

Research Skills: From the Perspective of a Graduate Student at a Peruvian Public University

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Abstract

Nowadays the development of research skills is extremely important because the student is immersed in research; having it present at all educational levels, takes greater importance at the undergraduate and graduate levels, which is why it is necessary to conduct diagnostic studies to be able to know accurately the development of these skills. This article aimed to determine the level of research skills of graduate students at a Peruvian university. On the other hand, it was based on a quantitative, basic cross-sectional research with a non-experimental, descriptive design; it worked with a sample of 40 graduate students who are studying for the Master's Degree in Research and University Teaching, selected through a non-probabilistic sampling by convenience; to whom a questionnaire was applied to evaluate research skills. Finally, the results obtained showed that the highest percentage of the respondents is located within the high category at 90%, followed by a medium level with 10%, which confirms that the more students continue to study for their professional growth, the greater of development of their research skills.

Keywords: Epistemological dimension, students, research skills, problematizing and methodological.

1. Introduction

Talking about skills in this context of competence inserted in a changing world is relevant because graduate students are training to transform the context where they develop and need to apply the basic strategies of the research field in order to produce significant changes. It is important to evaluate research skills, given that the management of scientific knowledge is fundamental for a country to develop holistically, and they also suggest broadly measuring the skills that students acquire throughout the educational program [1].

UNESCO (United Nations Educational, Scientific and Cultural Organization) states that the training provided by higher education institutions should both respond to and anticipate societal needs. This includes promoting research for the development and use of new technologies and ensuring the provision of technical and vocational training, entrepreneurship education, and lifelong learning programs [2].

On the other hand, Chile's scientific production ranks fourth in Latin America, behind Brazil, Mexico, and Argentina; in these last three countries, the health area is the one that stands out with the highest number of scientific productions. However, in Chile, the areas with the highest production are biological sciences, biotechnology, urbanism, geology, agriculture, and political science [3].

In Argentina, the most visible phenomena of transformation of higher education during the last decades and so far, this decade have a global character but are of great national importance [4].

The increase in the creation of universities brought with it different opinions and significant quality problems became evident, where the training of humanists, scientists, and professionals of high academic quality, in

accordance with the needs of the country, the promotion of culture with a critical and creative sense, research in the humanities, sciences, and technologies, and the promotion of intellectual and artistic creation, took a back seat, as profit was imposed as the central objective of many universities created under the new regime [5].

In Peru, more than 70% of scientific production is carried out in private associative and public universities, but there are important gaps between them. Although there has been a significant increase in scientific production in universities, the production of publications at the national level represents only 2% of the total number of publications in Latin America. In short, Peruvian universities still face great challenges related to two of their most common objectives: professional training and knowledge production [6].

It is important to consider that low-income young people in Peru have fewer opportunities to access this level of education, but, given the low quality of basic education, it is not clear that these limitations are only financial and that the solution is therefore exclusively scholarships or educational credit [7].

Universities in Peru have to overcome the scholastic style of transmitting only information and are moving towards curricula based on the development of competencies, abilities, and skills required by a professional career. Institutions where research and teaching should form a unit of action to ensure that students interact with their own reality and the national reality [8].

In a study conducted with final-year engineering students at a private university in Lima, the findings reported that students have the strength to conceptualize and describe some research skills, giving little importance to methodology [9].

Another study reveals that the characterization of the development of research skills in students of a Peruvian university was low at 55.30%, followed by 36.05% with a medium level, while 8.64% indicated a high level. Therefore, it is considered that research capabilities, skills, and knowledge in scientific practice used in academic practice should be strengthened, as they are necessary for students to prepare them for their professional future, which will develop critical thinking and allow them to obtain information and self-learning skills [10].

Regarding the knowledge built for the development of skills and skills development is necessary and about healthy and sustained environments, the differences are more significant between doctoral students and master's students. These differences between the two groups are basically due to the experience obtained by doctoral students during their master's studies and their commitment to research [11].

Research skills are the set of systematic tasks that are executed in the exploration processes, which university teachers should possess for the solution of social problems, it is imperative that they are encouraged and promoted for the contribution to the development of science [12].

These skills constitute the basis for the development of research skills and attitudes, since they favor inquiry in the academic context, with a view to solving a given problem [13].

Thus, it can be defined as the set of abilities and skills that reflect the know-how of people in problem posing, researching in the literature review, analyzing the situation, establishing the search for alternatives, and formulating a concrete proposal for a solution [14].

In today's society, it is essential to have research skills. In addition to the obvious benefits for academic success, these skills have also been shown to have a positive impact on the professional performance of recent graduates, turning their work into an outstanding and effective practice for solving socially important problems [15].

Likewise, research skills are indispensable in academic activity. Their absence anticipates poor performance and a very low-quality academic-scientific production [16].

On the other hand, the systematic development of skills and abilities in students is a fundamental part of their stay at the university, maximizing them is of vital importance. Enhancing the development of thinking with academic activities, according to the current and innovative demands, so is necessary to put into action the processes of analysis, synthesis, reflection, decision-making, and a number of skills necessary for job performance in any field [17].

Research skills can be classified as follows [18].

Problematizing reality; refers to the researcher's approach to reality, inserting, knowing, understanding, and being able to analyze. The aim is to inductively raise the guiding questions and formulate the problem.

Theorize reality; it is worth mentioning that theory in qualitative research is referential, not determinant. The researcher generates theory and gives rise to knowledge. On the other hand, in the quantitative approach (it is a theoretical framework since it has a deductive method), the theory is verified, and it is related to other theories, focusing on statistics.

Verifying reality; refers to the confrontation of the problematic reality with the assumptions made, it is the synthesis of the research, which provides or verifies theory. It is the stage of evaluation and scientific alternatives of solutions to the problems of reality.

The dimensions to be considered in research skills are the following [19].

Epistemological dimension; This dimension is in charge of studying how scientific knowledge is produced, and what are its conditions of validity, so it is considered that the man of science must have the ability to know how information is incorporated, processed, and transformed into knowledge. Epistemological skills constitute cognitive and metacognitive characteristics of individuals that allow them to construct, validate and integrate knowledge to make decisions in the context of their professional reality [19].

Problematizing dimension; this dimension encompasses the ability of individuals to identify scientific problems where other people see nothing, it is related to their ability to problematize reality. It turns out to be a complex process, insofar as it requires people to have more knowledge about reality than the average person, which obliges the researcher to constantly inquire, to increase his knowledge, and to be able to detect conceptual contradictions between what is known and what he observes in reality [19].

Methodological dimension; this dimension articulates the elements of the research work, giving it the form needed to carry out the proposed work, in this context, is the consistency matrix, and the methodological route to follow. It involves the researcher's ability to articulate the elements of the research process through respect for the rules of conceptual, methodological, and scientific writing construction used in the development of scientific activity [19].

Instrumental dimension; this dimension involves the researcher's ability to apply the methods, techniques, and instruments that allow monitoring and evaluating the results of the research process, for their processing, organization, analysis, and interpretation [19].

On the other hand, five main investigative skills are defined: The ability to observe is a constant process where information about events, facts, or phenomena is acquired directly. The ability to describe consists of explaining events, facts, or phenomena in detail; it consists of examining the parts of a whole and their characteristics. The ability to synthesize refers to describing facts or phenomena in a summarized form. Finally, the ability to interpret consists of explaining the facts or phenomena, giving them meaning [20].

Here the epistemological theory is present, which has shaped a philosophical image of the processes and methods of generation, acceptance, and propagation of knowledge, especially of scientific knowledge. This image is different from the image that scientists have of their own activities and their results, as well as from that of the wider society. Epistemology holds that research skills are essential for the advancement of knowledge and understanding in any field. These skills involve the ability to formulate relevant questions, design and conduct empirical research, collect and analyze data, assess the quality and reliability of information, and communicate results clearly and effectively [21].

This study is convenient to deepen and understand the skills developed by students who have studied for a graduate degree, it also has significant contributions as a practical, methodological, social, and theoretical contribution, so it is necessary to address it, although there are a number of studies that talk about research skills in undergraduate level, There is not much information on this subject at the postgraduate level, since they are the ones who are

more immersed in the development of research work, which is why it is necessary to know if they have managed to adequately develop these skills in order to be able to guide them in the realization of scientific productions.

Likewise, this study responds to the general question: What is the level of research skills from the perspective of a graduate student of a Peruvian Public University?

Therefore, the objective of the study is to determine the level of research skills of graduate students.

2. Math

This study is based on the positivist paradigm, framed in the quantitative approach [22], they mention that in this approach data collection is used to be able to prove the hypothesis based on a numerical measurement and also the statistical analysis, it was of a basic type that according to Baena [23]. supported that it is based on investigating a problem, which is only pigeonholed in theoretical support without considering the practice, it also had a cross-sectional cut for Dzul [24]. indicates that it focuses on examining the level of one or more variables at an established time. Finally, it used a non-experimental design, which is based on the observation of variables in their natural state, so that they will later be analyzed [25]. [26]. [27]. being descriptive, achieving a diagnosis of the participants.

According to Hernández et al. [28]. The study sample is made up of cases or elements that are of interest to investigate, in this research 40 (37.5% female and 62.5% male) graduate students enrolled in the Master's Degree in Research and University Teaching participated, which were chosen through non-probabilistic sampling by convenience, for Hernández et al. [29]. indicate that it is a representative fraction of the population where the choice of the units of measurement does not depend on the possibility, but on the aspects of the study, having as exclusion criteria all students who do not have regular attendance and who do not wish to participate in the study; to whom a questionnaire was applied to evaluate research skills.

According to Rodríguez et al. [27]. is a data collection instrument that is made up of a systematized set of questions, which have to be answered; had a total of 40 items that evaluates 4 dimensions: Epistemological (10 items), problematizing (10 items), methodological (10 items) and instrumental (10 items), where the response options were Likert type with five response options ranging from 1 to 5 points, having an approximate time of 20 minutes, elaborated through Google Forms.

In terms of research ethics, the identity of the participants was safeguarded, as well as the informed consent was written on the form, and the physical and mental integrity of the participant was not put at risk at any time.

The reliability criterion was determined through Cronbach's Alpha coefficient, presenting a very high level of reliability ($\alpha = .952$). For validity, it was carried out through a judgment of experts, trained professionals who are immersed in conducting research work.

For the statistical processing, we worked with the Excel program and the Statistical Package for Social Sciences SPSS version 25, achieving descriptive statistics that allowed the elaboration of tables with their respective absolute and relative frequencies.

3. Results

The data obtained through the survey were calculated through descriptive statistics in order to show the behavior of the variables and their dimensions, the results of which are presented below:

Table 1. Research skills of graduate students of the Master's Degree in University Research and Teaching at a Peruvian Public University.

	Frequency	Percent
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Medium	4	10%
High	36	90%
Total	40	100%

\bar{X} : 166,72

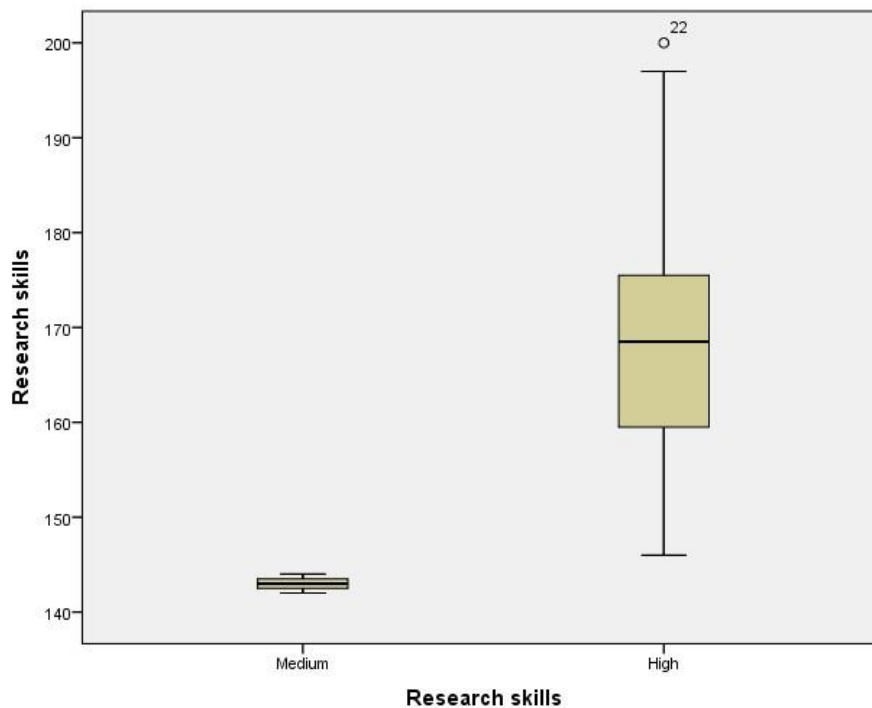


Figure 1. Level of research skills of the graduate students.

According to the table, the level of research skills of graduate students with master's degrees in University Research and Teaching is within the medium and high levels represented by 10% (4/40) and 90% (36/40) respectively; taking into account the value of the arithmetic mean, it can be pointed out that, globally, it is possible to fall into the high level (166.72 points).

Table 2. Epistemological dimension of graduate students' research skills.

	Frequency	Percent
Medium	2	5%
High	38	95%
Total	40	100%

\bar{X} : 44.93

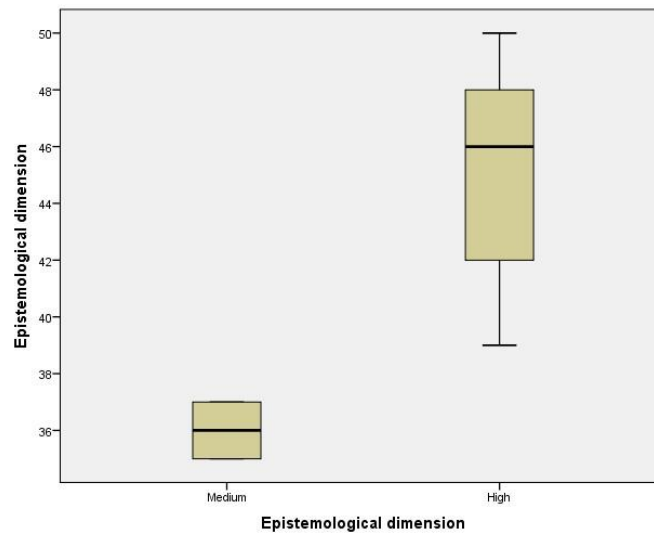


Figure 2. Epistemological dimension of graduate students' research skills.

The table shows that the participants are within the medium and high levels represented by 5% (2/40) and 95% (38/40) respectively; taking into account the value of the arithmetic mean, the participants are globally located within the high level (44.93 points). This shows that graduate students have developed the epistemological dimension of research skills, achieving flexibility of thought, cognitive self-regulation, and management of metacognitive strategies.

Table 3. Problematizing dimension of graduate students' research skills.

	Frequency	Percent
Medium	9	22,5%
High	31	77,5%
Total	40	100%

\bar{X} : 41,43

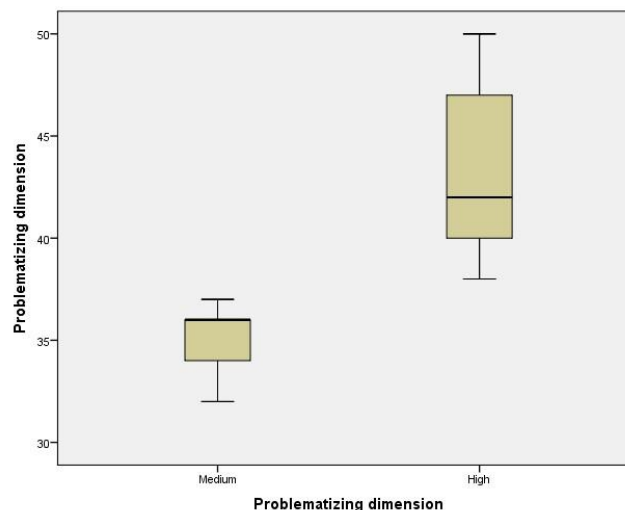


Figure 3. Problematizing dimension of graduate students' research skills.

According to the table, the participants are within the medium and high levels represented by 22.5% and 77.5% respectively; taking into account the value of the arithmetic mean, the participants are globally located within the high level (41.43 points). This shows that most of the graduate students have developed the problematizing dimension of research skills, achieving an adequate observation of reality and are able to pose scientific problems.

Table 4. Methodological dimension of graduate students' research skills.

	Frequency	Percent
Medium	7	17,5%
High	33	82,5%
Total	40	100%

\bar{X} : 41,25

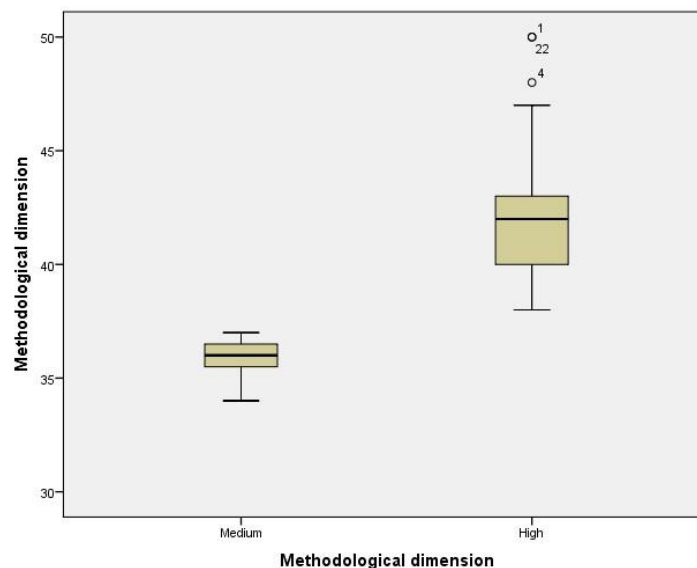


Figure 4. Methodological dimension of graduate students' research skills.

According to the table, the participants are within the medium and high levels represented by 17.5% and 82.5% respectively; taking into account the value of the arithmetic mean, the participants are globally located within the high level (41.25 points). This shows that most of the graduate students have developed the methodological dimension of research skills, achieving an adequate knowledge of the research process, coherence among the elements of the research, and respect for the rules of writing.

Table 5. Instrumental dimension of graduate students' research skills.

	Frequency	Percent
Medium	18	45%
High	22	55%
Total	40	100%

\bar{X} : 39.12

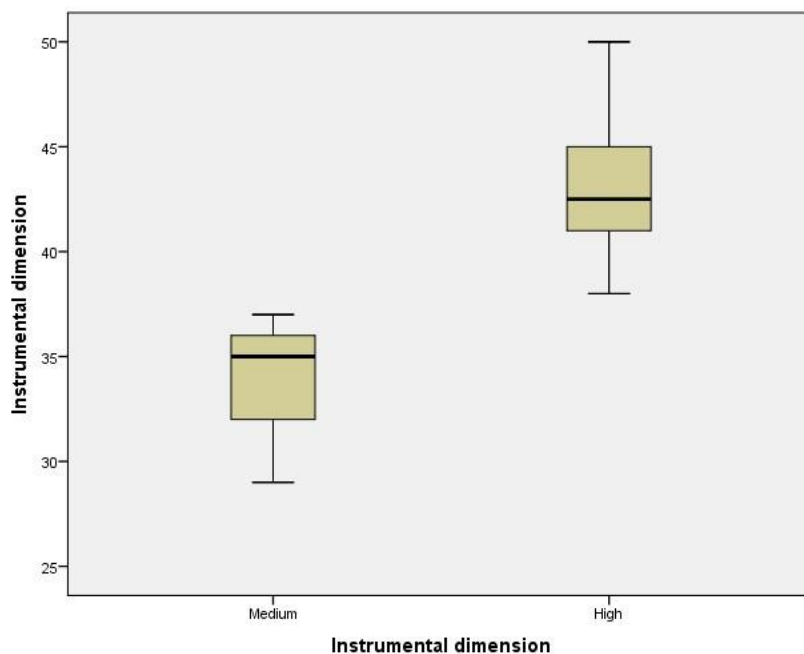


Figure 5. Instrumental dimension of graduate students' research skills.

According to the table, the participants are within the medium and high levels represented by 45% and 55% respectively; taking into account the value of the arithmetic mean, the participants are globally located within the high level (39.12 points). This shows that most of the graduate students have developed the instrumental dimension of research skills, achieving an adequate application of the instruments for data collection, organization and processing of data, management of statistical packages, and interpretation of results.

4. Discussion

Currently, the development of research work is of great importance and usefulness for good professional performance, in addition to contributing to comprehensive training, preparing them to make decisions in environments that are increasingly uncertain and unstable [30]. Thus, education must be aligned with the new approaches to strengthen research skills that allow the development of academic and scientific productions that contribute to the growth and progress of the country [31], [32].

According to the results obtained, it has been shown that graduate students have a high level of development of research skills, which allows them to adequately develop research work or provide solutions to the problems to which they may be exposed. Thus, a comparison can be made with other studies that have also addressed this same variable; thus, there is research conducted by Alfaro, et al. [33], who also obtained similar percentages, showing that the large number of favorable responses indicates that they have a level between medium and high represented in 57.88%.

Research skills in universities are of utmost importance because they promote meaningful learning processes and banish the traditional teaching of research, according to the results of another study it has been found that the organizational, communicational, and collaborative skills of teachers are good according to what was stated by the students of the universities that served as a sample [34], these results are related to other findings [35], which also consider that research skills are good. The research-based teaching for the development of research skills has become the north to follow, the project methodology used by teachers highlights the experiential character, developing the students' positive attitudes to undertake research projects.

The project methodology used by teachers emphasizes the experiential nature, developing positive attitudes in students to undertake processes of inquiry and deepening the structuring of integral knowledge [36], under this same idea they affirm that research skills are a fundamental part of scientific research [37].

On the other hand, there are also studies that differ from the results obtained in this research, mentioning a study conducted in the same country (Peru), on master's degree students in education where there was a strong deficiency in terms of research skills, which interferes in the development of research work in this sample of studies [38]. Along the same lines, the study of Alvarado [39], who found that 58% of the master's degree students were at the medium level, evidencing an inefficient research culture that does not allow scientific production by students, who need to have research experiences to achieve scientific development.

In another investigation it was found that teachers do not have solid scientific competencies, which does not favor the understanding of the person's environment [40]. In a study conducted on students of the graduate school of the Universidad César Vallejo, the results obtained show that, globally, as well as in its dimensions, the research skills of the master's students are located in a higher percentage in the medium and low level [41].

These shortcomings may be due to the fact that they relate research only to the completion of graduate work, which leads to the fact that they do not continue to develop these skills [42]; a deficit in research skills will have a significant impact on scientific production, which is manifested with low ranks in the substantive function of research and its different standards [37].

5. Conclusions

In recent years there has been a greater predisposition on the part of professionals to carry out research work, which has led them to follow various courses and training that contribute to better development of their research skills, as evidenced by the results obtained in this research.

Although globally the master's degree students have achieved a high level in a majority percentage, there are results that tend to attract attention as is the case of the instrumental dimension where they present certain deficiencies, so it is necessary to develop strategies to achieve improvements in this aspect, which finally contribute to these professionals not only to publish scientific articles in high impact journals but also to transmit their knowledge to their students in the universities where they teach.

It is evident that there is some difficulty in processing the information collected, not having adequate handling of statistical packages, which has a direct impact on the production of research papers with scientific rigor; it is necessary to recognize the importance of undergraduate and graduate students to develop these skills in order to achieve more professionals immersed in the development of research papers that allow underdeveloped countries to continue growing, transforming the environment in which they develop.

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