Decisions on Methodological Paths in Final Graduation Projects: Sharing Steps by Step

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Abstract:

Objective: To investigate the perceptions of students in the Bachelor's Degree programs in Speech-Language Pathology and Nutrition regarding the level of difficulty they identify according to the type of research selected at a private university from January to March 2026.

Materials and methods: This was a descriptive, non-experimental study. It consisted of two stages: the preparation of possible methodological approaches for Final Graduation Projects, and the second stage, a survey of 16 students from two programs within the Faculty of Medical Sciences who had completed or were about to complete their Final Graduation Projects, between January and March 2026. The survey focused on aspects that presented difficulties in their approach, according to the type of research selected.

Results: The activities to be developed were defined according to the chosen type of research. Four methodological approaches were designed: literature review, survey research, interview research, and case study. Regarding the results obtained from the survey of advanced students, active and supplementary variables were considered in the Principal Component Analysis. The explained variance reaches almost 80%, which is considered a good fit.

Conclusions: The Methodology department is working intensively on designing activities that strengthen the skills necessary for students to continue along the path they must follow to complete their Final Graduation Project.

Keywords: Research Methodology, Principal Component Analysis, Types of Research, Higher Education, Methodological Approaches.

Introduction

Science is the result of a socio-historical activity. Therefore, its main characteristics have been defined throughout history, thus differentiating it from other modes of knowledge possible for humankind. Among its distinctive features is the implementation of a method in the research process; and from this, fundamentally, derives its rigorous nature. Scientific research involves an ordered set of procedures that lead from the formulation of a problem to its possible solutions. The method, with rigor, orders, facilitates, and evaluates the steps that lead to a well-founded assertion. However, the effectiveness of implementing a method requires criteria that transcend its own scope and link methodology with epistemology. The subject of Research Methodology is structured around a thematic axis: the sequence of the scientific research process. Therefore, the key is not to impart recipes or prescriptions in the discussion of the knowledge available in the research process. Following Samaja's (1999) perspective, Tamayo and Tamayo (2004) associate three elements that are established in "every scientific relationship": Reality, Research, and Science, so intimately linked that it is impossible to imagine one without the other. As they emphasize, Research is the way in which Science "achieves scientific knowledge." Hernández Sampieri et al. (2010) state that research permeates all fields and disciplines; therefore, students would be at a disadvantage in this globalized world if they are not trained in it. Sánchez Cegarra (2004) has linked creativity, research, the evaluation of research efficiency, production, and advances in scientific knowledge in his work. Research in this field is relatively new in teacher training, despite its known incredible potential. Advances have allowed for the implementation of a variety of remote instruments, such as online surveys, as noted by Rocco and Oliari (2007). and recognize the advantages and disadvantages of its implementation. Guirao Goris and Silamani (2015) propose in their work that the literature review in recent years has generated variability in types of reviews. The literature review is a fundamental stage to guide the research. The relevance of databases of publications of interest is recognized (Calle, 2016). Henry (2016) points out that the use of this type of instrument favors the visibility of data on certain identified problems. González-Veja et al. (2022) make an interesting distinction between types of interviews and the importance of the interpretation of the data obtained. The objective of this research was: To investigate the perception of students of the Bachelor's Degree in Speech Therapy and Bachelor's Degree in Nutrition regarding the degree of difficulty they identify according to the type of research selected at a private university from January to March 2026.

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Materials and Methods

The research is conducted in a descriptive, non-experimental manner. It is designed in two stages. First, the steps to follow regarding the selected research approach are outlined, presenting four possibilities among several that exist. Second, 16 students who have completed or are close to completing their Final Graduation Project, between January and March 2026, are surveyed about aspects that pose difficulties in their approach according to the type of research selected.

Results

In the first stage, the sequence of activities to be carried out according to the desired type of research is developed.

Table 1: *Guide for conducting research that addresses a Literature Review*

1. Identify the research topic of interest.	2. Develop an algorithm to identify at least 10 articles published within the last 5 years. Identify inclusion and exclusion criteria. Write an introduction that includes the Problem Statement and Objectives.	3. Prepare a State of the Art review, using at least 20 sources. This must include a section on materials and methods. Create a table indicating, for each unit of analysis, the title, authors, year of publication, and a link.
4. Create three more tables. The first will address the variables associated with the discipline, the second the methodological aspects, and the third the bibliographic aspects.	5- In a table of at least four columns, analyze the variables specific to the discipline. The variables from both the general and specific objectives should be included. Look for patterns in the different articles, indicating them with different colors. The results for each column are displayed in a word cloud, and the results obtained are then analyzed.	
6- In the table of methodological variables, create as many columns as there are aspects to consider, such as General Objective, Scope of the Research, Design, Variables, Sample, Instruments, and Keywords. Look for patterns, identify them with colors, and display the results in word clouds, which are then analyzed.		
7- In the table of bibliographic variables, include at least the following: number of sources consulted, type of sources, year of publication, location where the research was conducted, and country of publication. The data are visualized using different types of graphs.		

Note: Prepared by the author (2026)

Table 2: *Guide for Conducting Research Using an Interview/Survey*

1- Identify the research topic of interest.	2- Develop an algorithm to identify at least 10 articles published within the last 5 years. Identify inclusion and exclusion criteria. Formulate the Problem and Objectives.	3- Develop a State of the Art review, using at least 20 sources. Prepare the materials and methods section, considering: Scope of the Research, Design, Population, Unit of Analysis, and Sample. List the variables to be studied. Indicate the instrument, in this case, a survey.
4- Request the letter template from the methodological advisor to notify the institution(s) where the study will be conducted, explaining its purpose and requesting authorization to contact the academic units.	5- The Faculty Secretariat sends the letter template by email to the contact person at the host institution. Meanwhile, obtain informed consent. In the case of studying minors, the signature and printed name of both parents are required.	
6- The survey is designed and can be implemented face-to-face or online. It should include a variety of questions, such as dichotomous, multiple-choice, checkbox, semantic, and grid questions.		
7- If the survey was conducted face-to-face, the responses must be entered manually. If it was conducted online, the data matrix is downloaded directly. The information is then used to create graphs that visualize the data.		

Note: Prepared by the author (2026)

Table 3: *Guide for Conducting Research Using a Semi-Structured Interview*

1- Identify the research topic of interest.	2- Develop an algorithm to identify at least 10 articles published within the last 5 years. Identify inclusion and exclusion criteria. Develop an introduction that includes the Problem and Objectives.	3. Develop a State of the Art review, using at least 20 sources. Prepare materials and methods, considering: Scope of the Research, Design, Population, Unit of Analysis, and Sample. List the variables that will be studied. Indicate the instrument, in this case, an interview.
4- Request the letter template from the methodological advisor to notify the institution(s) where the study will be conducted, explaining its purpose and requesting authorization to contact the Unit of Analysis.	5- The Faculty Secretariat sends the letter via email to the contact person at the host institution. Meanwhile, obtain informed consent. In the case of studying minors, the signature and printed name of both parents are required.	
6- The interview is designed and can be conducted face-to-face or online. Recordings and videos can also be made, as it is valuable to document the information provided by the interviewee verbally and through nonverbal communication. A variety of open-ended questions should be included to encourage the development of broad and complete responses, such as: What do you do with…? How do you perceive…? What do you think…? What does… mean? What is your opinion about…?		
7- The responses are transcribed verbatim and coded to identify patterns. Word clouds are then created from the data to reflect the frequency of emerging variables		

Note: Author's own work (2026)

**Table 4:** *Guide for Conducting a Case Study Research Project*

1- Identify the research topic of interest.	2. Develop an algorithm to identify at least 10 articles published within the last 5 years. Identify inclusion and exclusion criteria. Write an introduction that includes the Problem and Objectives of the case study.	3. Develop a State of the Art review, using at least 20 sources. Develop a Materials and Methods section, considering: Scope of the Research, Design, and Unit of Analysis (not necessarily only one).
4- Request the letter template from the methodological advisor to notify the institution(s) where the case observation and follow-up will take place, stating the purpose of the research and requesting authorization to contact the UA.	5- The Faculty secretary sends the letter template by email to the responsible party at the destination institution. Meanwhile, informed consent is obtained. If minors are involved in the study, the signature and printed name of both parents are required.	
6- Observations are conducted by recording or filming, after prior notification of the recording techniques to be implemented in the informed consent form. Eight to ten sessions are recorded. The data obtained are compiled into tables with at least four columns. The first column reflects the purpose of each stage of the session, the second the professional's interventions (representing the text in italics), the third the participation of the clinical assistant, and the fourth the strategies/resources. The researcher may also record nonverbal communication.		
7- The data are then coded, recognizing regularities and identifying emerging variables. Word clouds are created from the information to reflect the frequency with which these variables occur. The data obtained can be triangulated with previous clinical records, studies conducted, or interviews with professionals.		

Note: Author's own elaboration (2026)

The survey results are presented below.

Table 5: *Average score obtained for the variables*

Research Problem Formulation	3,25
Formulation of Objectives	3,69
Writing the Introduction	3,06
Preparation of the State of the Art	2,88
Selection of Materials and Methods	3,44
Instrument Design	3,38
Data Collection	2,94
Data Analysis	3,13
Writing of Conclusions	3,19

Note: A 5-point scale was used, where 1 meant extremely difficult and 5 meant not difficult at all.

A Principal Component Analysis was performed, considering the following as active variables: Research Problem Formulation, Formulation of Objectives, Writing the Introduction, Preparation of the State of the Art, Selection of Materials and Methods, Instrument Design, Data Collection, Data Analysis, and Writing of Conclusions. The variables Major and Data Collection Instrument were considered as supplementary variables. The variance explained by three factors reaches almost 80%, which is considered a good fit. Although two factors, accounting for 64.84% of the variability, are used for the PCA visualization,

Table 6: *Explained variance of the principal components*

	F1	**F2**	**F3**	F4	F5	F6	F7	F8	F9
Eigenvalue	**4,229**	**1,607**	**1,304**	0,769	0,407	0,347	0,210	0,103	0,025
Variability (%)	**46,984**	**17,856**	**14,488**	8,540	4,522	3,852	2,335	1,148	0,275
Cumulative %	**46,984**	**64,840**	**79,329**	87,869	92,391	96,242	98,578	99,725	100,000

Figure 1: *Observations on the factorial plane*

In the first quadrant, the variables linked to the first stage of the research process can be observed. The observations reflected there, and those furthest from the center of the factors, are those for whom developing the topics linked to these variables was easiest (e.g., Observation 1). Observations such as 11 and 13, which are closer to the center of the graph, identify their relationship with these variables as neither very easy nor very difficult. In the fourth quadrant, those related to fieldwork and data analysis are identified. In this quadrant, the observations found, in accordance with the average scores obtained, consider these variables as neither very easy nor very difficult. In the second and third quadrants are located those observations for whom carrying out the active variables used in this analysis was most difficult. Regarding the academic programs and the data collection instruments, no differences were observed.

Figure 2: *Observations on the factorial plane according to research type*
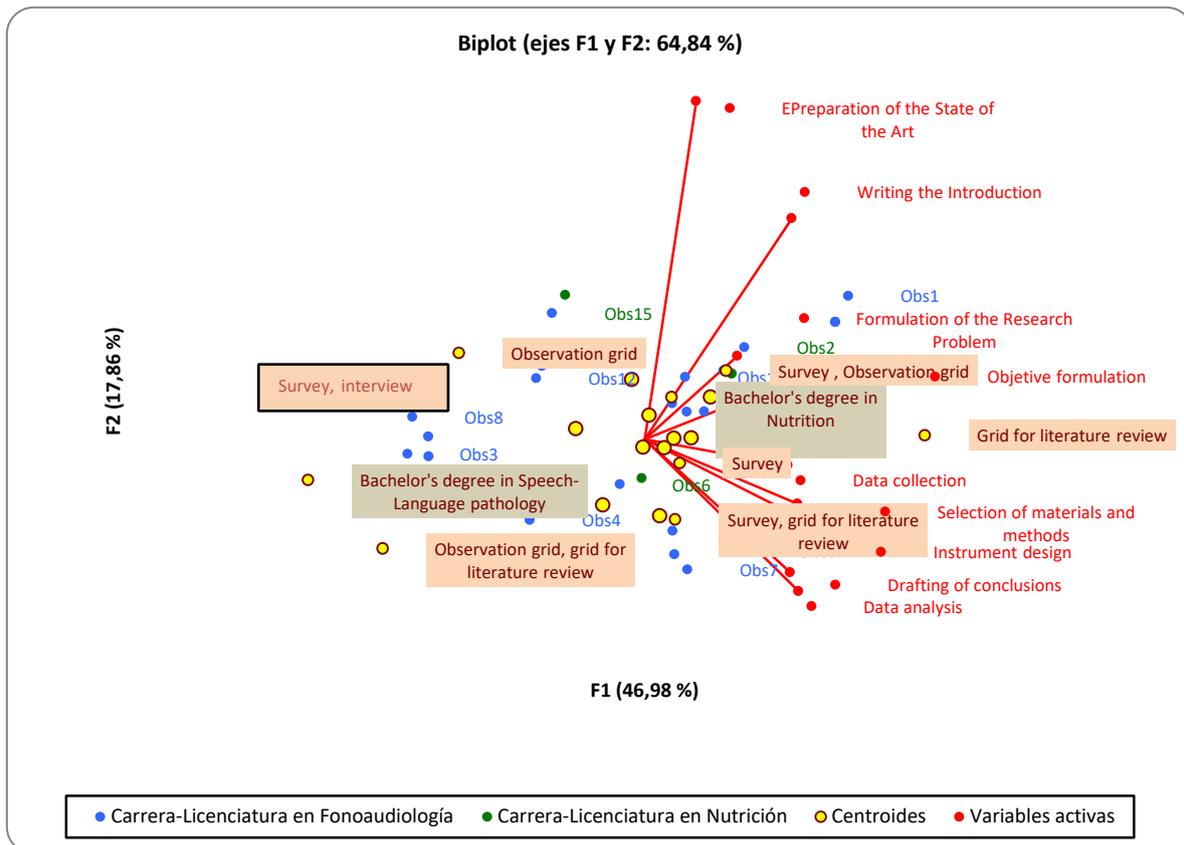
Conclusions

The Methodology department works intensively on designing activities that promote the strengthening of skills that allow students to continue along the path they must follow to develop their Final Graduation Project.

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