Research competencies assessment: Case of university students in the Peruvian Amazon

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Abstract 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. 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. 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). 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

1. Introduction

At present, scientific research is a fundamental pillar in universities (Estrada et al., 2022). Addressing the problems and needs of society through the production of knowledge and the development of technologies is considered mandatory (Mercado, 2019). Thanks to this 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 competence in students (Arzuaga et al., 2023).

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

Then, the need arises to promote research competence in students from universities, which must be developed from the transversality of academic programmes to ensure that they can respond to the constant changes that society lives (Chávez et al., 2022). For this purpose, 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).

For the development and strengthening of research competencies, it is essential to foster both formative and practical research. The experience of “researching while researching” allows students to cultivate an investigative spirit from the early stages of their professional education. In this sense, the role of university teachers is crucial, as they must facilitate the active participation of students in research projects, promote the exchange of ideas, generate research scenarios, and offer assistance when necessary. Likewise, the teacher must become accustomed to implementing their inherent action, inquiring
about and constructing knowledge, serving as a model for students to emulate. All of these steps should be carried out while maintaining coherence with ethical principles that enrich the teaching-learning process in research (Castro, 2023).

Various studies have 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 students' research competencies were low (Dipas et al., 2022; Alfaro et al., 2022), while other investigations reported that they were regular or intermediate (Ayala, 2020; Núñez, 2019).

Investigations on research competence in university students are vital due to the impact of such competences on the quality of higher education and the development of future professionals and scientists. Understanding the level of research competence among university students will allow for the identification of strengths and areas for improvement in their academic training. These findings will inform the design of specific strategies and training programs aimed at enhancing their research competencies, thereby fostering critical thinking, scientific rigor, and the ability to address complex issues in their field of study or professional development. Furthermore, improving research competencies will contribute to the generation of new knowledge, the resolution of social problems, and advancements in science and technology, ultimately benefiting society as a whole.

Therefore, the objective of this research was to evaluate the research competencies of university students in the Peruvian Amazon who were enrolled in the ninth and tenth cycles of study.

2. Materials and Methods

2.1. Design

A quantitative approach was employed, relying on numerical measurements and statistical analysis to determine participant behavior patterns in relation to the study variable. The design was nonexperimental, as the research did not deliberately manipulate the research competency variable; rather, it was observed. In terms of type, the survey was descriptive and cross-sectional, focusing on the characteristics of the variable, with data collection occurring at a single point in time (Hernández & Mendoza, 2018).

2.2. Participants

The population consisted of 208 students who were attending the ninth and tenth semesters of study at universities that provide educational services 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 composed of 135 students, an amount that was obtained through stratified probabilistic sampling with a 95% confidence level and a level of significance of 5%. Of the total participants, 57% were female and 43% were male. Regarding the study cycle, 52.6% were in the ninth semester, and 47.4% were in the tenth semester. In relation to the University of origin, 48.9% came from UNAMAD, 35.6% from UAC and 15.5% from 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>
<tr>
<td>UAC</td>
<td>48</td>
<td>35.6</td>
</tr>
<tr>
<td>UNSAAC</td>
<td>21</td>
<td>15.5</td>
</tr>
</tbody>
</table>

2.3. Instruments

The data were collected through the use of a virtual survey structured in Google Forms, which was composed of two sections. In the first section, sociodemographic and academic information (gender, semester and university of origin) was collected. In the second section, the Research Competences Questionnaire was applied; this questionnaire was prepared by Romani (2022). It consists of 43 Likert-type items (never, almost never, sometimes, almost always and always) distributed in 3 dimensions: organizational competences (items 1 to 12), communicational competences (items 13 to 36) and collaborative competences (items 37 to 43). The psychometric properties of the questionnaire were determined through validity (V of Aiken = 0.920) and reliability (α = 0.890). In that sense, it was concluded that the questionnaire was valid and reliable.

2.4. Procedure
Before carrying out the 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.

2.5. Data analysis

To carry out the statistical analysis, SPSS Software version 25 was used. The descriptive results are 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 competence and the proposed sociodemographic and academic variables.

2.6. Ethical aspects

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 note that the students were informed about the purpose and nature of the research. Therefore, they provided informed consent, thus ensuring the privacy, confidentiality, anonymity, and voluntary nature of their participation.

3. Results

Figure 1 shows that 43.7% of the participants had a low level of development in terms of their research competence, 37% had a medium level of development, and 19.3% had a high level of development. These results indicate that students are characterized by 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 perform good-quality research and obtain precise results.

![Figure 1 Descriptive results of the research competencies variable.](https://www.malque.pub/ojs/index.php/msj)

Figure 2 shows that 46.7% of the students had a low level of development in the organizational competences dimension, 36.3% had a medium level, and 17% had a high level. For the communicational competences dimension, 43% of the students had a low level of development, 37.8% had a medium level of development, and 19.3% had a high level of development. In relation to the collaborative competences dimension, 40.7% of the students had a low level of development, 37% had a medium level, and 22.2% had a high level. In all the 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 teamwork, and, ultimately, their preparation for the professional future.

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

According to Table 3, the level of research competence demonstrated by students was significantly correlated with their academic cycle ($p < 0.05$). This indicates that as students progress in their academic journeys, their research skills are likely to improve. In essence, academic advancement offers university students increased opportunities for learning, practice, and competency development in the realm of research. Therefore, the amalgamation of disciplinary knowledge, practical experience, and support from teaching and research faculty can contribute to the gradual enhancement of their research competencies throughout their academic tenure, encompassing the entirety of their educational journey.
According to Table 4, the level of research competence reported by the students was not significantly associated with the university where they studied (p>0.05). This finding suggested that, regardless of the institution where they study, students have a similar level of research competence.

Table 4 Association between levels of research competencies and the university of origin of the students.

<table>
<thead>
<tr>
<th>University of origin</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>

4. Discussion

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

A preliminary finding indicates that students were characterized by low levels of development in their research competencies. This suggests that students exhibit difficulties or limitations in their skills and knowledge related to research, which may manifest in the inability to formulate appropriate research questions, design robust studies, collect and analyze data effectively, or interpret the results of their investigations. Consequently, they may struggle to arrive at clear and precise conclusions, hindering their ability to make relevant recommendations for future research. The aforementioned factors could impact their capacity to produce high-quality research work and achieve accurate and compelling results.

Similar results were obtained in an investigation carried out in Peru, in which the development of the research competencies of the majority of students was found to be at a low level (Dipas et al., 2022). Similarly, another investigation was also carried out in Peru, where all students presented a level of basic development of their research competencies (Alfaro et al., 2022). The 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 competence and the academic variables, it was found that academic competency was significantly associated only with the semester during which the students were studying. This indicates that as students advance in their academic careers, 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 competence was associated with the cycle of studies in which the students were involved. In that sense, it was found that the students in the first cycle had limitations in terms of the development of research competences because the curriculum with traditional basic courses did not contribute significantly to their development; however, in recent years, students were more likely to develop research competencies due to the nature of the courses (Dolničar & Boh Podgornik, 2023).

Within the framework of the current investigative demands, it is relevant to enforce research competence to not only have theoretical content or methodological criteria but also to domain themselves into 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 to address 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).

Finally, strengthening research competencies beginning in the early stages of university studies is imperative, as it prepares students for the challenges of the academic and professional world, fosters critical and analytical thinking, and cultivates a culture of continuous learning that benefits both individuals and society as a whole. These skills not only are essential for addressing today’s complex issues but also promote innovation and progress in various fields. By developing a research mindset from an early stage, students become more curious and capable of formulating relevant questions and seeking solutions to real problems. This not only enhances their personal and professional development but also contributes to the advancement of knowledge and solutions to social, economic, and scientific problems, positively impacting society as a whole.

This research has strengths because it addresses relevant knowledge in the university context. However, several 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, increasing the size of the sample, which includes a greater number of UNSAAC students, is recommended. 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 effectively and rigorously. These skills are fundamental in academic, professional 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 also contributes to the advancement of knowledge.

In the present investigation, 43.7% of the students had a low level of development of research competences, 37% had a medium level of development, and 19.3% had a high level of development. Similarly, 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 competence was significantly associated with the semester in which the students were involved (p<0.05).

Therefore, competent university authorities are recommended to 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.

Ethical considerations
This investigation was carried out considering the ethical principles established in the Helsinki statement and was supported by the Institutional Ethics Committee.

Conflict of interest

The authors declare no conflicts of interest.

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References


