruiz	2019	Colombia	Empirical and interpretive	Analyze the formative assessment that students carry out among themselves on their	Formative assessment among students enhances problem-solving and the ability to make argumentative judgments.

				research skills.	
Garrido et al.	2019	Spain	Quasi-experimental	Analyze the impact of technologies on the development of analysis and synthesis.	The use of technological material in education improves the analysis and synthesis of university students.
Paredes and Moreta	2020	Ecuador	Quantitative Empirical	Determine attitudes toward research and how it influences self-regulation of learning.	Attitudes toward research have significant potential in the cognitive factor, of which this is decisive in self-regulation of learning.
Sánchez, Herrera and Sánchez	2020	Venezuela	Qualitative of the descriptive type	To investigate university students' resistance to their involvement in research activities.	University students' resistance to participating in educational activities stems from a divide between the theory taught by teachers and the reality of their practices.
AUTHOR	YEAR	COUNTRY	DESIGN	PURPOSE	CONCLUSION
Ruiz et al.	2020	Mexico	Quantitative of the descriptive type	To assess the self-perception of research competencies and skills in university students.	There is a high level of positive perception of research competencies, however, in team research work, less than half approved.
Figueroa, Velásquez, Granados and Ríos	2020	Mexico	Descriptive quantitative type	Identify and describe what research competencies are in university students.	Among the results obtained, it can be concluded that women are the ones who possess greater research skills.
Sajmolo, Pineda, Ortiz, Salazar, Coti, Gaitán and Meneses	2020	Guatemala	Descriptive quantitative type	To determine the use of virtual communities as a research tool by postgraduate university students.	Most students use social media as a technological means of entertainment, but they also consider it a potential platform for scientific dissemination.
Cruz, Pinedo and Lezcano	2021	Peru	Descriptive non-experimental	Measuring university students' attitudes toward research.	Students are not considering research as relevant.

Espinosa and Rojas	2021	Mexico	Non-experimental quantitative	To explore the knowledge and motives that university students have regarding the completion of a research thesis.	Personal interest, skills, and belief system about research are necessary and fundamental to research motivation.
AUTHOR	YEAR	COUNTRY	DESIGN	PURPOSE	CONCLUSION
Quispe	2021	Peru	Mixed sequential explanatory design	To verify the influence of the application of ethnographic research in order to develop research skills	The methodology of ethnographic research develops research skills in early childhood education students.
Vera et al.	2021	Cuba	Observational, descriptive	Describe the level of self-assessment of existing research skills in students	Research skills show linear growth according to the university level you are in.
Cabanillas, Luengo and Carvalho	2021	Spain	Qualitative-Descriptive	Determine the changes produced in learning towards research from the use of ICT	ICTs are conducive to opening up communication and data analysis.
Campos and Ramírez	2021	Mexico	Quantitative of correlative type	Determine the factors that inhibit the use of ICT in educational research processes	The insufficiency of the economic factor is the main element that prevents the employability of ICT for research.
Delgado, Chamba, Cuenca and Ancajima	2022	Ecuador	Mixed with an inductive-deductive approach	To understand the influence of Padlet as a research dissemination tool.	The media are an important tool for disseminating research.
AUTHOR	YEAR	COUNTRY	DESIGN	PURPOSE	CONCLUSION

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Zárate, Lavado, Pomahuacre, Sánchez, and Mendoza	2022	Peru	Descriptive quantitative	Demonstrate the degree of relationship between teacher performance and research training in university students	Teacher performance is significantly related to the quality of research training in students.
Pacheco, Mayorga, Cordova and Navas	2022	Ecuador	Descriptive quantitative type	Analyze the impact on the development of research skills in higher education students	The main trainers of research competencies and skills in university students are teachers.
Flores, Tovar, Homero, Villar and Villegas	2022	Peru	Descriptive of the correlational type	Determine the relationship between research strategies and teacher training	Research strategies have a statistically significant relationship with the pedagogical training of university students.

## DISCUSSION

According to the results obtained from the various investigations found, it was shown that a large part of the student population has a low level of competencies and skills directed towards research (De la Cruz et al., 2019), this is ratified by the research of Castro et al. (2018) who mentioned that the low scientific production is a product of the limited skills and knowledge that students possess.

Similarly, Rodríguez et al. (2018) pointed out that the low existing research competencies are due to the scarce reflective capacities; however, the aforementioned is differed by Ruiz et al. (2020) who stated that there is a high and positive perception towards research, this as a result of students' self-impression of their knowledge.

On the other hand, one of the main elements that works as a tool to enhance research turns out to be technology, this is confirmed by Cabanillas (2021), who stated that the application of information and communication technologies becomes fruitful for the development of research skills. This is ratified in the study by Garrido (2019) who pointed out that technological material in education strengthens students' analysis and synthesis; skills that are essential in the research process.

Additionally, Sajmolo (2020) differs from the aforementioned, since in his study he concluded that technology, currently, does not imply an immediate improvement in research skills, because most university students use it for social media and personal entertainment.

Furthermore, it has been shown that research skills are strengthened through collaborative work between the student and the educator, given that teacher performance is significantly related to the student's research training (Zárate et al., 2022); this validates the study by Vera et al. (2021), who concluded that the acquisition of research habits and skills occurs in a linear fashion according to the university degree held.

However, Pacheco et al. (2022) pointed out that the main trainers of the skills necessary for research are teachers, while Paredes (2020) contradicts the above, because he considers self-regulation of learning as the most determining factor in learning to research.

## CONCLUSIONS

The results obtained from the systematic literature review reveal a low level of research skills in higher education; a clear example of this is the scarcity of quality scientific publications in recent years, a result of students' lack of interest in research.

In this sense, to strengthen the research culture, the necessary habits and concepts must be generated through the triad of teachers, students, and technology. The latter is consolidated as a tool that enhances research skills, the latter is the center of learning, and the former is the guide for teaching.

Furthermore, one of the challenges facing promoting research skills in students is the existing technological gap, as it hinders access to various benefits and facilities that foster a research culture. Therefore, it is recommended that this topic be addressed in future research.

It is also important to note that the limited data focused on research involving technology was a limitation, given that most researchers consider it inherent to the activity. Therefore, it is not considered a topic of study. However, the results obtained demonstrate that its use is valid for developing research skills.



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