10-3-2023

Undergraduate and Graduate Students’ Challenges: A Qualitative Study with ONDAS Framework Across Multiple Disciplines and Innovative Research Methodologies

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Abstract
The integration levels among research methods, management, research tools, and psychology could guide the development of the ONDAS framework toward the secrets of knowledge. The research grounds on undergraduate and graduate students’ challenges, with particular emphasis on the need for writing critical literature reviews and weaknesses in identifying benchmark studies to extract the research gap and main research questions, resulting in most fresh graduate students not graduating on time. Some master’s students write doctoral theses, and vice versa, confusing their identified research approach. The study utilizes desk documents to identify the main problems that most students experienced during their research, to determine the knowledge structure through the analysis of benchmark studies, and to achieve the framework’s development foundation. As a result, it proposes ONDAS framework characteristics, procedures, and rules to be applied in different fields through data triangulation. Aiming to help the research process, ONDAS focused the study from its very beginning until viva voice discussion; this framework decreases the time of writing and preparation, guiding the research and strategy processes, and promoting tools to help with the analysis and elaboration of final theses. Results were achieved by a qualitative approach using the case study method that includes 40 participants in a semi-structured questionnaire on their experiences with ONDAS framework. Most participants showed higher control and motivation, finishing on time and conducting their research with high precision and focus, establishing the integration of four primary levels that aid in developing the ONDAS framework across multiple disciplines and innovative research methodologies. Specifically, it is helpful for the scientific research community in academic-industry liaisons. This study is seen as the first of its kind to assess participants’ attitudes, especially their research journey that serves as the primary way of adoption.

Keywords
ONDAS framework, innovative research framework, research design, research methodology, reserchology, knowledge structure, postgraduate students, doctoral theses, master dissertations, undergraduate students

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Acknowledgements

The authors acknowledge the contribution of students in the FIC “Fundamentos de Investigação Científica/Research Methodology for Postgraduate studies” from semester I (2021/2022) until semester I (2022/2023) course at Instituto Politécnico de Beja. The authors would also like to extend their gratitude to the respondents who filled out questionnaires from online workshops held in (LA- the United States, Beja-Portugal, KL-Malaysia, Larnaca- Cyprus, and Erbil- Iraq).

This article is available in The Qualitative Report: https://nsuworks.nova.edu/tqr/vol28/iss10/5
Undergraduate and Graduate Students’ Challenges: A Qualitative Study with ONDAS Framework Across Multiple Disciplines and Innovative Research Methodologies

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Keywords: ONDAS framework, innovative research framework, research design, research methodology, researchology, knowledge structure, postgraduate students, doctoral theses, master dissertations, undergraduate students

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Introduction

Universities have a critical role in producing the educated and skilled workforce of the future. There is great significance in the recent proliferation of undergraduate and postgraduate programs offered by academic institutions. The terms, “bachelor’s degree,” “master's degree,” and “doctoral degree” in the field of natural sciences, engineering and technology, medical and health sciences, agriculture sciences, social sciences, and humanities studies all refer to under/postgraduate education.

According to (Karakütük, 1999), the main objectives of undergraduate and graduate education are to produce a skilled workforce that can solve national problems and is needed by public and private sectors to crop qualified scientists, researchers, and academic members, who are conducting scientific research that can contribute to the development of a nation. A similar line of thinking can be seen in (Varış, 1984), which considers graduate education as a means through which scientists may ensure the development of technology crucial to a nation's growth. Additionally, there must be a larger pool of accessible workers to back up the technical development and new product invention. As analyzed by (Güney and Güney, 2011) regarding future projections for higher education, it is suggested that demand for undergraduate and graduate studies, scholars, and researchers will expand as public and private institutions flourish.

A few scenarios were approached about the difficulties of under/postgraduate studies presented in the relevant literature, despite the widespread agreement that a more significant number of people with graduate degrees is essential to increase the number of highly skilled workers. For instance, (Ağrarioğlu, 2013) claims that under/postgraduate education suffers from a lack of qualified instructors and thesis advisors, course materials are not updated to reflect the latest scientific findings, and under/postgraduate education departments are opened at will, regardless of the qualifications of their faculty or the quality of their research. Similarly, (Buluç, 2012) states that several factors, including an excessive number of course and thesis students per academic member, negatively impact the quality of postgraduate education. Also, (Çakmak, 2012) and (Bülbül, 2011) have highlighted three main points: a lack of interaction between academic members and students, funding for graduate students, and resources for teachers and school administrators who want to pursue postgraduate education. (Ibiş, 2014), who examines the issue of fundamental problems in graduate education from a macro perspective, posits that insufficient funds were allocated to graduate education as a percentage of national income, insufficient ties were not forged between graduate education and industry, and insufficient internationalization was not ensured in graduate education.

In this context, an international literature survey reveals that identical issues were debated at the graduate level in many countries. For instance, insufficient funding and a lack of enthusiasm are examples of “academic” concerns. At the same time, “institutional” issues are defined as “problems in the institution's substructure,” and “personal” issues are understood to be “problems with the student,” as described by (Duan and Shan, 2013). (Sezgin, 2002) states that increasing a country's skilled workforce's research and development capacity and the number of academics and specialists available to the public and private sectors are all aims of graduate-level education programs, the success of which must be exposed.

A deeper approach to various research projects from different fields, including natural sciences, engineering and technology, medical and health sciences, agriculture sciences, social sciences, and humanities demands hard work and focus where a proper plan during all execution phases and especially during the initial design is a must. A lousy design approach may cause research problems, guide the study in less-than-ideal ways, and need a new project formulation, wasting time and delaying the project's completion. Moreover, the influence of
supervisors plays a vital role in selecting thesis topics and committees throughout the research journey.

Focusing more on a good and solid research technique is vital in conducting a thorough and robust study with defined aims that may be significant to exist knowledge. Students and researchers constructing projects and theses often need help deciding their technique type and how it should be used, explained, and verified. Supervisors often ask for modifications and updates on their students' techniques, which is often a critical topic during viva voice exams. A proper justification of the chosen research technique and its data collecting, analysis, and validation aspects gives greater control over the research process. It boosts students' belief in their study, resulting in superior discussion and viva voice outcomes. Today, most undergraduate and postgraduate programs do not offer research methodology courses. When they do, a purely theoretical and complex approach is adopted, not focusing on the necessary linkage between theory and practice, leaving students lost and dependent on their supervisors' views and suggestions throughout the development and validation of their work.

Adding common research challenges to the last issue, where students need to regulate their inquiry adequately, drives a huge percentage of them to stop their theses, even though they had previously completed all courses, without getting the academic grade they were applying for. Those that conclude their research and theses often do so late, spending months or years investigating to explain their research topic and directing the study in a decentralized and inefficient way.

Many postgraduate students struggle to write a comprehensive, highly synthesized, and critically analyzed literature review (LR). Without a proper understanding, many students only manage to write shallow LR and fail to curate novel contributions to the body of knowledge. Failure to write comprehensive LR eventually leads to weak development of the theoretical framework. Similarly, most postgraduate studies need more critical analysis, which makes their papers rejected by high-impact indexed journals. Moreover, they could not identify a research gap through benchmark works nor identify the scope and limitations of their research. Furthermore, it is hard to obtain a clear problem statement, main research question, and research objectives within two years for master's studies and three years for doctoral ones. Consequently, some master's students write theses at the doctoral level, and vice versa; some doctoral candidates write two master theses, which might cause them to get confused about their research goals.

According to the knowledge structure (Figure 12), ONDAS framework was developed by Dr. Omar Khasro Akram and Dr. Daniel José Franco to make undergraduate and postgraduate students as well as professional researchers able to finish their research within the scheduled time (Akram et al., 2018a; Akram et al., 2019a). In the third decade of the 21st century, this method helped scientific researchers and scholars to manage their work with a good quality of knowledge and address the issues faced during their research. Most undergraduate and postgraduate candidates have faced several difficulties in guiding their thesis and dissertations, sometimes spending years searching for a justification for their research problem and conducting their research in a decentralized and inefficient form. This process often results in dropouts and failure. According to the main presented scenarios and research problems, this study established a main research question (main RQ) and three research objectives (ROs) aiming to address the described issues:
Main RQ: How to develop a scientific research framework to help undergraduate and postgraduate students through a knowledge structure?

- RO1: To describe the problems that most under/graduate students experience during their studies;
- RO2: To determine the knowledge structure through the analysis of benchmark studies; to have the foundation for the framework development;
- RO3: To propose ONDAS framework characteristics, procedures, and rules to be applied and used across multiple disciplines.

**Method**

This research used different studies as a case study, aiming to develop an ONDAS framework for research progression, where it was necessary to establish different data sources levels, such as case reference analysis, desk documents, and semi-structured questionnaires with undergraduate students, postgraduate students, professional researchers, and the supervisory committee. The aim of performing an analysis through a root diagram was to obtain themes suitable to prepare questions for the semi-structured questionnaires and help to address the problem statement by knowledge structure.

This study used a qualitative approach directly connected to the case study, focusing on the strategy for testing deterministic propositions case by case (Zainal, 2007). Qualitative research is suitable for clarifying and identifying social experiences in natural or real life. This method tried to find answers to questions like why, how, who, and what, rather than trying to learn how many or how much, which are generally used for statistical purposes (Akram, 2020; Akram et al., 2019b, 2018b).

In this study, the methodology adopted three main sources: case reference analysis and desk documentation as secondary data and online semi-structured questionnaires as primary data.

Deeper into the main data sources they are taken through different approaches, like the literature review that covered a wide range of the existing body of knowledge, focusing also on recent academic and professional works in the area. This type of tactic ensured a background for the following research steps, as identified before, in the knowledge structure and helped achieve the foundation for the ONDAS framework development. Also, desk documents, namely archival analysis and similar case references, involved the study of existing research methods and tools, either to understand their actual content or to clarify deeper meanings, which was revealed by their style and coverage. Furthermore, the semi-structured questionnaire was held to help compile important information for the framework development.

Choosing a pilot test for this research made it possible, before applying it to the participants, to conceptually optimize the type of questions and to identify their main variables in terms of clarity, presentation, strategy, and comprehensiveness, aiming to reduce the errors that possibly make the main study a waste of effort, time, and money (Figure 1). In the specific study of this research, the questionnaire was verified by three professors from the field of education, management, and psychology, determining both approaches: firstly, if there were flaws, limitations, or other weaknesses within the questionnaire schedule so that there would be time for the researchers to make the necessary revisions before the implementation of the actual interview; secondly, to check technical jargons and terminologies that were possibly misleading the question’s guides and their strategy.
As primary data, a semi-structured questionnaire was chosen not just by its flexibility but also because it allowed deepening ideas and options (Rubin & Rubin, 2005; Walliman, 2018). The semi-structured online questionnaire was conducted from August 15th, 2022 to August 25th, 2022. A total of 40 participants were involved, consisting of six different disciplines like natural sciences (mathematics, physical science, chemical sciences, earth and related environmental sciences, and biological science); engineering and technology (architecture engineering, civil engineering, electrical engineering, electronic engineering, information engineering, mechanical engineering, chemical engineering, materials engineering, medical engineering, environmental engineering, environmental biotechnology, industrial biotechnology, nano-technology, food engineering); medical and health sciences (basic medicine, clinical medicine, health sciences, medical biotechnology, forensic science); agriculture sciences (agriculture, forestry, and fisheries; animal and dairy science; veterinary science; agricultural biotechnology); social sciences (psychology, economies and business, educational sciences, sociology, law, political science, social and economic geography, media and communications); humanities (history and archaeology, languages and literature, philosophy, ethics and religion, and arts). The questionnaire was conducted among undergraduate and graduate students (both at master's and doctoral levels), professional researchers who were preparing their research proposals for postdocs, and supervisory committees in the years 2018-2022 to determine the effectiveness of using the ONDAS framework as a tool and guide, while developing their research proposals. Participants were exposed to the framework through official coursework at the university or special workshops for preparing research proposals. Therefore, for this study, participants were selected through random sampling to get qualified candidates that would be able to deliver the most credible information. Participants’ selection or sample size was also determined by the objectives and the scope of the study to give authenticity to the results while maximizing the depth and richness of data to address the research problem (Baškarada, 2014; Kuzel, 1999). Furthermore, the number of participants also followed the model (Akram, 2017).
This study used the qualitative analysis software, “NVivo,” created specifically to assist researchers in their analysis process (Figures 2, 8, & 9). This software helped reduce a significant number of manual tasks and gave more time to discover tendencies, recognize themes and patterns, and derive conclusions (Al-Yahmady & Al-Abri, 2013; Brandão, 2013).

Figure 2
NVivo – Word frequency cloud

Descriptive literature is considered an excellent point to start a qualitative study; it was the first used method of analysis, and it was adapted to describe the knowledge structure focused on four themes, including research methods, research tools, management, and psychology. This method aimed to analyze the existing body of knowledge profoundly. It gave a large image, not just about the ONDAS framework, but also about the scenarios of students’ problems, helping to understand the values of linking theoretical approaches to practical fields. Content analysis was the second used method and, this time, for primary data analysis, focused on categorizing textual data into clusters of similar entities and developing the framework’s foundation. For instance, a semi-structured questionnaire was conducted to achieve results, providing more specific information properly. This questionnaire (Figure 3) added new information from the participants’ views and opinions and a numerical scale for evaluation based on the Likert Scale, where the most common scale was from one to five. According to Rob Balon, the Likert Scale should always be used, defining five as positive, one as negative, and never the opposite. Therefore, the questionnaire provided five initial levels, from “Strongly Disagree” to “Strongly Agree,” where it also included a level of “0” for the option of no response (Birkett, 2016). Focusing on a numerical approach, a numerical scale was used to provide a better perception of the evaluation of each question, where collected answers were exported from the database and imported to a Microsoft Excel file, and a simple analysis was performed, counting the total number of “No Response,” “Strongly Disagree,” “Disagree,” “Quite Agree,” “Agree,” and “Strongly Agree” answers for each question.
The validation was performed by data triangulation, which in this case involved three different data sources (case reference analysis, archival analysis, and a semi-structured questionnaire) to increase the validity of the study. This type of triangulation was adopted for this study not just because it is identified as the most popular and most accessible type but also because it fits the nature of the research and correctly addresses its needs (Figure 4; Akram, 2020; Akram, 2017; Guion et al., 2011; Rowley, 2002).
Figure 4
Research process adopted from ONDAS framework
Results

Case Reference Analysis and Desk Documents – The Proposed ONDAS Framework

From Figure 5, it was possible to find that scientists in the “color psychology” discipline study the varying emotional and cognitive responses people have to various hues. In the latter part of the 17th century, Newton uncovered the color spectrum and investigated how various wavelengths of light determine distinct colors. The color wheel was created by Isaac Newton in 1704, and Carl Jung, a Swiss psychiatrist, investigated the psychological impact of color in the early 20th century. Then, through time, it evolved into a shade primarily used in commercial settings. In ONDAS framework, the methodology was also based on color psychology to investigate ideas like color perception and how the effects on human thinking occur during the research journey, mainly when researchers tried to investigate the problem statement and identify their research guides to establish a new theoretical literature focus. In this view, before writing a study proposal, it was crucial to thoroughly describe the ONDAS framework, which involved many steps before arriving at the end destination. At this point, we will be concentrating on Stage 1, which details the researcher’s background, the research problem, and the benchmark that this study strived to discover:

Figure 5
Identification of the main color for the foundation of the problem statement

Initial Problem Statement = Research Problem + Research Gap + Purpose of Study

The choice of main colors as the basis for ONDAS framework’s first stage allowed the identification of a more profound meaning associated with each color. For instance, a red highlight indicated a research problem gleaned from the benchmark study. In contrast, blue indicated an urgent need for a solution that necessitates the researcher’s intrinsic motivation to maintain any semblance of authority over the task that was being done. However, highlighted
in yellow, a research purpose included a description of the effects, both at national and worldwide scopes. Whether the concrete outcomes have the potential for a larger market, they were also helpful to prospective investors.

Highlighting Stage 2 required a justification of the gap and confirmation of the problem statement shown by the chosen benchmark, both discovered in Stage 1 of the research process. At this point, new outcomes were validated by comparing them to prior work and the study, thereby adding to the already existing body of knowledge.

In Stage 3, the problem statement was verified to correctly identify the construct elements, including the base of research, body of knowledge, research core, main RQ, title of the research, covered topics, sources, and chapter locations. Stage 4 indicated that the study was continuing to use research guides as its foundation while working to define the research objectives, sub-RQs, expected results, and the new contribution to the existing body of knowledge.

The following stage is Stage 5A, where it was used the Matryoshka Model, also included in ONDAS framework, to sift through articles, theses, archives, and books, among others. Here, many secondary materials were used to find relevant sources to the suggested subject on which the new LR could be based. Conversely, Stage 5B evaluated the originality of the authoring of the new LR. Moreover, it utilized a “Mind Plan,” compiling relevant works from prior investigations, with tables and descriptions incorporating strengths, weaknesses, and comparisons to this research. In Stage 5C, a root diagram was built to prove the knowledge structure and confirm studies based on related works and selected benchmarks in Stage 2. This root diagram presented the main concepts of every related work under each construct element, composing the first step in developing an initial theory. Stage 5D took advantage of a "Ladder Diagram" to build a new theory for the developed literature review based on what had been detailed in the root diagram (for doctoral studies). In contrast, master’s level studies did so via covered topics. From Stage 5E, a literature map, complete with labels and connecting lines, was used to illustrate the relationship between different areas of coverage and the leading scholars approaching such topics.

In Stage 6, just like in Stage 5D, it was time to link theory to practice to determine the best approach, strategy, method, data, validation method, and variables of analysis. Here it was maintained Stage 4 feedback procedures throughout this stage. On the other hand, Stage 7 required compiling the latest main findings from primary data sources and explaining the methodology and strategies used to verify those results. In Stage 8, it was offered a knowledge claim that substantiates the new contribution to the existing body of knowledge. It is important to note that a knowledge claim must account for the four pillars of philosophy: epistemology, methodology, ontology, and axiology.

Also, it provided an abstract of the project, scoping, this time, into Stage 9. ONDAS framework’s abstract included the theory, study background, problem statement, research objectives, sources of data, followed by methods, expected outcomes, contribution for the existing knowledge, and purpose and benefit of the study. At this point, abstractions came in many forms, depending on the complexity and area of expertise involved in the project. In Stage 10, a flowchart and Gantt Chart were presented detailing the duration and timing of the investigation.

ONDAS framework had several terms, rules, and definitions that are important to highlight; the research guide served as a blueprint for prior investigations, outlining how it was planned to assemble a new literature review to guide his/her work towards a verifiable outcome. There were three different types of research guides: base of research, body of knowledge, and research core. Focusing on the base of research was the first part of the research guide, considered the main foundation of the research, and used or was influenced by the study itself. Typically, it was included in the introductory chapter of the research dissertation and the study’s
background, with a deeper analysis in the LR section (usually chapter two). In Figure 5, purple indicates the search for a base of research. It is worth mentioning that the base of research was achieved when the research problem and gap of research were combined; the body of knowledge was the second part of the research guide and was required to justify and discover the research problem. Studying existing works at their state of the art allows for identifying the gaps and the direction the study needs to follow to address the initial problem and generate the hypothesis/proposition theory. In the social sciences and other areas where a doctorate is often pursued, there was the possibility of two distinct bodies of knowledge depending on whether the research takes a more theoretical or empirical tack. To emphasize the search for relevant studies that aim to identify similar problems and possible solutions, the body of knowledge was represented in orange color (Figure 5). It is important to note that the body of knowledge was completed when the research problem and purpose of study were determined and incorporated into one another; research core was the third part of the research guide and considered a contribution of the research in a unique form. Usually, it worked as an action of research, influencing the base of research and the body of knowledge of the study. This part was usually located in chapters four and five, along with the results and analysis. In doctoral programs, particularly in the scientific, technological, engineering, and design fields, having two distinct research cores was feasible, leading to a more applied approach to developing new processes. A fifth or sixth chapter was included here, depending on the thesis's format and the institution's guidelines. Figure 5 features a research core in green. It is important to note that when the gap of research and the purpose of study were merged, the resulting research core was attained. Moreover, it is also important to mention that base of Research, body of knowledge, and research core were called “construct elements,” being a brief explanation of the keyword that served as a foundation for further studies. There were four different types of research design in ONDAS framework, where it was possible to highlight the connection between the research guide and the construct elements:

- **For Bachelor Level:**

  \[
  \text{Research Guide (RGD) } = \frac{\text{Body of Knowledge (BOK)}}{\text{Base of Research (BOR)}}
  \]

- **For Master Level:**

  \[
  \text{Research Guide (RGD) } = \frac{\text{Body of Knowledge (BOK)}}{\text{Base of Research (BOR)}} + \frac{\text{Research Core (RC)}}{\text{Base of Research (BOR)}}
  \]

- **For Doctoral Level:**

  \[
  \text{Research Guide (RGD) } = \frac{(BOK1)}{(BOR)} + \frac{(BOK2)}{(BOR)} + \frac{(RC1)}{(BOR)} + \frac{(RC2)}{(BOR)}
  \]

  \[
  \text{Research Guide (RGD) } = \frac{(BOK)}{(BOR)} + \frac{(RC1)}{(BOR)} + \frac{(RC2)}{(BOR)}
  \]
ONDAS scholars have developed and refined a research path called “Researchology” designed to help students and researchers navigate the research process. These presented formulas guide how to identify the level of study and inquiry strategy and organize information, main research question (Main-RQ), Sub-RQs, and ROs. By using researchology, students and researchers can better understand the research process and make informed decisions about their work.

Covered topics were used to describe the main key topics related to the correspondent construct element, whereas research sources helped identify the inquiry strategy for the research. The research source was the type of source used to obtain information about each construct element and its corresponding covered topics, while expected results relates to the prediction of outcomes based on the research sources, research objectives, and sub-research questions. Highlighting chapter location focused on the information about the thesis chapter, where the constructed element was deeply studied and described.

From the analysis of the literature review, it was proposed the use of “The Matryoshka Model” to conduct a systematic literature review (SLR), consisting of 15 phases, where it is possible to briefly identify them under seven different actions (Design, Identify, Select, Appraise, Synthesize, Categorize, and Verify) to control on the way of analysis of SLR.

Centering on "Construct Summary" was the summary of each construct element and covered topics based on the information obtained through the different used research sources. After being applied to ONDAS framework’s ladder diagram (Figure 6), this summary used a dominant or merging process to lead the way toward the theoretical hypothesis/proposition (Akram, 2020; Franco, 2021). The ladder diagram starts from the bottom to the top, giving the sensation of climbing stairs to achieve the final hypothesis or proposition. In the literature review field, it was aimed to fill the leading scholars for each construct element, while the first stair used the summaries also for each construct elements of the study. The "stair 2" was achieved by merging the previous summaries, focusing on the main ideas, and avoiding duplicates. Keeping the same maximum number of words (40 & 50 for each summary) was essential, so only the main vital ideas were kept. In the left field, it was aimed to merge the first and second summaries. The center field received the merge from the second and third summaries, while the right field received the merge of the first and third summaries. In "stair 3," to avoid duplication and achieve a particular hypothesis, a dominance selection was performed instead of the merging process, where the researcher selected the dominant summary from the previous step. This stage obtained two different summaries.

"Stair 4" was obtained through a merging process, combining the main ideas of the previous dominant summaries in "Stair 3." After deeper filtration, these main ideas were used as theoretical research hypotheses or propositions (Stair 5). Based on human science psychology on breathing and technical writing, it was stated that the theory statement called "theoretical proposition" required 20 words for the research challenge and 20 words for research motivation, totaling 40 words. Also, referring to verse 255 of the second chapter of the Quran, Al-Baqarah, known as the Throne verse (Arabic: آية الكرسي, Ayat Al-Kursi[a]) (Q2:255), “Nothing or no one can be compared to God,” uses 50 words, which is a famous verse from the Holy Quran that many Muslims memorize and read daily. The decision to employ 40 words when the research followed quantitative approaches and 50 words when the study followed qualitative or mixed methods approaches was based on these two notions. Therefore, it was necessary to ensure that the written summaries were between twenty and twenty-five words long so that readers could read and understand them.
Figure 6: Ladder diagram – Examples of development theory from literature review.

Figure 7 focuses on research theory through the identification of construct theory, which made sense and fulfilled all the standards of rational and logical thinking based on analysis of relevant studies from the literature and where the researchers’ psychological processes are guided by the sequential way in which they perceive experiences. A construct summary overviews the main facts, phenomena, and conclusions supporting the theory’s strong argument. It was the development of the existing knowledge content in multiple disciplines and aimed to improve our understanding of a research guide (base of research, body of knowledge, and research core), even if it had no practical application. "Methodological theory" is research that depends on reality and scientific extrapolation where the researcher makes some observations and experiments for a specific purpose formulated by precise formulation, specific and quantifiable, aiming to apply the results to solve current problems.
To collect meaningful data, all specialists from different fields of research and sciences agreed that a solid theoretical framework must first be established. A literature review would not be done until much later in the process of developing a new theoretical framework or doing validation research. For instance, the quantitative strategy techniques of surveying and experimenting are known as the hypothesis approach. The development of the theoretical framework occurred later once the benchmark, problem statement, research question, and literature review were constructed. If the findings were inconsistent with the original hypothesis, the researcher had to undertake a second literature review along the same line as a case study, which follows the qualitative strategy known as the "proposition" approach. As part of grounded theory, researchers collected and analyzed data in cycles until they reached a peak point. In addition, the researcher did a second literature review to corroborate the findings of the initial theoretical proposition.

On the contrary, there were narrative and phenomenology methods that the researcher did not need to apply for the second literature review because it was based on original proposition theories. Researchers constructed propositions as the first stage of the mixed methods research strategy. The investigation moved on to the following inquiry strategy after the first phase was done. The theoretical proposition or hypothesis was verified through the latter method of inquiry. When planning their research processes, researchers urged using a monochromatic color scheme corresponding to the actions outlined in one of the research guides. Only two inquiry strategies (ethnography or archival materials) enabled the researcher to start collecting data as soon as the main research question was settled. It is essential to mention here that the researcher must verify each incremental theoretical proposition until no new findings emerge after at least three iterations.

It is crucial to remember that every scientist doing research must be able to adopt a method for forming a theory. Without a theoretical framework, a study cannot be considered
scientific, where the researcher must give evidence of systematic and verifiable research to back up the resultant new theory. By focusing on the contribution of existing knowledge, researchers were expected to develop new knowledge during their research journey, especially at the doctoral level, such as new integrated knowledge theory, model development, new integrated guideline, framework, process, system, proof-of-concept prototypes or artifacts, between others, aiming to obtain a new degree in the academic field as well as to integrate with the existing body of knowledge that leads to a significant impact to the world and potential investors, especially in the field of science and industry.

**Semi-Structured Questionnaire**

The participants shared their ONDAS framework experiences by responding to eight approaches:

1. Social pressure and motivation for continuing your research;
2. Determining a thesis structure and level of research;
3. Identifying research gap from benchmark works;
4. Identifying research guides to establish new literature review;
5. The importance of literature review that embraces the need of research;
6. Understanding the inquiry of strategy to establish research questions;
7. Understanding the methods and components of research process and design;
8. Having strong confidence to defense your research proposal, through an online semi-structured questionnaire.

There were instructions for each question, guiding participants to the right path. Nonetheless, they were given a chance to voice their own opinions. By asking these questions, all responders gained scientific self-assurance after using the ONDAS framework in their research proposals, which will aid them in future viva voce defenses. A fact was that it was possible to use as an indicator of consensus a 100% response rate of agreement (32 respondents strongly agree, eight respondents agree). It was also tried to track participant responses from various disciplines; this data may be helpful as they seek new approaches to themes like research methods, management, research tools, and psychology.

**Figure 8**

*NVivo result tree for the word thesis*
The resulting insights guided the study as it synthesized the perspective on students' experiences in the research process, where it was found that believing in one's fortitude and ability in the face of challenge is a hallmark of self-confidence. A self-assured person is up for whatever comes their way, seize chances when they arise, is unfazed by setbacks, and accepts full responsibility for his or her actions and outcomes.

**Figure 9**

*NVivo result tree for the word research*

From that view, the ONDAS framework aimed to build students' confidence that may have far-reaching implications for their personal development and resilience in the face of adversity towards the research path. Students with a healthy amount of self-confidence know their abilities and are humble enough to recognize their weaknesses, working to develop both. Here, ONDAS framework could help in both industrial and academic performances, where several areas may benefit from increased self-assurance. In conclusion, it was discovered that when 40 respondents employed the framework, they could clearly define their problem statement through benchmark works, clearly identify their research guides to establish new theoretical literature focus, and clearly describe their findings through the main RQ, sub-RQs, and ROs. Students were also allowed to assess the depth and sophistication of their study and have a clearer idea of where they were headed from the get-go. In addition, they were able to have a strong defense towards their research path, especially when creating their theory and how it could link the theoretical framework to data. They were more likely to contribute significantly to existing bodies of knowledge than their colleagues who used more conventional techniques.

Moreover, the strength and cohesiveness in the research process and management could be achieved by connecting the importance of ten knowledge categories derived from a book on project management with actually given scenarios. In "research guides integration," for instance, it was implied that the construct elements of the LR structures were well-defined. "Scope of study" defines a study's main RQ, sub-RQs, ROs, and research topic. ONDAS framework phases of planning and design are referred to as the "research schedule." For example, if you were to emphasize the term "time (duration of study)," you would be drawing attention to a flowchart and Gantt chart that was designed to illustrate the steps involved in doing the study and the timeframe during which they took place. We did this by focusing our attention on the quality and significance of research, which highlighted the originality and benefit of the students' projects. To define what is meant by "research resources," a research model and root diagram are provided. Concerning the topic of "communication with specialists
and supervisors," it was important for students to identify the primary contacts in their academic and professional networks which could provide guidance and support as they pursue their studies.

On the other hand, "the originality and research risk" implied that students needed to demonstrate and detail a knowledge gap in their field of study, while "budget" refers to figuring out which resources will be used for data collection, analysis, and verification. Like "communication with specialists and supervisors," stakeholders should be contacted regularly to check the students' research progress. Finally, ONDAS framework helped to achieve research innovation by facilitating the acquisition of high-impact, high-quality research at a reduced cost and without compromising the timeliness with which researchers may earn their degrees. Presenting a research workflow plan designed around key research management process tactics is crucial (Figure 10).

**Figure 10**
*Design of a research workflow scheme*

![Research Workflow Scheme](image)

Furthermore, findings in the "research brain-methodology and methods" stage served as a valid check on whether the student's planned research methodologies provided sufficient data to finish their theses. At this point, students began to make connections between their data and theoretical frameworks to do exploratory research and establish strategies for a positive data collecting, analysis, and validation process. Here, the method emphasized exploring undiscovered territory in search of novel, inventive solutions that may have patentable potential. In conclusion, it was possible to identify theoretical components; determine the technique for collecting, analyzing, and validating main components; double-check the research methodology; and finally, draft the research methodology framework. By gradually exposing them to the interconnection of all the study components, the semi-structured questionnaire helped ONDAS framework to increase respondents' confidence in their potential to finish earlier and have a chance to graduate on time. Therefore, ONDAS framework interconnected all research components using the main research question as the basis for the design, with their sub-research questions, objectives, main title, methodologies to be adopted,
data collection, data analysis and validation technique, expected results, limitation of the research, contribution to existing knowledge, research model, knowledge claim, article analysis, thesis analysis, and any other type of research paper that should be inserted to cover the construct elements for literature review, as well as the stages to develop theory from their LR to have final proposition/hypothesis theory.

**Table 1**

*Identification of the main themes, stages, strategies, and actions for the ONDAS framework*

<table>
<thead>
<tr>
<th>Theme</th>
<th>Goal</th>
<th>Phases</th>
<th>Strategy</th>
<th>Action</th>
<th>Research Philosophy</th>
<th>Reference to the Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyze a specific benchmark</td>
<td>Follow the same research design method, techniques, and criteria for validation</td>
<td>Justifying the gap and confirming the problem statement to be proved by the selected benchmark</td>
<td>Epistemology</td>
<td>(Rawlinson, 1986); (Lowe et al., 1991); (Albrecht, 1992); (McInerny, 2005); (Smith &amp; Hitt, 2005); (Paltridge &amp; Starfield, 2007); (Ibrahim, 2011); (Barbie, 2012); (Salkind, 2012); (Creswell, 2013); (Yin, 2013); (Kallet, 2014); (Morais &amp; Brailsford, 2022); (Project Management Institute, 2017); (Wilson, 2017); (Walliman, 2018)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identification of constructs’ elements</td>
<td>Base the research through inquiry of strategy</td>
<td>Confirming the problem statement to have: Main RQ, Sub-RQs, ROs, Title of research</td>
<td>Epistemology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research Brain-Methodology and Methods</td>
<td>Establish the proper method, strategy, technique, and variable analysis depends on the nature of the research</td>
<td>Linking Theory to Data</td>
<td>Ontology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identification of constructs’ elements</td>
<td>Design the level of study (Bachelor, Master, Ph.D. studies)</td>
<td>Establishing the research guides (Base of Research, Body of knowledge, Research Core)</td>
<td>Epistemology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stage 4</td>
<td>Guide the constructs’ elements description</td>
<td>Identifying the expected results and contribution of existing knowledge through RQs and ROs.</td>
<td>Epistemology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matryoshka Model</td>
<td>Stage 5A</td>
<td>Cover sub-themes (Topics) of constructs’</td>
<td>Filtering (any secondary data) such as papers, thesis, archival,</td>
<td>Epistemology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research Tools</td>
<td>Stage</td>
<td>Description</td>
<td>Method</td>
<td>Domain</td>
<td></td>
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<td>----------------</td>
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<td></td>
</tr>
<tr>
<td>Identification of researchers' background</td>
<td>Stage 1</td>
<td>Find the research challenge and motivation</td>
<td>Grounding initial &quot;Research Problem and Benchmark of the Study.&quot;</td>
<td>Epistemology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analyze a specific benchmark</td>
<td>Stage 2</td>
<td>Identify new contributions to existing knowledge</td>
<td>Confirming NEW outcomes through comparison from previous work and current study</td>
<td>Epistemology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Critical analysis for writing and avoiding plagiarism</td>
<td>Stage 5B</td>
<td>Analysis LR and use a mind plan to organize related works from</td>
<td>Establishing a NEW literature review</td>
<td>Epistemology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Root Diagram</td>
<td>Stage 5C</td>
<td>Prove knowledge structure</td>
<td>Presenting the main concepts of each related work under the scope of the construct's element</td>
<td>Epistemology</td>
<td></td>
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</tr>
<tr>
<td>Literature Map</td>
<td>Stage 5E</td>
<td>Discovering and exploring connections between scholarly research</td>
<td>Organizing the NEW literature review by using labels and connection lines</td>
<td>Epistemology</td>
<td></td>
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</tr>
<tr>
<td>Results of Key Findings</td>
<td>Stage 7</td>
<td>Analysis and organize the new key findings from primary data sources</td>
<td>Explaining deeply the results of NEW outcomes by searching for value and ethics</td>
<td>Axiology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow chart and Gantt Chart</td>
<td>Stage 10</td>
<td>Assist researchers in following a designed workflow framework; Show job pieces, duration, and milestones (Gantt Chart)</td>
<td>Visualize and relate all aspects of the research components, to work as a quick reference for the whole thesis process; Project implementation plan</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step</td>
<td>Stage</td>
<td>Description</td>
<td>Theory/Model</td>
<td>Knowledge Area</td>
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<td></td>
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</tr>
<tr>
<td>1</td>
<td>1</td>
<td>Identification of researchers’ background</td>
<td>Establishing initial Problem statement</td>
<td>Epistemology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>Identification of constructs’ elements</td>
<td>Establishing the constructs’ element (Base of Research, Body of knowledge, Research Core)</td>
<td>Epistemology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>5D</td>
<td>Ladder Diagram</td>
<td>Development theory from the literature</td>
<td>Build/Test a theory</td>
<td>Epistemology</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>Research Brain – Methodology and Methods</td>
<td>Matrix of Actions in Theoretical Constructs</td>
<td>Identifying Research Theory Actions</td>
<td>Ontology</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>Knowledge Claim</td>
<td>proves the new contribution to the existing knowledge</td>
<td>Using ONDAS Framework ©® Model to link theoretical approaches into Practice</td>
<td>Axiology</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>9</td>
<td>Abstract of the project</td>
<td>Express the thesis/paper (or central idea)</td>
<td>Suggest any implications or applications of the research that the researcher discusses in their thesis/paper</td>
<td>Epistemology + Ontology + Axiology</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Abstract of the project</td>
<td>Implementation of key concepts toward research approach</td>
<td>Epistemology + Ontology + Axiology</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In sum, ONDAS framework aided in achieving novelty of research by allowing for the acquisition of high-impact, high-quality research while simultaneously reducing costs and allowing researchers to complete their degrees on time. Establishing the integration of the four main levels (research methods, research tools, management, and psychology) that aid in developing ONDAS framework, can be achieved through data triangulation (Figure 11), including three different data sources (archival analysis, case references analyses, and semi-structured questionnaires).
Giving attention to the most influential thinkers on the theme of research methods, for example, Barbie (2012), this emphasizes the method by explaining how to plan and execute a project, how to conduct different types of observations, and how to deal with pressing issues in research methodology. Here, it includes designing and executing online surveys and interpreting qualitative and quantitative data. This study takes advantage of what has been done by this author to improve the way of applying different quantitative and qualitative methods more quickly and simply by the use of direct forms and directions for students to follow. Unlike Barbie (2012), Salkind (2012) specifies data collection and analysis methods and gives detailed guidance on developing a study proposal and writing a paper. This expert has also said that the most prevalent research models in the social and behavioral sciences are used, including qualitative techniques.

Moreover, he also discusses the measuring procedure, research process, topic selection, sample, generalizability, and more. In ONDAS framework, the focus is given not just on the paper writing but also on the entire research process, where the guides, placed by Salkind (2012) are expanded and described more understandably. This focus showed an advantage in driving the research process, where participants could understand the directions and tasks they needed to do without problems or essential questions.

Creswell (2013) offers an introduction to philosophical assumptions, a survey of relevant literature, a critique of theoretical research approaches, and some personal views on the value of writing and ethics in academic study. In addition, he outlines the fundamentals of
the research process, detailing the various methods in depth. This scholar has a greater focus on worldview and a more in-depth discussion of ethical considerations in research, in addition to the significant revisions made to the section on mixed techniques. Being one of the leading scholars regarding research methodologies, Creswell (2013) was also used as the central concept for this research. Identified by many students as "difficult to understand" (Creswell, 2013; Yin, 2013), concepts were used in this research in a more transparent way, where participants agreed that after using ONDAS framework, the concepts were quickly implemented and used and that after their work with this framework, Creswell (2013) also became easier to understand.

Paying particular attention to Walliman (2018), the author yields a broader valuable resource for learners and professionals in many fields, including the natural sciences, the social sciences, and the humanities, separated between an introductory section that discusses what knowledge is and why it is important, and a more in-depth section that details the steps necessary to design, implement, analyze, and report on a research study. Also, here, results from participants showed that the use of ONDAS framework forms was an advantage for all the research project phases, focusing on all the phases since their very beginning and not just the main one, as stated by this scholar.

Management research's political and ethical implications are also discussed, along with the philosophical assumptions behind study design and the selection of various methodologies. Participants were also given access to guidelines that drive readers through the "fundamental" steps of conducting a research study, from conceiving an idea to presenting the results (Lowe et al., 1991; Smith & Hitt, 2005). However, not only do the authors detail their seminal works in the field of management theory; they also provide insightful commentary on the creative process by detailing how they formulated their ideas. Since so little has been written about the process of theory development from those who have been involved in building theory, the result is not only an ambitious and original panorama of the key ideas in management theory presented by their originators but also a unique collection of reflections on that process. Once again, using the ONDAS framework, through its ladder diagram, helped participants achieve their research theory, where the majority described it as an "easy and intuitive mechanism."

Although Paltridge and Starfield (2007) and the Project Management Institute (2017) note that the conventional view of the supervisor-student connection is that of an apprenticeship, where most of the learning is tacit and the student is expected to resemble the tutor in many ways, there are other models for this interaction. Unfortunately, many supervisors find it difficult to guide non-native speaking students to completion due to the changing demographics of higher education and the imperatives of increasing responsibility and support for research students. Participants' answers confirmed that with ONDAS framework, the students’ work was more specific and freed their interactions with the supervisory committee. Though meeting with supervisors is essential, participants stated that "ONDAS made it easier for us to define our studies and present our ideas to our supervisors, getting help on specific points and processing at a better speed through our studies."

Giving attention to the most influential writers and philosophers in the field of psychology, brainstorming is the most well-known method for generating new ideas and finding original solutions to problems, as shown by the examples of works that have considered the points made by Rawlinson (1986). This expert starts by pointing out the obstacles to original thought and then demonstrates how they may be overcome. It then lays out a systematic plan for running productive brainstorming sessions and assessing the quality of the ideas generated. Therefore, when students design their problem statement, they should always seek the research gap and purpose of the study to obtain novelty in their research. On the other hand, Albrecht (1992) mentions “Brain Power,” which presents the six functional thinking talents that researchers need to develop to think creatively and flexibly. As kids become more
flexible thinkers, they learn to pick out relevant information, organize it sensibly, and spot and avoid fallacies in their reasoning.

According to the results of his research, coming up with original solutions to problems is important in all walks of life. Therefore, when applying ONDAS framework to different ages, they identified construct elements to build a new literature review. Also, when finishing their coverage topics, they became able to compose a construct summary per each construct element before finding their research theory, where many of them stated that, “by the use of the construct elements, it was easier for one to develop the related covered topic, hence, to summarize them towards a research theory.” For McInerny (2005), "logic" refers to the capacity to construct clear and convincing arguments once that go logically from established premises to supporting evidence and, ultimately, a credible conclusion. However, it is necessary to study and comprehend illogical thinking to hone one's talents and safeguard against incoherent or purposely misleading reasoning. This expert has included concise analyses, easily understood examples, and insightful conclusions in his study. As a bonus, he discussed the causes of illogical thinking, such as overconfidence and myopia, and then analyzed the strategies that the illogical use in place of sound logic, such as red herrings, diversions, and oversimplifications. Here, it is important to understand that when the researchers were using the "Matryoshka Model," it gave an easier way to achieve systematic literature built with a solid critical analysis of their writing.

Participants stated, “A systematic analysis allowed a more precise data review, filtering information and focusing on the necessary data only, consequently avoiding dispersal from the central topic.” Specifically, we emphasize Kallet (2014), which established a pragmatic framework and a set of tools to apply critical thinking skills to common business situations. Think Smarter contains real-world examples that show how the tools operate in action and hundreds of practice activities that can be used across sectors and functions, making it a helpful resource for individuals, managers, students, and corporate training programs. In ONDAS, it was applied Stage 6 to help link theory to practice as approached with the "truss structure model." This step involved double-checking the researcher's chosen research approach to ensure it would provide all the information needed to finish the study. Data collecting, analysis, and validation became a more pleasurable process thanks to the tools they used to investigate and plot out the best approach. This procedure reaffirmed the company's hallmark of venturing into unfamiliar territory in search of novel, inventive solutions, some of which may be worthy of patent protection.

Addressing Wilson (2017) has centered his work on the foundational ideas of critical thinking, which provides helpful advice and straightforward procedures for efficient issue resolution. Surprisingly, the advice offered is broader than a specific issue. Instead, the researcher's attention may be directed at them to address many problems. However, the book's easy-to-follow instructions apply to more than one field. They may be used in every field and any aspect of life. Because 40 participants were using this framework and constantly in contact with their supervisory committees, brainstorming was visible throughout the process, not only among students and professors but also among students who did not use the framework. Participants stated that "using this Framework motivated us to discuss our topics, not only with our supervisors but also among us students, where we used to help each other with our studies." It is also necessary to highlight the work of Ibrahim (2011) that introduces a visualization tool created by a faculty in the built environment to describe the three-year path that seasoned construction experts often take to answer their research questions. She suggested using a self-filled instrument called an "Eagle Table," based on the frameworks of three research constructs. The first step in adding new constructs to the Eagle Table is to recognize the ones inside a particular research question. She demonstrated how a tabular presentation of these three types of research constructs effectively summarized the process of completing a Ph.D. dissertation.
Also, Morais and Brailsford (2022) provide an example of using information and communication technology in the Ph.D. research process. As a first step, they looked at how other people have approached the problem of knowledge visualization and how studies are often set up. After that, they gave a presentation on the "idea puzzle program." Using Philosophy of Science principles, they arrived at the conclusion that using the idea puzzle program encouraged visual integrative thinking that led to more logical study plans. However, there is still an existing gap in research methodologies and methods available to under and postgraduate students, including bachelor’s, master’s, doctoral, and other types of researchers. It takes, as the main target, the development of the ONDAS framework to help the research process, focusing on the study from its very beginning and until the viva voice discussion, decreasing the time of writing and preparation, guiding the research and strategy processes, and promoting a set of tools to help on the analysis and elaboration of the final report (Figure 12).

**Figure 12**

*Knowledge structure – root diagram adopted from ONDAS framework*

Taking advantage of Ibrahim (2011) and Morais and Brailsford (2022) experiences, ONDAS framework uses graphical forms and color themes to guide the students and help them perceive the main areas quicker and more precisely. Participants showed great motivation and satisfaction while using the different forms and tools provided on ONDAS, where the majority stated that "when the information is placed in strategic positions within a graphic or diagram, makes it easier for one to understand the ideas and then write about them."
Conclusion

Based on the three proposed objectives having a global impact on the scientific community and complementing each other, this research has outlined: the identification of the most important challenges students experienced during studies, the analysis of benchmark works through knowledge structure to have a foundation for developing a framework and present ONDAS framework's characteristics, procedures, and rules to be utilized across multiple disciplines. A qualitative method fits this research in the way that it is used for the development of this innovative research methodologies and utilization across multiple disciplines called "ONDAS framework," capable of helping the research process, focusing on the study from its very beginning and until the viva voice discussion, decreasing the time of writing and preparation, guiding the research and strategy processes and promoting a set of tools to help on the analysis and elaboration of the final theses.

Due to the nature of this research and its research objectives, it was necessary to study more than one data source to provide reliable data about the mentioned point. Also, using an explanatory case study, it aimed to answer the main research question, explaining how the development of the ONDAS framework should be conducted and done through knowledge structure. Therefore, this framework is supported by data triangulation through validation, including three different data sources (archival analysis, case references analyses, and semi-structured questionnaires), in boosting respondents' assurance in their ability to graduate on time by methodically exposing them to the interconnectedness of all the study components.

This study reveals to the scholarly community how researchers may plan and construct their studies based on their overarching research problem. ONDAS framework is meant to help researchers spend more time perfecting their research procedures by conducting a narrower literature review without losing sight of the big picture as they near the conclusion of their studies.

Various research projects from different fields of study (natural sciences; engineering and technology; medical and health sciences; agriculture sciences; social sciences; and humanities) benefit from this novel research paradigm, which has helped seasoned practitioners overcome their early bewilderment and doubts. Researchers felt more at ease with the unknown after being given a glimpse into the length and difficulty of the research journey, which typically lasts two years for master's degrees and three years for doctoral degrees, thanks to an introduction that provides an ONDAS framework view of the timeline and workflow. ONDAS framework may be used elsewhere when experts call for new, cutting-edge methods to be developed via further scientific research to address long-standing issues in the commercial sector. To start a study before diving into a massive literature review, specialists advise using the ONDAS framework. It is also suggested as a primary guide for concentrating on the growth and refining of certain theoretical constructs in the course of subsequent research. That is why the ONDAS framework is constantly being refined so that it may become the guiding light on a path to discovery that, without it, could go nowhere.

This framework has evolved into a useful resource for thesis supervisors to use when passing along their specialized expertise in the research process. When the collected and analyzed data are considered improper or sufficient for ending a master's or doctoral thesis, having a beacon of light to lead the study is much preferable to modifying the original research approach or, worse, changing the main research. Our long-term objective is to retain as many working professionals as we can and help them graduate so that they may serve as academic-industry liaisons. This study contributes to proposing the theory of:

ONDAS framework is a multi-disciplinary researchology's development theory that endeavors to provide a comprehensive explanation of the fundamental
principles of scientific research, with the objective of exploring uncharted areas of knowledge to discover novel and innovative solutions with the potential to be patented, and ultimately revealing the secrets of knowledge (ONDAS Framework, 2023).

This study's limitations lie in its exclusive emphasis on university education (i.e., under/graduate school, postdocs researchers), excluding the high school curriculum.

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Disciplines and Innovative Research Methodologies aiming to help many professionals to complete their postgraduate studies successfully. From 2008 to 2011, he was a network engineer with the City Hall of Beja, Portugal, and from 2011 to 2013, he was a lecturer with the Department of Engineering at the Superior School of Technology and Management, Polytechnic Institute of Beja, Portugal. Currently, Dr. Franco has become the main supervisor and co-supervisor for postgraduate theses, as well as co-founder of ONDAS Academy and CTO at Apina's Foundation in NY, USA. Moreover, Dr. Daniel is working as a scientific reviewer for IEEE and Emerald. Since 2014, he has been the head of the IT department at the City Hall of Alcácer do Sal, Portugal. Dr. Franco’s awards and honors include first place in the Summer School on Information and Communication Technologies and Law, Istanbul Kemerburgaz University, Turkey. Dr. Franco has an M.Sc. degree in computer security engineering from the Polytechnic Institute of Beja, Portugal, in 2014 and received a B.Sc. degree in computer engineering from the Polytechnic Institute of Beja, Portugal, in 2007. Please direct correspondence to: daniel.franco@ipbeja.pt.

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Acknowledgements: The authors acknowledge the contribution of students in the FIC “Fundamentos de Investigação Científica/Research Methodology for Postgraduate studies” from semester I (2021/2022) until semester I (2022/2023) course at Instituto Politécnico de Beja. The authors would also like to extend their gratitude to the respondents who filled out questionnaires from online workshops held in (LA- the United States, Beja-Portugal, KL-Malaysia, Larnaca- Cyprus, and Erbil- Iraq).

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Article Citation