ASSESSMENT OF RESEARCH COMPETENCES IN UNIVERSITY STUDENTS FROM THE PERUVIAN AMAZON: A CROSS-SECTIONAL STUDY

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ABSTRACT

Objective: In the university context, research competences acquire a transcendental role for the integral development of students and the advancement of knowledge in all academic disciplines. Therefore, the objective of the present research was to evaluate the research competences of students of the Peruvian Amazon universities who attend the ninth and tenth semester.

Method: The investigation was developed under a quantitative approach; the design was non-experimental and the type was cross-sectional descriptive. The sample was made up of 135 students to whom the Research Competences Questionnaire was administered, an instrument with an adequate level of validity and reliability.

Results: According to the results, the level of development of the research competences of 43.7% of students were low, of 37% was medium, while 19.3% was high. Likewise, the organizational competences, communicational competences and collaborative competences dimensions were also valued at a low level. On the other hand, it was found that the level of research competencies was significantly associated with the semester of study in which the students were (p<0.05).

Conclusions: It was concluded that the level of development of the research competences that characterized students was low. Therefore, it is recommended that the competent university authorities promote a culture of research in the academic environment and provide specific research training programs.

Keywords: research competences, training research, university students, research culture, scientific research.

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RESUMO

Objetivo: No contexto universitário, as competências investigativas adquirem um papel transcendental para o desenvolvimento integral dos estudantes e o avanço do conhecimento em todas as disciplinas acadêmicas. Portanto, o objetivo da presente pesquisa foi avaliar as competências investigativas dos estudantes das universidades da Amazônia Peruana que frequentam o nono e décimo semestre.

Método: A pesquisa foi desenvolvida sob uma abordagem quantitativa; o desenho foi não experimental e o tipo foi descritivo transversal. A amostra foi composta por 135 estudantes aos quais foi administrado o Questionário de Competências Investigativas, um instrumento com um nível adequado de validade e confiabilidade.

Resultados: De acordo com os resultados, o nível de desenvolvimento das competências investigativas de 43,7% dos estudantes foi baixo, de 37% foi médio, enquanto 19,3% foi alto. Da mesma forma, as dimensões de competências organizacionais, competências comunicacionais e competências colaborativas também foram avaliadas em um nível baixo. Por outro lado, verificou-se que o nível de competências investigativas estava significativamente associado com o semestre de estudo em que os estudantes se encontravam (p<0,05).

Conclusões: Concluiu-se que o nível de desenvolvimento das competências investigativas que caracterizavam os estudantes era baixo. Portanto, recomenda-se que as autoridades competentes da universidade promovam uma cultura de pesquisa no ambiente acadêmico e fornecem programas de treinamento específicos em pesquisa.

Palavras-chave: competências investigativas, treinamento em pesquisa, estudantes universitários, cultura de pesquisa, pesquisa científica.

1 INTRODUCTION

At present, scientific research is a fundamental pillar in universities (Estrada et al., 2022). It is considered a mandatory process that seeks to address the problems and needs of society through the production of knowledge and the development of technologies (Mercado, 2019; Estrada et al., 2023). Thanks to research, universities can generate innovative solutions that contribute to the progress of the science and well-being of the community. Therefore, universities must promote research competences in students (Arzuaga et al., 2023; Morales et al., 2023).

Research competences include a set of knowledge, skills and essential attitudes for effective performance in the research process (Buendía et al., 2023). These skills are
fundamental for a university student to carry out research, either for their final work, academic thesis or in future professional career (Ríos et al., 2023). Its development requires both curricular and extracurricular teaching strategies, allowing the student to cultivate and strengthen these skills through practice (Castro, 2020). Likewise, it is stated that research competences allow the student to acquire abilities related to inquiry, criticism, observation, understanding, abstraction, information search, information analysis, dissemination and communication, among others (Castro, 2021).

Then, the need arises to promote research competences in students from universities, which must be developed from the transversality in academic programs, in order to ensure that they can respond to the constant changes that society lives (Chávez et al., 2022). For this, the necessary supplies must be guaranteed so that students can think critically and reflect on situations they face (Castro, 2023). In this way they can understand the problems, manage the information and handle it so that it can obtain what is necessary to establish solution alternatives (Tobón, 2010).

To strengthen research competences, it is essential to promote both training and practical research. The experience of investigating allows students to cultivate the passion for research. In this sense, the role of the teacher is fundamental, since it must facilitate the active participation of students in research projects, promote the exchange of ideas and offer them help when necessary. Likewise, the teacher must get used to the inquiry and construction of knowledge, serving as a model for students to emulate their actions. All this must be carried out maintaining ethical principles that enrich the teaching-learning process in research (Castro, 2023).

Various research has been carried out to determine the level of development of the research competencies of university students and the results are heterogeneous. This is due to the intervening sociodemographic variables and the academic conditions from which the data were obtained. In that sense, some investigations determined that the students' research competencies were at a low level (Dipas et al., 2022; Alfaro et al., 2022), while other investigations reported that they were at a regular or intermediate level (Ayala, 2020; Núñez, 2019).

Investigations on research competences in university students is of vital importance due to its impact on the quality of higher education and the development of future professionals and scientists. Understanding the level of research competences of the students allows you to identify strengths and areas of improvement in their academic
training. The findings will allow to design specific training strategies and programs to strengthen their research skills, promoting critical thinking, scientific rigor and the ability to address complex problems in their field of study. In addition, improving research competences contributes to the generation of new knowledge, the solution of social problems and the progress in science and technology, positively impacting society in general.

Therefore, the objective of this research was to evaluate the research competencies of the university students of the Peruvian Amazon who were attended by the ninth and tenth cycle of study.

2 METHODOLOGY

A quantitative approach was used, since it was based on numerical measurement and the use of statistics to determine the behavior patterns of the participants. Regarding the design, it was non-experimental, since the variable research competences was not deliberately manipulated, it was only observed. In relation to the type, it was descriptive and cross-sectional, because the analysis of the characteristics of the variable was developed and because the data collection was carried out at a single moment (Hernández & Mendoza, 2018).

The population was constituted by 208 students who were attending the ninth and tenth semester of studies in universities that provide educational service in the Madre de Dios region, Peru: Universidad Nacional Amazónica de Madre de Dios (UNAMAD) and the subsidiaries of the Universidad Andina del Cusco (UAC) and Universidad Nacional de San Antonio Abad del Cusco (UNSAAC). On the other hand, the sample was made up of 135 students, an amount that was obtained through a stratified probabilistic sampling with a 95% confidence level and a level of significance of 5%. Of the total number of participants, 57% were female and 43% were male. Regarding the study cycle, 52.6% were in the ninth semester and 47.4% in the tenth semester. In relation to the University of origin, 48.9% came from UNAMAD, 35.6% of the UAC and 15.5% of UNSAAC.

Table 1. Sociodemographic and academic characteristics of the sample

<table>
<thead>
<tr>
<th>Variables</th>
<th>n= 135</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>58</td>
<td>43.0</td>
</tr>
<tr>
<td>Female</td>
<td>77</td>
<td>57.0</td>
</tr>
<tr>
<td>Semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ninth</td>
<td>71</td>
<td>52.6</td>
</tr>
<tr>
<td>Tenth</td>
<td>64</td>
<td>47.4</td>
</tr>
<tr>
<td>University of origin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNAMAD</td>
<td>66</td>
<td>48.9</td>
</tr>
</tbody>
</table>
Data collection was given through the use of a virtual survey structured in Google Forms, which was made up of two sections. In the first section, sociodemographic and academic information (gender, semester and university of origin) were collected.

In the second section the Research Competences Questionnaire was applied, which was prepared by Romaní (2022). It consists of 43 Likert type items (never, almost never, sometimes, almost always and always) and distributed in 3 dimensions: organizational competences (items from 1 to 12), communicational competences (items from 13 to 36) and collaborative competences (Items from 37 to 43). The psychometric properties of the questionnaire were determined through the validity processes (V of Aiken = 0.920) and reliability (α = 0.890). In that sense, it was concluded that the questionnaire was valid and reliable.

Before carrying out data collection, the necessary procedures were implemented to obtain the authorizations of relevant university authorities. Subsequently, the WhatsApp messaging application was used to invite students to participate in the research. To do this, they were provided with the survey link together with a clear explanation of the purpose of the investigation and the instructions to complete the questionnaire. The full process took approximately 15 minutes, and once the participation of the 135 students was secured, access to the questionnaire was deactivated.

To carry out the statistical analysis, the SPSS Software version 25 was used. The descriptive results were presented in four figures, while the inferential results were obtained by applying the Chi-Square nonparametric test ($X^2$). This statistical test allowed us to determine whether there was a statistically significant association between the level of research competencies and the proposed sociodemographic and academic variables.

In relation to ethical considerations, this investigation was carried out considering the ethical principles established in the Helsinki statement and was supported by the Institutional Ethics Committee. It is necessary to point out that students were informed about the purpose and nature of the research. Therefore, they provided their informed consent, thus ensuring privacy, confidentiality, anonymity and voluntary nature of their participation.
3 RESULTS AND DISCUSSION

Figure 1 shows that the level of development of the research competences of 43.7% was low, 37% was medium and of 19.3% was high. These results indicate that students are characterized by having difficulties or limitations in terms of their skills, knowledge and capacities to carry out research papers effectively and rigorously. This could affect their ability to do good quality research and obtain precise results.

![Figure 1. descriptive results of the research competencies variable](source: Own creation)

Figure 2 can see that the level of development of organizational competences dimension of 46.7% of students was low, 36.3% was medium and 17% was high. As for communicational competences dimension, the level of development of 43% of students was low, 37.8% was medium and 19.3% was high. In relation to collaborative competences dimension, the level of development of 40.7% of students was low, 37% was medium and 22.2% was high. It is observed that in all cases the predominant level was low, which indicates that students have difficulties or limitations in these specific areas, a situation that could affect their academic performance, their ability to carry out projects or team work, and in last instance, their preparation for the professional future.
Figure 2. Descriptive results of the dimensions of the research competencies variable

Source: Own creation

According to Table 2, the level of research competencies reported by students was not significantly associated with gender (p>0.05). This means that gender does not seem to influence students' ability to plan and execute research. Both men and women have a similar level of research competencies.

<table>
<thead>
<tr>
<th>Sociodemographic variable</th>
<th>Research competencies</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>f  %</td>
<td>f  %</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>25 43.1</td>
<td>22 37.9</td>
</tr>
<tr>
<td>Female</td>
<td>34 44.2</td>
<td>28 36.4</td>
</tr>
</tbody>
</table>

Source: Own creation

According to Table 3, the level of research competencies presented by the students was significantly associated with the semester they were studying (p<0.05). This suggests that as students advance in their academic training, they are likely to improve their research competencies. In summary, academic progress offers students more opportunities for learning, practice and skills development in the field of research. Then, the combination of disciplinary knowledge, practical experience and the support of teachers and researchers can contribute to the progressive improvement of their research competencies throughout their studies.

Table 3. Association between levels of research competencies and the academic semester of the students

<table>
<thead>
<tr>
<th>Sociodemographic variable</th>
<th>Research competencies</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>f  %</td>
<td>f  %</td>
</tr>
</tbody>
</table>

Source: Own creation
According to Table 4, the level of research competencies reported by the students was not significantly associated with the university where they studied (p>0.05). This suggests that regardless of the institution where they study, students have a similar level of research competencies.

<table>
<thead>
<tr>
<th>Academic variable</th>
<th>Research competencies</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>UNAMAD</td>
<td>30</td>
<td>45.5</td>
</tr>
<tr>
<td>UAC</td>
<td>20</td>
<td>41.7</td>
</tr>
<tr>
<td>UNSAAC</td>
<td>9</td>
<td>42.9</td>
</tr>
</tbody>
</table>

Source: Own creation

In university education, research competencies play a fundamental role for the academic and professional development of students. These skills and abilities allow students to address complex problems, analyze critical information and generate knowledge. Therefore, this research sought to evaluate the research competencies of the university students of the Peruvian Amazon who were attending the ninth and tenth semester.

A first finding indicates that students were characterized by presenting low levels of development of their research competencies. This implies that students show difficulties or limitations in their skills and knowledge related to research and can manifest themselves in the inability to ask appropriate research questions, design solid studies, collect and analyze data effectively or interpret the results of their research. This could affect their ability to do good quality research and obtain precise results.

Similar results were obtained in an investigation carried out in Peru, in which they found that the development of the research competencies of the majority of students were located at a low level (Dipas et al., 2022). In the same way, another investigation was also carried out in Peru where they found that all students presented a level of basic development of their research competencies (Alfaro et al., 2022). The exposed findings highlight the importance of addressing and strengthening these research competencies in the educational field to improve the quality of academic training and prepare students to face the challenges of the work and scientific world.
When analyzing the association between the level of research competencies and the academic variables, it was found that was only significantly associated with the semester that students were studying. This indicates that as students advanced in their academic career, they are likely to experience an increase in the development of their research competencies.

The described finding converges with what was reported in an investigation conducted in Slovenia, in which it was also found that the level of research competences was associated with the cycle of studies in which the students were. In that sense, it was found that the students of the first cycles had limitations regarding the development of research competences, which is due to the fact that the curriculum with the traditional basic courses did not contribute significantly in their development, while, in recent years, students were more likely to develop research competencies due to the nature of the courses (Dolničar & Boh Podgoronik, 2023).

Within the framework of the current investigative demands, it is relevant to enforce research competences in order to not only have theoretical contents or methodological criteria, but a domain of them to the search, selection, organization and analysis of indispensable information in the task of generating and disseminating knowledge (Garro et al., 2022). In this sense, it is pertinent to assess the research competences because they reveal the degree of domain of theoretical basis and the scientific methodology that students have in order to deal with the challenges presented in a knowledge society, from a practical, axiological, epistemological and entrepreneurial view, in a complex and interdisciplinary context (Tobón et al., 2015).

This research presents strengths when addressing a relevant knowledge in the university context. However, some limitations that must be considered were also identified. First, a disproportion was observed in the sample in relation to the number of students according to the University of origin. On the other hand, the use of a self-administered data collection instrument could generate subjective assessments by students and limit the generalization of findings. Therefore, for future research, it is recommended to increase the size of the sample, including a greater number of UNSAAC students. Likewise, the use of additional data collection instruments is suggested to provide more objectivity to this process.
5 CONCLUSIONS

Research competencies refer to the skills, knowledge and capacities that a person develops to carry out research in an effectively and rigorously. These skills are fundamental in academic, professionals and scientific environments, since they allow relevant questions, design adequate studies, collect and analyze data, interpret results and communicate findings clearly and consistently. In the university context it is important to promote the development of research competencies, since this not only improves the quality and reliability of the research carried out, but will also contribute to the advancement of knowledge.

In the present investigation it was determined that the level of development of the research competences of 43.7% of students were low, 37% was medium and of 19.3% was high. Likewise, the organizational competences, communicational competences and collaborative competences dimensions were also valued at a low level. On the other hand, it was found that the level of research competences was significantly associated with the semester in which the students were (p<0.05).

Therefore, it is recommended that the competent university authorities promote a culture of research in the academic environment. To do this, it is essential to implement a series of strategies and resources. First, training programs and workshops that specifically address research competencies, such as relevant questions, the selection of appropriate methodologies and the interpretation of results must be designed. In addition, it is vital to promote the active participation of students in research projects and facilitate interaction with experienced teachers and researchers, to provide guidance and mentoring. On the other hand, access to updated bibliographic resources must be provided to strengthen students' skills in this area. By offering an environment conducive to the development of research competencies, students will be better prepared to face academic and professional challenges, and will contribute significantly to the advancement of knowledge in their respective disciplines.
REFERENCES


