ABSTRACT

FACTORS AFFECTING RESEARCH COMPETENCIES IN HEALTH STUDENTS FROM A PRIVATE UNIVERSITY IN NORTHERN MEXICO

by

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ABSTRACT OF GRADUATE STUDENT RESEARCH

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Title: FACTORS AFFECTING RESEARCH COMPETENCIES IN HEALTH STUDENTS FROM A PRIVATE UNIVERSITY IN NORTHERN MEXICO

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Problem

The hypothesis of the present study was as follows: The empirical model, in which the self-perception of information skill impacts the self-perception of the attitude towards research and investigative competencies, does it have a goodness of fit according to the theoretical model in medical and odonatologist students at the University of Montemorelos, Nuevo León, Mexico?.

Methodology

The present investigation was quantitative, explanatory, predictive, descriptive and cross-sectional. The type of sampling carried out was non-probabilistic, intentional,

and for convenience and 299 university students participated. To perform the hypothesis test, the statistical technique of structural equation models was used.

Results

According to the calculated model, the following values were obtained according to the indices used: CMINDF = 3.49, CMIN = 4.49, *p* = .061, RMESA , .08, AGFI = .94, GFI = .99, GFI = 97, TLI = .97, NFI = .99, CFI = .99 and RMR = .00). According to the adjusted model the p-indices of the chi square, RMESA, AGFI, GFI, GFI, TLI, NFI, CFI, and RMR) contain very acceptable values.

Once the model is accepted, it is observed that the exogenous latent variable of self-perception of information literacy (γ = .30) is a direct predictor of the attitude towards research. The need for research information and registration is a direct predictor of the attitude towards research (γ = .48). The attitude towards research is a direct predictor of investigative competences (γ = .40), and the self-perception of information literacy is a direct predictor of investigative competences (γ = .39).

Conclusions

The empirical model had an acceptable goodness of fit in accordance with the theoretical model, since most of the indices reached adequate values. It is concluded, to the extent that the level of perception of information literacy improves, the need to record information and research and the attitude towards research will improve the research skills of the students who answered the questions at a better level instruments used in the study.

Montemorelos University

School of Education

FACTORS AFFECTING RESEARCH COMPETENCIES IN HEALTH STUDENTS FROM A PRIVATE UNIVERSITY IN NORTHERN MEXICO

A dissertation
presented in partial fulfillment
of the requirements for the degree
Doctor in Education

by

William Joseph Jean-Charles

April 2023

Dedication

This thesis is specially dedicated to my wife Myrline Jean-Charles. After twenty-three years of marriage Where we had to face many difficulties that could have shaken us if Our God did not help us, we were both able to continue our studies in order to be more useful. Myrline wanted to see me move forward and thus greatly contributed to my success in this second doctoral program. For having consented to so much sacrifice, so much renunciation and fact, allows me to succeed in this long-term program which required, time, money, energy which had to be used for the well-being of the family, I dedicate to you Myrline my dear and loving wife the success of this program. This essay is also dedicated to my two children, Willessie and Myrlinski, who have suffered from my lack of time for them. May the success of this doctoral program in education be a rich blessing to my entire family.

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With all my heart, I would like to thank my wife Myrline, my daughter Willessie and my son Myrlinski who all supported me in this study. Having reached the end of this long period, I can only say thank you, because without you, it would have been impossible for me to have succeeded.

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CHAPTER I

PROBLEM DIMENSION

Introduction

In this chapter, the background of the problem is presented, which includes the approach and approach of the problem, the research hypothesis, the objectives, the justification, the limitations, the delimitations, the philosophical framework and the definition of terms.

Background

Informational Skill

Holden (2012) points out that in educational institutions, information literacy has become an integral part of the curriculum in different disciplines, such as chemistry and biology, especially in science and engineering programs. For your part, Ward (2006) says that our educators are responsible for fostering and committing to information literacy that can make a difference in the modern world.

According to Badke (2011), “information literacy remains invisible, and few people recognize that there is a problem to be addressed. It is the nature of higher education to perpetuate its past successes when the world changes and not recognize the impending threats to its future” (p. 139). In the words of Beile (2005),

> information literacy, with an emphasis on critical thinking and problem-solving skills concerning an individual's need for information, has recently been recognized by educators and business professionals alike as critical to success in a rapidly changing environment, intensive in technology and information. (p. 4)

Library employees in educational institutions must help build students' information skills, which can form a critical mind and provide the student with a rich education (Cordell, 2013).

Attitude Towards Research

Conceptually, the attitude toward research is considered a system of beliefs, feelings, and dispositions toward research by students or teachers (Aldana de Becerra & Joya Ramirez, 2011). Bolin et al. (2012) point out that many students may negatively approach research. However, when students manifest high self-esteem, they may develop more interest in research and be less anxious about it.

For their part, Papanastasiou and Zembylas (2008) found that students' anxiety or attitudes towards a particular course, such as research, can cause severe problems in their learning process and academic performance. Griffoen (2019) comments that when students have an investigative attitude, it is significantly related to the intention to conduct the research after finishing their academic preparation, already as professionals.

Papanastasiou (2005) points out that many students generally consider research a helpful element in their professional and personal lives. Therefore, they maintain a positive attitude and keep the research courses simple.

Research Competencies

Some researchers (Bélisle, et al., 2021; Vasquez, et al., 2021) comment that educational institutions currently base their teaching on competencies, they must teach courses that need complicated and relatively high techniques, such as research, to achieve the objectives of learning that are needed.

Prosekov, et al. (2020) state that "the development of investigative competence is the result of education. Competence as a new mental formation is developed by mastering certain activities during the learning process. The phenomenon includes knowledge, skills, personality traits, and personal qualities" (p. 594).

To acquire skills, people need to obtain interdisciplinary training. As you point out, Howard, et al. (2013), the student acquires the investigative competence to carry out formal investigations. In addition, they must carry out research projects that allow them to acquire and put these skills into practice (Hamnett & Korb, 2017).

Definition of Terms

The terms used in this study are presented below.

Information Skill: It is the ability to think critically and to recognize when you need information; that you can locate, evaluate, and effectively use the information that is available (American Library Association (American Library Association, 1998).

Attitude Towards Research: It is a system of beliefs, feelings, and dispositions towards research by students or teachers (Aldana de Becerra & Joya Ramírez, 2011).

Research Competencies: It is the set of knowledge, abilities, attitudes, and skills that are required to develop an investigative activity, in which a training process is necessary (Abella Mahecha & Pachón Soler, 2011).

Relationship Between Variables

The relationship between the variables considered in the study is presented below.

Information Skill and Attitude Towards Research

The subjects with a certain degree of difficulty that a student takes generate negative attitudes, affecting their emotional state. Choosing a specific way when a student does not know how to search for required information generates a negative attitude toward research. In this regard, Pinto (2010) says that for students to become information literate in any area, they must be motivated, and that attitude will help them face these difficulties.

As Ogunlana, et al. (2013) and Adebamigbe (2004) pointed out, attitude is the most influential factor in the acquisition of literacy skills by students. Therefore, attitude is related to information literacy.

Information literacy and Research Competencies

According to the European Commission (2004), research skills are a transferable package of knowledge, skills, and attitudes that people need for their training, which includes acquiring a critical mind and knowing how to choose the appropriate and helpful information.

According to Wen and Shih (2008), information literacy is required for the possession of the knowledge, skills, and attitudes necessary to collect, analyze, evaluate, organize, and synthesize information in an investigation that is carried out. For his part, Newton (2005) says that knowledge of information literacy goes hand in hand with knowing when there is a need for information, the resources available, and how to find

information, evaluate, and share their research findings. The Middle States Commission on Higher Education (2003) notes that a student with information literacy skills can pose a research question with breadth and depth. You know where to look for information and the sources of information.

Attitude Towards Research and Research Competencies

Currently, there is a significant boom in the field of research. The institutions should be more concerned about improving this aspect. However, it seems that it has little impact on developing investigative skills and forming positive attitudes toward scientific research in students and teachers (Ruíz Bolívar and Torres Pacheco, 2005).

Serrano (2022) conducted a study evaluating the impact of attitudes toward research and investigative skills after taking research course two with a sample of 60 students. For the analysis, a t-test for related samples was obtained. It was found that there is a significant relationship between how students feel about research and how they develop their research skills throughout the course. A significance level of 1% was obtained, and the t stat value is 3.49, which is greater than the critical t of 2.445 and falls in the rejection region.

Abun (2021) points out that research is generated in many professions, neither education nor business. The reason is simple, only some professionals have a good or positive attitude towards research and need more knowledge and skills for research. For his part, Hofmeister (2007) says that the result of a positive attitude towards research is to have skills or knowledge about research.

Ünver, et al. (2018) found a positive correlation between the average age of the participants and their positive attitude toward research. Because the older ones had done more research and had acquired more skill and experience (r = .119, p = .021).

Some researchers point out that the negative attitude of students to research is mainly due to the lack of training or skills in research and the lack of knowledge about it, which produces anxiety and depression (Al Furaikh, et. al, 2017; Kumari, et al., 2018).

Problem Statement

Currently, undergraduate and postgraduate educational institutions emphasize researching to conclude their educational project. They try to instill in their students the necessary skills for scientific research, and in some cases, they emphasize the statistical part. Despite the effort that teachers and administrators could make to promote a taste for research, it is observed that students show a negative attitude when starting an investigation. Research skills are a requirement of institutions, especially in postgraduate courses.

Currently, there are problems related to the quality of research and critical thinking among students in general. According to Rao (2013), combining investigative skills and critical thinking can be essential to achieve academic excellence. In addition, acquiring research skills provides students with learning opportunities, which is essential for their professional development (Berner & Adams, 2004).

According to Showman, et al. (2013), for a student to acquire research skills, the student must develop some elements, such as being organized, good judgment,

effective communication, creativity, and persistence. These elements will help you conduct a successful investigation.

According to some authors, to master investigative skills, the student must handle some tools, such as technology, among others (DiPerna, 2004; Rychen & Salganik, 2003).

According to Papanastasiou (2014), one of the students' deficiencies when doing research and using the statistical part is the need for more skills, which leads them to not do well in the courses. Hence, the student must have investigative skills to have a positive attitude because that gives him confidence. As Byrne, et al. (2020) and Ebenezer, et al. (2020), when they have positive attitudes, students can master a particular teaching program and learn science.

The students of the School of Medicine and Dentistry of the University of Montemorelos, in their time at the institution as part of their study program, have to comply with a research path, which begins with the acquisition of skills with the course of Scientific Literature, followed by the development of the investigation, to then continue with the scientific writing workshop and conclude with the investigation I, II, III, and IV, where the student will be able to conclude his investigation.

Therefore, the objective of the study is to know if the empirical model, in which the self-perception of information literacy impacts the self-perception of the attitude towards research and investigative competencies, does it have a goodness of fit according to the theoretical model in medical and odonatologist students at the University of Montemorelos, Nuevo León, Mexico. The study will be conducted with students from

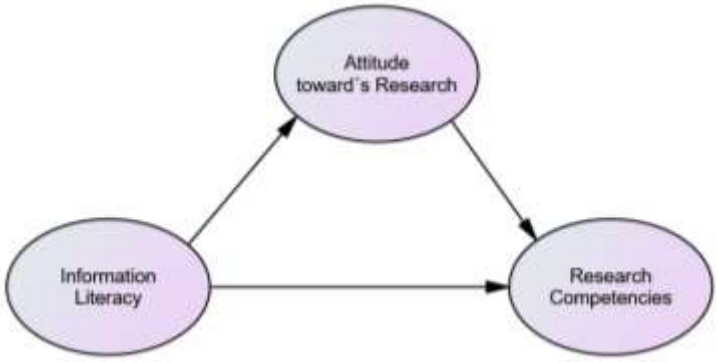
the School of Medicine and Dentistry of the University of Montemorelos, Montemorelos, Mexico.

Research Question

In the present investigation, the approach to the problem of the present study is as follows: The empirical model, in which the self-perception of information skill impacts the self-perception of the attitude towards research and investigative competencies, does it have a goodness of fit according to the theoretical model in medical and odonatologist students at the University of Montemorelos, Nuevo León, Mexico? (see Figure 1).

Figure 1

The Theoretical Model



Hypothesis

The hypothesis proposed in this study is the following: The empirical model, in which the self-perception of information skill impacts the self-perception of the attitude towards research and investigative competencies, does it have a goodness of fit according to the theoretical model in medical and odontologist students at the University

of Montemorelos, Nuevo León, Mexico.

Research Objectives

The proposed objectives for this research are the following:

1. To identify and evaluate the attitudes and skills acquired in the research pathway linked to developing research competencies.

2. To evaluate the degree of influence that attitude and informational skills have on research competencies.

Justification

The study is justified because no studies have been carried out involving the rout of research for Montemorelos University and the model studied in the population considered. The study of information literacy is beneficial for developing research since it allows you to acquire skills and abilities to appropriate knowledge that will be useful in your academic development. In addition, as Tarriba Cancino (2018) points out, "information literacy needs skills and confidence to use the information obtained, use the critical side and understand each element that includes the information given or found" (p. 17).

Other studies leaded by (Amavizca Montaño, 2019; Pinto & Uribe-Tirado, 2017; Lewandowsky, 2020) agree that information literacy has led to a change in the educational role of libraries and librarians, hence the importance of carrying out this study.

Therefore, it must be understood that open science is here to stay and is a reality today, especially in the research field, which implies challenges (Uribe-Tirado, et al., 2020).

Another element included in this study is the student's attitude toward research. As Hussain, et al. (2016), "a positive attitude towards research is key to success and progress in knowledge-based societies" (p. 113). Although students can also express negative attitudes, it becomes a burden during their academic development.

Regarding research competencies, Matta (2017) considers that investigative competencies are a complex capacity, different competencies are needed to be able to develop them. In this regard, Núñez Rojas (2019) points out that these skills include teamwork, mastery of ICTs, critical thinking, and communication.

Limitations

The limitations of this research were the following:

1. A model was not found to theoretically observe the relationships that are included in the proposed model.

2. The willingness of medical and odontologist students to answer the instruments proposed in the study.

3. For the application of the instruments, the help of third parties willing to do so is required.

Delimitations

The delimitations in this investigation are the following:

1. The research was conducted only with medical students from the University of Montemorelos, Nuevo León, Mexico.

2. The studio will debut in the 2022-2023 school year.

3. The instrument will be applied only to students who attend the day assigned to apply the instruments.

Assumptions

The assumptions proposed in this research are presented below.

1. Respondents were willing to answer the questionnaire honestly and truthfully.

2. The literature review will be done according to the specialists in the field in the variables considered in the study.

3. In the review of the theory, scientific literature contained in the databases will be used.

Philosophical Background

This philosophical framework is based on the Holy Scriptures and the writings of Ellen G. White.

Information literacy

Information literacy is the ability to think critically and give an opinion about a text. In other words, it is putting our mind to mindson. The Bible refers to this matter. Isaiah 1:18 says, “Come now, and let us reason,” says the Lord, “though your sins be as scarlet, they shall be white as snow; even if they are red like crimson, like (white) wool they will remain.” Having a critical mind is being able to read a text and make a judgment. The Apostle Paul, on one of his trips, arrived at a Jewish Synagogue and, according to custom, discussed and analyzed a biblical text. In this regard, he said the following:

> After passing through Amphipolis and Apollonia, they arrived at Thessalonica, where there was a Jewish synagogue. And Paul, according to his custom, went

> to them and for three Sabbaths discussed with them (on the basis of) the Scriptures, explaining and presenting evidence that it was necessary for the Christ to suffer and rise from the dead, and (saying:) This Jesus, whom I announce to you, is the Christ. (Acts 17:1-3)

Following the previous thought, 1 Corinthians 13:11 says, “When I was a child, I spoke as a child, I thought as a child, I reasoned as a child; (but) when I became a man, I gave up childish things.” Pablo is correct; as an adult, he is expected to have a more critical mind and use reasoning.

Also, the prophet Isaiah refers to the following:

> For my thoughts are not yours, nor are your ways my ways, declares the Lord. For (as) the heavens are higher than the earth, so my ways are higher than your ways, and my thoughts higher than your thoughts. (Isaiah 55:8-9)

One of the classic statements from the writings of Ellen White that refers to this matter is the following: “The work of true education is to develop this faculty, to educate the youth to be thinkers, and not mere reflectors of other men's thoughts” (White, 2009, p. 15).

Attitude Towards Research

Human beings have the privilege of using research to discover the secrets that God has left in his word. Paul also wrote: “But God has given us the revelation of these things through his Spirit, for the Spirit searches all things, even the deep things of God” (1 Corinthians 2:10). It appears that under the influence possibly of his parents, Solomon thought highly of research, declaring that it is “Rule and power are his; he makes peace in his high places” (Proverbs 25:2). Likewise, Solomon conducted his investigation, declaring: " I gave my mind to knowledge and to searching for wisdom and the

reason of things, and to the discovery that sin is foolish, and that to be foolish is to be without one's senses" (Ecclesiastes 7:25).

To think that the prophets did not require the rigor of the investigation is not valid; they also had to investigate. The apostle Peter says, “For the prophets who gave the news of the grace which would come to you, searched with all care for knowledge of this salvation” (1 Peter 1:10). In the Bible, some texts are recorded that refer to the use and activity towards research. Ecclesiastes 7:25 says, “I set my heart to know, to investigate, and to seek wisdom and reason, and to recognize the wickedness of folly and the necessity of folly.” Also, Deuteronomy 13:14 states, “Then you will inquire, you will seek and ask diligently. And if it is true {and} it proves that such an abomination has been done in your midst”.

One of the clear examples of the attitude towards research was the case of the prophet Daniel when he received a vision that said: “Until 2300 evenings and mornings; then the sanctuary shall be cleansed” (Daniel 8:14). The prophet was frightened, but he did not remain silent, on the contrary, he began to investigate and analyze historical documents, such as the book of Jeremiah,

> In the first year of his rule, I, Daniel, saw clearly from the books the number of years given by the word of the Lord to the prophet Jeremiah, in which the making waste of Jerusalem was to be complete, that is, seventy years. (Daniel 9:2).

In this regard, White (2009) points out the following:

> Instead of closing their minds to what men have said or written, students must be directed to the sources of truth, to the vast fields open to investigation in nature and revelation. (p. 17)

Research Competencies

Competences have been cataloged, such as a person's skills in a particular activity. The Bible makes references to characters or events showing abilities in different areas. On abilities, Exodus 35:10 points out, "And let every wise-hearted man among you come and make whatever has been ordered by the Lord." When the construction of the temple was carried out, competent men with skills were required, 1 Chronicles 22:15-16

> And you have a significant number of workmen, cutters and workers of stone and wood, and experts in every sort of work, in gold and silver and brass and iron more than may be numbered. Up! then, and to work; and may the Lord be with you.

The skills required had to be diverse, as 2 Chronicles 2:7 shows, which relates:

> So now send me an expert worker in gold and silver and brass and iron? In purple and red and blue, and in the cutting of all sorts of ornament, to be with the expert workmen who are here in Judah and in Jerusalem, whom my father David got together.

Also, 1 Chronicles 22:2 says: "And David gave orders to get together all the men from strange lands who were in the land of Israel; and he put stone-cutters to work, cutting stones for building the house of God." 2 Chronicles 2:2 refers to the following: "And Solomon had seventy thousand men numbered for transport, and eighty thousand for cutting stone in the mountains, and three thousand, six hundred as overseers."

Not only the men showed skills, but also the women. Exodus 35:25 points out the following: "And all the women who were expert with their hands made cloth, and gave the work of their hands, blue and purple and red and the best linen." Therefore, God requires his children to have different competencies for his service. Because the Lord has set an example.

The best model of competencies is that of Christ; when he was on earth, he showed the ability to do, Matthew 9:28 corroborates it, saying: “And when he had come into the house, the blind men came to him; and Jesus said to them, Have you faith that I can do this? They said to him, yes, Lord”.

Christ also could keep everything that his father asked of him. Saint John 6:37 says, “Whatever the father gives to me will come to me, and I will not send away anyone who comes to me.”

While on earth, Christ identified himself as a kind person, often displaying the ability to give. The apostle Paul in 2 Corinthians 9:7 points out, “Let every man do after the purpose of his heart; not giving with grief, or by force: for God takes pleasure in a ready giver.”

CHAPTER II

LITERATURE REVIEW

Introduction

This research aims to determine the degree of prediction of information literacy and the attitude toward research on investigative skills in medical students at the University of Montemorelos, Nuevo León, Mexico.

This chapter makes a theoretical review of the constructs under study: information literacy, attitude toward research, and research skills.

Information Skills

Concept

Regarding the concept of information skills, some authors (Julien & Barker, 2009; Naik & Padmini, 2014; Webber, 2010) comment that it is the ability that students have to collect information that already exists, organize it, use it, filter it and evaluate it. In addition, they can use the information obtained effectively, efficiently, and ethically.

Silva and Farias (2019) comment that information skills are skills that the student and the teacher must manage effectively, such as data management, presentations, information search, knowledge of sources or databases, and managing all the information they require for the academic area. Although Prytherch (2000) says that it

is when you have the skills to organize data understandably and can communicate a clear and precise message.

In the words of Bruce (2003), information skills are described as the action that allows one to separate, access, evaluate, organize, and use the information and, through that, make decisions about some information.

Importance

Jewell, et al. (2019) say that "information skills are essential in business contexts where information is abundant and selecting, synthesizing and harnessing that information in decision making provides competence advantage" (p. 1).

Information skills are a series of interrelated skills or competencies required for success in the educational environment (List, 2019). Information literacy of teachers is considered to have become an unavoidable necessity that serves to promote development and quality education (Gu, 2020).

Peres, et al. (2015) point out that teachers should ensure that students have the information skills that allow them to have the necessary knowledge and face academic tasks. For his part, Sánchez Díaz (2012) says that it is essential that students acquire the necessary knowledge, skills, and attitudes that society generally demands; among these competencies, they include informational competencies, which will allow the student to face the reality of this demanding world. As Marzal, Solana, et al. (2011) point out, information skills are a crucial factor in increasing the effectiveness of the teaching-learning process and for training to be effective, therefore, the training of these competencies.

Sturges and Gastinger (2012) mention that information literacy is a fundamental human right, so it is necessary to develop an information literacy program for all students to have better academic development.

Dimensions

It is a study carried out by Girarte Guillén and Valle López (2020), they propose the following dimensions of information skills:

1. The need for information: the user can recognize the need for information and determine the nature thereof.

2. Searching and retrieving information: the user can access information with efficacy and efficiency when using tools or methods to obtain it.

3. Evaluating sources: the user can evaluate information and its sources critically and knows how to incorporate the selected information into his/her knowledge base.

4. Use of the information: the user can use the information sensibly and recognize problems and cultural, ethical, legal, and social aspects implied.

Fujii (2007) validated an instrument to evaluate the information literacy level of a group of students. The following dimensions were found in the study: (a) interest and motivation, (b) fundamental operational ability, (c) information gathering ability, (d) mathematical thinking ability, (e) information control ability, (f) applied operation ability, (g) attitude, and (h) knowledge and understanding.

In another study, Fernández Lafargue (2014) studied information skills. In the design and validation of the instrument, two dimensions were obtained, which are the following: (a) knowledge and skills and (b) attitudes.

Gómez-Garcia, et al. (2021) designed a research work where they validated an instrument by taking a sample of 259 university students. The results of the validation determined three dimensions of information skills. The dimensions were evaluation, sources, and processing and elaboration.

Need for Information

When talking about information needs, it refers to the lack of knowledge about a specific phenomenon, and the phenomena consist of three phases: the emergence of needs, informative behavior, and satisfaction of needs.

Rodriguez Diaz, et al. (2016) points out that "the need for information is a topic of great interest since, thanks to it, the mind is investigated, known, and fed, especially when it comes to delving into any area of life" (p. 96). For his part, Calva González (2009) comments that the information needs are a balancing element between the external environment based on the lack of knowledge and information about some phenomenon.

According to Romanos de Tiratel (2000), one of the tasks of needs studies and the search for information is to produce knowledge that helps people and institutions use the information and design practical information systems for their utility. The need for information is considered to be a recognition that their knowledge is inadequate to satisfy a goal the person has (Ormandy, 2011).

Information Search and Retrieval

Bordignon and Tolosa (2007) comment that “information retrieval is not a new

area but has been developing since the end of the 1950s. However, it currently acquires a more important role, due to the value of information" (p. 14). For their part, Lucky, et al. (2013) say that information retrieval is the device that helps the user adapt to a set of information sources so that only relevant documents retrieve from them.

Okore, et al. (2015) mention the following information search strategies: (a) create a list of keywords from your topic, (b) choose the correct database, search engine, or online journals, (c) construct a search query, and (d) define your search.

Cruz-Gil (2014) points out that the term information recovery must be placed in a disciplinary framework and in the entire documentary process that begins with the search and ends with the satisfaction of the need for information of the person who occupies it. On this same idea, Parada (2015) says that information professionals have the challenge of developing their information skills in the face of the migration of printed collections to digital libraries and taking advantage of the advantages offered by new technologies in information retrieval (Stop, 2015).

Cuba Rodríguez (2018) comments that "the development of computing and information and communication technologies have fostered growth and access to information, as well as conceiving and carrying out the search and recovery of information on the Internet" (p. 146).

Evaluation of Sources

According to Purdue University (2022), significant sources of evidence recognize whether the information they read and include in their research is credible. Despite the vast amount of information available, not all are valid, useful, or accurate.

Evaluating sources of information that could be included in your writing is an essential step in any research process.

Although the evaluation of sources is quite a difficult job, it has to be done if you want your audience to trust what you say; your sources need to be reliable. This will help show your readers that they can trust you to use the best, more reliable information (Ballenger, 2011).

When the source of information is evaluated, it can bring benefits. When an evaluative process of a basis is carried out analytically, it is considered a more complete evaluation of the source, although the drawback is that the process is relatively slow (Elmwood, 2020). Hinchliffe, et al. (2018) suggest that there is an urgent need to instruct students in the evaluation of accessible web sources since students consider Google to be a good tool for conducting research.

Healey Library (2022) de la University of Massachusetts Boston It is essential to evaluate the sources for the following reasons: (a) To find the most relevant information for your topic and assignment, (b) to ensure the quality and reliability of your research, (c) to find expert views, opinions, and research on your topic, (d) to weed out unreliable, biased, outdated, and/or incorrect information, and (e) to make sure you get the information your professor is seeking.

One of the most used sources is Wikipedia and a magazine article, Hjørland (2012) 12 different approaches for the evaluation of information sources, which are the following: (a) the checklist approach; (b) classical peer review; (c) modified peer review; (d) evaluation based on examining the coverage of controversial views; (e) evidence-based evaluation; (f) comparative studies; (g) author credentials; (h) publisher

reputation; (i) journal impact factor; (j) sponsoring: tracing the influence of economic, political, and ideological interests; (k) book reviews and book reviewing; and (l) broader criteria.

Treatment and Organisation

According to Martínez Moriel (2022), the best guarantee in data processing consists in using anonymization techniques, that is, dissociating the content of the information from the distinctive features that identify the owner of the data. For his part, Castillo Blasco (2022) points out that professional activity currently requires much more information than in the past. Therefore, it needs a constant updating of knowledge, which is increasingly complicated due to many jobs requiring an organization for better use.

Palacios Gómez (2016) says that in the area of science and technology, high-quality and up-to-date information on organizations, researchers, projects, and products is required, and the growth in the use of the Internet in research provided more information on these aspects; but, the volume of data made it difficult to process and organize them in a helpful way to understand them and make informed decisions, so it is necessary to organize them and give them adequate treatment.

The same author (2016) says that.

> In the organization of information, the publication of dissemination articles predominates. However, it should be considered that the articles with the most visibility and impact correspond to the disclosure section. The areas where the published articles are concentrated are social sciences, human and behavioral sciences, and exact and applied sciences. The articles with the highest visibility and impact focus on the same disciplines. (p.198)

Use of information and Communication

According to Cobo Romaní (2009), information and communication technologies are the grouping of goods and services due to the use of various devices and computer systems linked to the function of storage, transformation, or exchange of information.

Molina Gómez, et al. (2015) "recognizes in the human being the need to search, to know, to obtain information created, expressed and transmitted by others" (p. 481). Information and communication technologies can contribute to universal access to education, equality, the exercise of quality teaching and learning, facilitating expanding information, improving quality, and guaranteeing integration (United Nations for Education, Science, and Culture, 2015). Albin (2006) considers the rapid advance of information and communication technologies one of the critical factors of chan in humanity.

Information Skills and Curriculum

Dawson and Kallenberger (2007) state that many students need more knowledge of information processes. However, when self-sufficiency is encouraged in students, information processing is beneficial to their learning. This allows you to be insightful with information in all formats and sources. The responsibility for integrating information skills into the curriculum rests with the entire school.

Similarly, Smith (2003) states that when student training is integrated into the curriculum, it provides an optimal approach in planning and implementation to help students develop general and specific information skills in any of the disciplines you must fulfill.

Smith (2003) comments that integrating the curriculum serves as a model for combining general information literacy skills with subject or discipline-specific information literacy.

In this order of ideas, the teaching and learning of information skills can be helpful to achieve competence, as embodied in the study plan. Equipping students with information skills will improve the chances of developing individuals as more competent professionals, thus having what is proposed in the curriculum (Yousaf & Akhter, 2018).

Attitudes Towards Research

Concept

For Chara-Saavedra and Olortegui-Luna (2018), the research attitude is the predisposition referred by the student, coming from their internal psychological state, with an affective charge that can be for or against the investigation.

The attitude toward research influences people's behavior, then three perspectives are governed according to the convictions and conditions of the person, relating to their values and behaviors (Guerrero Pantoja, 2015). For their part, Arellano-Sacramento, et al. (2019) say that the attitude towards research is transformed into actions aimed appropriating and increasing of skills and knowledge to successfully develop productive activities concerning scientific research. In the words of Rojas Betancourt, et al. (2012), the attitude toward research is the positive predisposition of the university student that facilitates the proper learning of research processes.

Valverde Caro (2005) considers the research attitude is that unique position that allows one to act and/or participate in research according to one's capabilities, expertise, characteristics, and skills.

Importance

Attitude is an essential element in the study of research. In this regard, Kakupa (2019) suggests that students must improve positive attitudes toward research to eliminate anxiety or fear of research.

When a student has a negative attitude toward research, this attitude can influence the time, the effort they make, and the commitment to the course (Papanastasiou, 2005). Other authors (Korkmaz, et al., 2010; Russel, et al., 2007; Papanastasiou, 2014) point out the importance of having a positive attitude towards research or statistics, otherwise, if they show a negative attitude, students show a high level of anxiety and stress.

Currently, it is of great importance to conduct research. Although not all students see it as necessary for their professional and personal development (Bolín, et al., 2012).

Dimensions

Affective

According to Foster Marín and Rojas-Barahona (2008), affective attitudes are events and happenings that occur in the minds of men and are reflected through behavior. Then it can be said that the affective component is constituted by the dynamic affective field.

On this same idea, Vargas Cordero (2009) says that when we talk about affective attitude, it conditions the activity of the individual, then between thought and action, the affective always interposes, moderating the acts, being the behavior prepared by affectivity. For his part, Neisser (2014) states that the affective attitude stimulates everything that is done in life, mainly so that the student has meaningful learning.

Amorós (2007) comments that the affective component occurs in three main stages that the student must take into account in their emotional development; these stages are the following: perception, motivation, and satisfaction of their academic development. According to Vargas (2009), affective attitudes are formed by every person.

Cognitive

According to Quiñones Contreras (2018), cognitive attitude is the set of data and information that the subject knows about the object from which he takes his attitude. For their part, Kwon and Vogt (2010) say that the cognitive components help form positive or negative attitudes in the student.

According to Eagly and Chaiken (2007), Maio and Haddock (2010), and Montané, et al. (2007), cognitive contents influence and depend on the affective and behavioral components of behavioral habits and skills.

Behavioral

According to Ríos Patiño (2004), the behavioral component is the spark that ignites interest and allows the red reduction of the complexity of a significant problem.

On the other hand, De las Salas, et al. (2014) say that behavioral attitude refers to behavioral or action intentions with an attitude that can be seen, measured, quantified, and recorded. The person tends to act a certain way towards someone or something. Ibáñez Salgado (2011) states that the behavioral component is related to the predispositions one has to work in the face of circumstances. With this same idea, Bohorquez Ordoñez (2015) and Oyarce Villanueva (2015) point out that behavioral attitude, refers to the willingness to respond to any circumstance.

Attitude Towards Research and Curriculum

Rojas Betancur, et al. (2012) comment that the variable attitude toward research depends on the conditions of the educational process and according to the curriculum and the characteristics of the university. On the other hand, Restrepo Gómez (2012) says that the attitude toward research training is related to many concurrent aspects, such as curriculum, teaching quality, research culture, and institutional policy. In addition, the attitude towards scientific research is a subject that is considered an indicator of the quality of education since ranalysisconstitutes an element of the transversality of the program (Papanastasiou, 2005). Therefore, students' attitudes toward research depend on attitudes toward the teacher, the classroom, and/or the subject's content (Kind, et al., 2007).

Competence for Research

Concept

Castillo-Martínez and Ramírez-Montoya (2021) they say that.

> Research skills today must be developed in such a way that students in higher education will be enabled to make them their own for good. This type of

> competency is given fundamentally in the aspects of the methodological domain, information gathering, and the management of document-writing norms and technological tools. (p. 2)

According to Cabrera Samper (2008), investigative skills are those that help in the construction of scientific knowledge to pose a research problem. For its part, Potolea (2013) states that investigative skills are a set of skills that include cognitive, personal, and instrumental skills. In the words of Gayol, et al. (2008), research skills are the engine of scientific thought. They are abilities to critically manage the bibliography, select and define the research problem, and design a validation process.

Importance

Napoles, et al. (2007) say that it is necessary to develop research skills so that students acquire skills to carry out dynamic and continuous processes in their work area. Continuing with the previous idea, Rodriguez Lopez et al. (2019) and Tuononen, et al. (2019) point out that academic skills (critical thinking, collaboration, communication, and problem-solving) are essential to acquire in higher education.

According to Tuononen, et al. (2019), research skills are necessary throughout the study because they are critical learning outcomes. In their research Keneley & Jackling, 2011; Monteiro, et al. (2016) comment that students must develop various academic skills during their studies because many skills are developed at university.

Students must acquire skills because academic skills are closely related to student learning processes in different areas of study, including research (Nelson Laird, et al., 2014).

Dimensions

Methodological

Campos Morán (2010) comments that to talk about a competency-based methodology, it is necessary to have teachers who have these competencies so that students can imitate the teacher.

The teaching methodology of a competency-based program consists of monitoring throughout the entire process, which allows for obtaining information about how it is being carried out (Cepeda Dovala, 2004). For their part, Harris and Muijs (2005) point out that the methodology refers to the teaching and learning processes that put the student concerning the skills and knowledge within the curriculum.

The methodology for evaluating competencies is presented as an alternative to virtual learning environments. However, it can also be used without technological support (Cardona Torres, et al., 2018).

Generic

Tuononen, et al. (2017) say that academic competencies are essential in all disciplines and may require generic competencies. As these authors point out (Strijbos, et al., 2015; Suleman, 2018), generic skills are called generic skills, essential skills, transferable skills, employability skills, and primary and special skills.

Corominas Rovira (2001) comments that academic preparation encompasses training in specific competencies of the profession and training in generic competencies common to many professions (for example, information management and adaptation to changes, among others).

Campos Saborío (2003) points out that to formulate a set of generic research competencies, a researcher profile can serve as an objective image for the training of researchers.

In the competency-based model, research skills should be one of the generic competencies that each student starting an educational project should develop (Beneitone, et al., 2007). Because the student, during his academic training process, must carry out an investigation, which contributes to the achievement of significant learning to be professionally prepared (Villordo Saucedo, 2004).

Research Competencies and Curriculum

According to Marrero Sánchez and Pérez Zulueta (2013), to acquire research skills, students must obtain the necessary research tools and knowledge. This means that the curriculum must be systematically designed as an integrated, interdisciplinary, and cross-curricular curriculum based on the content of the academic disciplines.

Pérez Zulueta (2013) states that

> At present, great importance is given to training in the academic field. It is necessary to implement processes to complement students' knowledge according to the characteristics and demands of the curricular design in educational institutions. (p. 6)

On this same idea, the United Nations Educational, Scientific and Cultural Organization (2009) states that a platform of learning and research opportunities that satisfy individual aspirations and the social fabric must be built. They must be trained in skills and learn by researching, thinking, and reasoning to appropriate new knowledge.

For his part, Tobón (2006) points out that emphasis should be placed on forming skills and attitudes so that students learn to process and manage knowledge because this process intersects with learning and research.

Reyes, et al. (2010) declare that a university student who starts research has a cognitive development that corresponds to formal thought but needs to gain the knowledge, methods, and research techniques of an experienced scientist. However, if he has them when he acquires investigative competenciess declared in the curriculum, transversal and voluntary.

Research Between Variables

Research Competences

De Las Salas and Martínez (2011) developed a study describing university teachers' technical skills in research. It was a descriptive study with a non-experimental, field, and cross-sectional design. The population consisted of 224 teachers. It was found that teachers, regarding the knowledge dimension, state that they have to reinforce the update (33.7%), they have weaknesses in the experience in the area, in the dissemination and coordination of projects (50%). As for skills, these are high in research planning but with weaknesses in statistical aspects and the construction of measurement instruments.

Campos Céspedes, et al. (2012) carried out a descriptive exploratory study whose purpose was to find out how the teaching staff of an institution evaluate themselves concerning their mastery of research skills. The participants are self-assessed with weaknesses in most of the competencies included in the instrument. Of the three points that represent the high level of mastery, the average that was expressed by the

academics is 1.2 in terms of the use of tools for detecting plagiarism, 1.5 for skills related to the use of basic programs to analyze data, and 1.7 in terms of the use of a bibliographic manager.

Nagamine Miyashiro (2015) carried out a research study on factors for the achievement of investigative competences in a private university, with a quantitative approach, with the objective of determining if the processes of reading comprehension, the strategies and abilities for learning and the teaching skills, affect the research skills of students with a population of 422 students. The results showed that the three proposed variables significantly affect the achievement of investigative skills (β = 2945, p = .000; β = -1998, p = .136; β = -2347, p = .005).

Attitudes Toward Scientific Research

Hussain, et al. (2016) conducted a study where students' attitude toward research was explored. The study participants were Master of Technology Education (MTE) students. The sample consisted of 140 technology education students selected through the random sampling technique. The scale consisted of 28 items that were divided into five factors. It was found that students have a positive attitude toward research. Also, no significant difference was found between male and female students' attitudes toward research (M = 3.5, p = 612).

Khan, et al. (2018) sought to know the attitudes toward research in university professors. A stratified demonstration was produced with a sample of 240 teachers. It was found that university professors showed positive attitudes towards research with an arithmetic mean of 4.0 (scale from 1 to 5).

For his part, Al-Arifi (2019) also analyzed attitudes toward scientific research in pharmacy students. The sample consisted of 223 participants. A questionnaire containing 14 criteria was obtained. The results showed that 66.3% of the students agreed that participating in research would increase their interest in pursuing a career related to scientific research. 75.3% were interested in participating in the study during their academic training, 73.6% noted that research training should be a mandatory part of teaching plans, and 50% of students were interested in pursuing postgraduate studies.

Khalaf, et al. (2019) investigate attitudes and barriers to conducting research among primary care physicians. The sample was 200 physicians from primary care centers in Bahrain. Most physicians surveyed showed a positive attitude toward conducting research, with an arithmetic mean of 4.47 (on a scale of 1 to 5, higher scores indicated more positive attitudes). 76.5% expressed a lack of time to conduct research, 63% lack financial support, and 50% lack statistical support.

Information Skills

Rosales Mandujano (2018) investigated to evaluate the informative skills presented by the students of the fifth semester of the Mariano Escobedo General University of the Information Technology career; 17 students participated in the investigation. The results made it possible to identify the informational skills that students who are about to graduate have and the skills that need to be strengthened for the proper use of information. Students need to gain the skills to find, evaluate, use, and communicate information adequately. 45.5% of students can find info, 44.7 can evaluate sources of

information, 32% can organize information, 47% can use data, and 54% can communicate information.

Parrales Navas (2020) sought to determine the relationship between informational skills and managerial communication in teachers. The survey technique was extracted, and the questionnaire was used to collect information from the 62 teachers. Regarding the information skills variable, 74.20% of the teachers stated that they maintained a high level of information skills, and the remaining 25.80% had a medium level of information skills, resulting in no teacher saying that they kept a low level of informational skills. Regarding the information search dimension of the information skills variable, 67.74 teachers expressed a high level, and the remaining 32.26% was medium. In addition, a low relationship was found between information skills and managerial communication in teachers (r = 0.389, p = .002).

Barriga Ramirez, et al. (2014) investigated the object of characterizing competencies of the academic community. 52 surveys will be applied to teachers/researchers, 62 surveys to students, and four surveys among librarians. It was found that students express that they identify information through author, title, and subject fields (25%), but the lowest value is to locate information using Boolean operators (10%). On the other hand, librarians do identify information using boo-lean operators (19%). According to the answers expressed by teachers/researchers and librarians on how to promote informational skills in students, the highest value is recorded in the lecture modality (26% and 30%, respectively); followed by workshops of an optional nature and of a preparatory nature for new students (23%, and 20%, respectively); as well as individualized training in third place (16% and 10%, respectively).

Model Justification

Information Literacy Predict on the Research Competency

Adeleke and Emeahara (2016) developed a study to search for the relationship between information literacy and the use of electronic information resources by post-graduate students of a University. The sample consisted of 333 graduate students out of the 2,623 that made up the population. The results show a significant relationship between information literacy skills and the use of electronic information resources (r = 122, p = 034).

Nwosu, et al. (2015) implemented a study to find the relationship between the information literacy skills of the academic staff of a University and the results of the investigations. The sample was 150 academics from an educational institution. A positive low significant relationship was found between the level of information literacy skills scores and teacher inquiry outcome (r = 0.23, p = 000).

Anekwe (2018) conducted a study on the impact of web-based information literacy skills on research productivity among academic staff at Nigerian universities. The sample was 337 academics. The independent variable, information literacy skills, significantly predicted the dependent variable, research competence (β = 0.69; t = 17.459; p <.05).

Information Literacy Predicts on Attitude Towards Research

Oladejo and Oyewole (2020) developed a study on the attitude towards plagiarism of students from three theological institutions in Nigeria. The population consisted of 1472 undergraduate and graduate students. The two-stage random sampling technique was used to determine a sample size of 355. The results showed a significant

negative relationship between literacy and students' attitudes toward plagiarism (r = -.156; df = 299, p < 0.05).

Adekunle et al. (2019) they determined whether students' attitudes and perceptions of the information literacy program determine their influence on students' information literacy skills. The perception was found not to be a significant predictor (β =0.009, t (507) =0.202, p > .05). It is also shown that attitude is a strong predictor of information literacy (β = 0.359, t (507) = 7.841, p < 0.05).

Dortaj, et al. (2021) investigated the purpose of knowledge as a predictor of attitudes. The population was 473 (366 students and 107 teachers) was selected by stratified random sampling. It was found that the literacy variable positively and significantly predicted the attitude of students and teachers (p < .01, β=0.81).

Attitude Predicts on Research Competencies

Paico Ruiz (2021) sought to determine the existence of a relationship between the attitude toward scientific research and investigative skills in graduate students at universities in Lima, 2020. It was a multiple quantitative and correlational research. There was a non-probabilistic demonstration with 371 participants. A direct and significant moderate consequence (Rho = .559, p < .001) was found between the attitude towards scientific research and investigative skills.

Bohórquez Ordoñez (2015) analyzes the relationship between the scientific attitude and the achievement of competencies in the research course in a group of students. The sample consisted of 237 students. For the hypothesis test, Pearson's r was used at a significance level of 0.05. The results show a direct, moderate, and significant

relationship between the scientific attitude and the level of competence achievement (r = .600, *p* = .000).

In a study, Oyarce (2015) sought to know the self-perception of skills and attitudes to carry out scientific research in a sample of 86 master's students. The study was descriptive and correlational, and the examinee was simply random. In the results, a direct relationship was found between the ability to carry out scientific research work and the knowledge about research methodology (*r* = .251), as well as between the attitude to carry out scientific research work and the ability to carry out scientific research work (*r* = .546).

Serrano (2022) sought to determine if attitudes toward research impact the development of research skills among 12th-grade students. The sample was 60 students. This study revealed a significant relationship between how students feel about research and how they develop their research skills throughout the course (*r* = .524, *p* = .000).

CHAPTER III

METHODOLOGY

Introduction

The main purpose of this study is to know if the empirical model, in which the perception of information literacy impacts the perception of the attitude towards research and investigative competences, does it have a goodness of fit of according to the theoretical model in medical students at the University of Montemorelos, Nuevo León, Mexico.

This chapter will explore the description of the methodology used during the investigation and addresses the design of the study, which includes: (a) the type of research, (b) the study population, (c) the sample, (d) the measuring instrument, (e) the null hypotheses, (f) the data collection, and (g) the data analysis.

Type of Investigation

According to Hernández Sampieri, Fernández Collado and Baptista Lucio (2014), the type of research conducted was quantitative, explanatory, cross-sectional and field-based.

It was quantitative, because it used data collection to test hypotheses, considering numerical measurement and statistical analysis. For a study design to be categorized as quantitative empirical research, data are collected and analyzed, which implies that there are observable and measurable data, offering the possibility of

generalizing the results, replicating, and facilitating the comparison of the study.

It was explanatory because it sought to identify causal relationships between the variables.

It was cross-sectional, because data were collected at a single point in time to describe the variables and their interrelationship was analyzed. The instrument was administered at a single point in time.

It was descriptive because it described the demographic variables.

Population

In this study, the population under consideration are students from the 435 students of the medical school and the 100 students of the school of odontology that have followed the research route of the current curricular program of Montemorelos University.

Sample

The type of sampling carried out in this research is non-probabilistic, intentional, and for convenience. A return rate of 400 students (74.7%) is expected, forming a sufficient sample to carry out this study.

The sample for this research is determined by students in their second year (third semester) to fourth year (eighth semester) of their respective careers.

Exclusion criteria: For the purposes of this research, students who are doing a rotating internship (for medical students) and students doing social service (for both careers) are excluded.

Inclusion criteria: Students enrolled in the study programs in medicine and dentistry selected from the second year onwards because this is when they begin the research route according to the curriculum.

Instrument

The instrumentation includes the variables, the measuring instrument, the reliability, and the operationalization of the variables.

Variables

The variables used in this research were the following: (a) exogenous, the perception of information skill, and (b) endogenous, student´s perception of attitude towards research and student´s perceptions of research competencies.

Instrument Development

The instruments used in the present investigation are described below. The instruments used in the present study are shown in Appendix A, and Appendix B is the informed consent.

Information Skill

To measure the perception of information literacy construct, an instrument developed by Girarte Guillén (2020) was used. The instrument is composed of six items with a Likert scale, with five response options. The scale is as follows: 1. *Totally disagree,* 2. *Disagree*, 3. *Neutral*, 4. *Agree*, and 5. *Totally agree*. The instrument has the following two dimensions: (a) information need and (b) search and recovery. The internal consistency analyzed by alfa Cronbach measured .744 for the global survey.

Attitude Toward Research

To measure the perception of Attitude toward research construct, an instrument developed by Girarte Guillén (2020) was used. The instrument is composed of nine items with a Likert scale, with five response options. The scale is as follows: 1. Totally Disagree, 2. Disagree, 3. Neutral, 4. Agree, and 5. Totally Agree. The instrument has the following three dimensions: (a) Affective, (b) Cognitive, and (c) Behavioral. The internal consistency analyzed by Alfa Cronbach measured .811 for the global survey.

Research Competencies

To measure the perception of research competencies construct, an instrument developed by Girarte Guillén (2020) was used. The instrument is composed of six items with a Likert scale, with five response options. The scale is as follows: 1. *Totally Disagree*, 2. *Disagree*, 3. *Neutral*, 4. *Agree*, and 5. *Totally Agree*. The instrument has the following two dimensions: (a) research problem and (b) theoretical framework. The internal consistency analyzed by alfa Cronbach measured .887 for the global survey.

Operationalization of the Variables

Table 1 presents the operationalization of the two main variables of the study. The conceptual, instrumental and operational definitions for each of them are included. In Appendix C is the rest of the variables.

Table 1

Operationalization of the Variables

Variable name	Conceptual definition	Operational definition	Measurement scale
Information Skills	Bruce (2003) information skills are described as the action that allows one to separate, access, evaluate, organize, and use information and through that make decisions about some information. The reliability of the construct reported by the author was α = .744	The information skill level indicators contain the following scale: 1. Strongly disagree 2. Somewhat disagree 3. Indecisive 4. Somewhat agree 5. Totally agree. 1. Printed sources of information are used in the research process (for example, books, ...) 2. I can define the level of content depth that I want to get 3. I know the types of scientific information sources (eg doctoral theses, conference proceedings,...) 4. I know the terminology of the area of knowledge in which I am looking for information 5. I know the most relevant authors in the field of the topic I am researching 6. I am able to recognize the structure of a text	To measure the level of information skills, the average of the six elements was obtained. The variable was considered as a metric. The instrument contains two dimensions: Need for information (items 3, 5 and 6), and search and retrieval (items 1, 2 and 4).

Operationalization of Null Hypotheses

In this, the following null hypothesis was formulated:

The empirical model, in which the self-perception of information literacy impacts the self-perception of the attitude towards research and investigative competences, does not have a goodness of fit of according to the theoretical model in medical students at the University of Montemorelos, Nuevo León, Mexico.

Table 2 shows the operationalization of the null hypothesis. It includes the variables, the level of measurement of each variable, and the type of statistical test that is known**.**

Table 2

Operationalization of Null Hypotheses

Null Hypothesis	Variables	Measure-ment level	Statistical test
The empirical model, in which the self-perception of information literacy impacts the self-perception of the attitude towards research and investigative competences, does not have a goodness of fit of according to the theoretical model in medical students at the University of Montemorelos, Nuevo León, Mexico.	Exogenous: the self-perception of information literacy.	Metrics	For the hypothesis test, structural equation models were used. First, the model is accepted based on the fulfillment of at least three adjustment criteria, chi-squared, relative chi-square, CFI, GFI, and RMSEA. The rejection cri- terion of the null hypothesis was for significance values $p < .05$, in the calculated parameters.
	Mediated: Students´ self-perception of attitude towards research.	Metrics	
	Endogenous: The self-perception of research competencies.	Metrics	

Goodness of Fit Indices

Adjustment indexes for structural models through goodness-of-fit measures, incremental measures of adjustment, and measures of parsimony adjustment were presented by Huerta Wong and Espinoza Montiel (2013) and Reyes Riquelme (2008). They are summarized below.

Absolute Adjustment Measures

The degree to which the model predicts the matrix of initial data is determined by the absolute adjustment measures. The following indicators were selected for the model.

1. Chi-square: corresponds to the best-known index of the maximum method verisimilitude. The model will have a better fit the smaller the value.

2. Chi-square/degrees of freedom: compares models with different degrees of freedom. A quotient of 5 is considered a reasonable adjustment while 2 represents an excellent fit.

3. Goodness of fit index (GFI): this analyses the adjustment in all cases which is in-dependent of the size of the sample and establishes firm deviations from normality. Its value is between 0 (poor adjustment) and 1 (perfect adjustment).

4. Tucker-Lewis Index (TLI): must be equal to or greater than .90.

5. Mean square approximation error (RMSEA): values less than .05 are ideal; however, values less than .10 are also considered favorable. For this investigation, values less than or equal to .08 will be taken as parameters.

Incremental Adjustment Measures

The incremental adjustment measures seek to compare the proposed model with a null model to determine if there is a direct association between the variables. Below are the indicators:

1. Normative index of adjustment (NFI): seeks to compare the incremental adjustment with the null model. Its range is between 0 and 1. An NFI score equal to .9 indicates that the model proposed is 90% superior to the null model.

2. Tucker-Lewis Index (TLI): the assumption made is that the best model is not the one for which the chi-square is equal to zero, but the one for which the value expected from the chi-square, divided by its degrees of freedom is equal to one. The formula follows: TLI = [(chi-square null / zero degrees of freedom) - (chi-square model/ model degrees of freedom)] / [(chi-square null / degrees of freedom null) -1].

3. Index of incremental adjustment (IFI): acts as a relative comparison of the proposed model to the null model. It considers the degrees of freedom becoming less sensitive to the sample size when compared to other measures of incremental adjustment such as NFI. If the model exposed is as bad as the worst possible model, the value presented will be 0; however, if the model is good, it will be 1.

Measures of Adjustment of Parsimony

This measure allows estimating the degree to which adjustment is achieved for each coefficient or estimated parameter. The indicators are presented below for each adjustment:

1. General index of parsimony (PGFI): this index ranges between 0 and 1. High values establish greater goodness of fit and parsimony. Despite this, there are no criteria regarding how high each index should be to establish the best parsimonial adjustment. The measure becomes useful as it allows for the comparison of models.

2. Akaike comparative index (AIC): allows comparison between two models to determine which fits with greater parsimony. While this is the case, neither a scale nor guide criteria are established. Its interpretation lies in investigating the mode with the lower value.

Adjustment Criteria

The below indices were criteria to evaluate the goodness of fit used to test the model. (a) the likelihood ratio of the chi-square ($\chi 2$), as small as possible and its significance level p greater or equal to .05, (b) standardized chi-square (X2/df) less than 3, (c) goodness of fit index (GFI) equal to or greater than .90, (d) goodness of comparison

index (CFI) equal or greater than .90, (e) root of the average quadratic residual (RMSEA) equal to or less than .08, (f) (NFI) greater than or equal to .90, and (g) (TLI) greater than or equal to .90.

Data Collection and Access to Respondents

The data collection was carried out in the following way:

1. Oral and written communication will be used to inform the school dean of the researcher's intent to conduct a survey. In addition, this communication will be to request permission for the researcher to apply the instrument to the students in the school.

2. The instrument will then be distributed to the dean or the designee for the project.

3. The survey will be electronically applied when best suited for them as appointed by the principal or designee.

Ethical Consent

In this work, the privacy of each participant will be respected, and the credits of thoughts of other authors will be admitted with recognition and ownership of their works.

Data Analysis

The collected data were analyzed using some statistical package. The tests used in this investigation were structural equation models. With the database completed, descriptive statistics (measures of central tendency) were used to clean the database and obtain demographic information, and the behavior of the main variables was also evaluated.

CHAPTER IV

ANALYSIS OF THE RESULTS

Introduction

The main objective of this research was to find out if the empirical model, in which the self-perception of informational capacity impacts the self-perception of the attitude towards research and research skills, has goodness of fit according to the theoretical model in medical students and dentistry from the University of Montemorelos, Nuevo León, Mexico.

This chapter will precisely develop the following sections: (a) population and sample, (b) demographic description of the subjects, (c) variable behavior, (d) construct validity, (e) null hypothesis, and (f) summary. of the chapter.

Demographic Description

The following describes the demographic data considered in the study, which includes sex, semester, grade, and career. Appendix D shows the support tables.

Sex

The distribution of the students who answered the instrument by gender is shown below: 56.2% are female (*n* = 168) and 43.8% are male (*n* = 131). It is observed that the majority of the respondents are female.

Semester

Table 3 contains the distribution of the students who answered the instruments for the semester they study. The table shows that the highest frequency of participants are from the sixth semester, which represents 26.4% (*n* = 79).

Table 3

Distribution of Participants by Semester

Semester	*n*	*%*
10	46	15.4
2	52	17.4
4	69	23.1
6	79	26.4
8	53	17.7
Total	299	100.0

Grade

Table 4 contains the distribution of the students who answered the instruments according to the degree of study they are studying. The table shows that the highest frequency of participants is from the third, which represents 26.4% (*n* = 79).

Table 4

Distribution of Participants by Grade

Grade	*n*	*%*
First	52	17.4
Second	69	23.1
Third	79	26.4
Fourth	53	17.7
Fifth	46	15.4
Total	299	100.0

Career

The distribution of the students who answered the instrument by the career they study is shown below: 66.2% are from medicine (n=198) and 33.8% from dentistry (n= 1101). It is observed that most of the respondents study medicine.

Age

Table 5 contains the distribution of the students who answered the instruments according to age. The table shows that the highest frequency with respect to age is 20 years, which represents 22.1% (*n* = 66).

Table 5

Distribution of Participants by Age

Age	*n*	*%*
17	7	2.3
18	31	10.4
19	50	16.7
20	66	22.1
21	50	16.7
22	37	12.4
23	27	9.0
24	12	4.0
25	5	1.7
26	5	1.7
27	3	1.0
28	3	1.0
30	1	.3
47	1	.3
57	1	.3
Total	299	100.0

Hypothesis Testing

The hypothesis that was raised in the present investigation is the following: The empirical model, in which the self-perception of information literacy impacts the self-perception of the attitude towards research and investigative competences, does not have a goodness of fit of according to the theoretical model in medical students at the University of Montemorelos, Nuevo Leon, Mexico. In Appendix E are the support tables.

To calculate the parameters of the studied model, the maximum likelihood estimation process (MLE) was used (see Figure 2). According to the calculated model, the following values were obtained according to the indices used: CMINDF = 3.49, CMIN = 4.49, p = .061, RMESA , .08, AGFI = .94, GFI = .99, GFI = 97, TLI = .97, NFI = .99, CFI = .99 and RMR = .00).

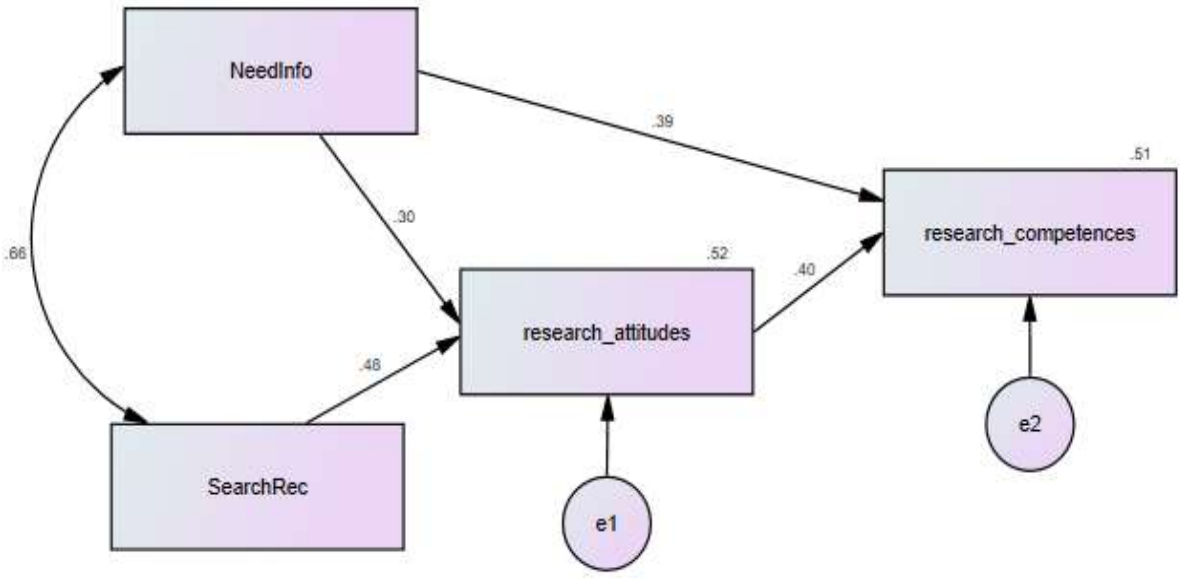
According to the adjusted model (see Figure 6), the p-indices of the chi square, RMESA, AGFI, GFI, GFI, TLI, NFI, CFI, and RMR) contain very acceptable values. Of the fit indices that were used, the CMINDF did not reach the required value. Therefore, with the nine goodness-of-fit indices obtained, it is concluded that the proposed theoretical model fits adequately with the data collected through the instruments, that is, the resulting empirical model.

Once the model is accepted, it is observed that the exogenous latent variable of self-perception of information literacy (γ = .30) is a direct predictor of the attitude towards research. The need for research information and registration is a direct predictor of the attitude towards research (γ = .48). The attitude towards research is a direct

predictor of investigative competences (γ = .40), and the self-perception of information literacy is a direct predictor of investigative competences (γ = .39).

Figure 2

Path Analysis of Investigative Competences



x2 = 3.496, p = .061, x2/gl = 3.496, RMSEA = .089,
AGFI = .945, GFI = .995, TLI = .976, NFI = .995, CFI = .996, RMR=.009

The self-perception of information literacy is not a significant indirect predictor of research competences, with research attitudes as a mediating variable (γ = .12).

The need for research information and registration is not an indirect predictor of the research competences, with research attitudes a mediating variable (γ = .19). With the analyzes carried out previously, there is sufficient evidence to accept the research hypothesis.

Other Analyzes

A significant difference (p = .009) was found between the affective dimension with respect to the career they study. The arithmetic mean of the medical students was 3.60 and that of dentistry was 3.84. Dental students show a better level of affectivity. The behavior dimension made a significant difference (p = .045) with the career they study. The arithmetic mean of the medical students was 4.44 and the dental students 4.60. Dental students show a better level in the behavior dimension.

Regarding the dimension of the research problem, there was a significant difference (p = .023) with the major studied. The difference is made by dental students, with an arithmetic mean of 3.59.

Regarding the variable level of attitude towards research, a significant difference is observed (p = .022) with the career studied. The difference is made by dental students, with an arithmetic mean of 4.01.

Regarding the medical school, a significant difference was found between the investigative competencies construct and the semester of study. Those of the eighth semester (M = 3.84) make a significant difference with those of the second semester (p = .018) (M = 3.24) and with those of the sixth semester (p = .003) (M = 3.25) . A significant difference (p = .040) was found between the behavior dimension and gender. Men show a higher level (M = 4.56) than women (M = 4.38). In Appendix E are the support tables.

CHAPTER V

DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This chapter presents the discussion, conclusions, and some recommendations drawn up from the results of this study that sought to find out if the empirical model, in which the self-perception of informational ability impacts on the self-perception of the attitude towards research and competencies research, has goodness of fit according to the theoretical model in medicine and dentistry students of the Autonomous University of Montemorelos, Nuevo León, Mexico.

Discusión

Information Literacy, and Attitude Towards Research

In the present investigation, information literacy was found to be a significant mean predictor of research attitude. This result agrees with Pinto (2010) who points out that for students to become information literate they must have a certain attitude that helps them face these difficulties. In this same sense, Ogunlana et al. (2013) and Adebamigbe (2004) attitude is the most effective factor for the acquisition of skills by students, where attitude is related to information literacy.

Previous studies, such as that of Oladejo and Oyewole (2020), found a significant negative relationship between literacy and student attitudes. In this sense, Adekunle et al. (2019) found that students' attitudes and perceptions about the information literacy program determine its influence on students' information literacy skills. Also Dortaj et al. (2021) found that the literacy variable positively and significantly predicted the attitude of students and teachers.

Information Literacy and Investigative Competence

The study found that information literacy is a significant predictor of research competence. Previous studies present similar results to the present investigation. For example, Adeleke and Emeahara (2016) found a significant relationship between information literacy skills and the use of electronic information resources. In this same sense, Nwosu et al. (2015) also found a positive relationship between the level of information literacy skills scores and teacher research level. It also agrees with Anekwe (2018) who found that the independent variable information literacy skills is a significant predictor of the dependent variable research competence.

In this same sense, the European Commission (2004), research skills are a transferable package of knowledge, skills and attitudes that people need for their training, which includes acquiring a critical mind and knowing how to choose the appropriate information and useful. In addition, Wen and Shih (2008) point out that information literacy is required for the possession of the knowledge, skills and attitudes necessary to collect, analyze, evaluate, organize and synthesize information in an investigation.

For his part, Newto (2005) says that knowledge of information literacy goes hand in hand with knowing when there is a need for information, the resources available, how

to find information, evaluate and share the findings of their investigations and The Commission Middle States College of Higher Education (2003) points out that a student with information literacy skills can ask a research question with breadth and depth. Knows where to look for information and knows the sources of information.

Attitude Towards Research and Research Skills

The study also found that attitude towards research is a good predictor of research skills. Although attitude plays an important role in research, Ruiz Bolívar and Torres Pacheco (2005) comment that it seems to have little impact on the development of investigative skills and the formation of positive attitudes towards scientific research.

On the other hand, Serrano (2022) found a significant relationship between how students feel about research and how they develop their research skills throughout the course. In this order of ideas, Abun (2021) points out that research is not generated in many professions, due to the lack of a good or positive attitude towards research.

For his part, Hofmeister (2007) says that the result of a positive attitude towards research is having skills or knowledge about research. On the other hand, Unver et al. (2018) found a positive correlation between age and a positive attitude towards research. Because the older ones showed a better attitude towards research and acquired more skill and experience. In this order, some authors comment that the negative attitude of students towards research is mainly due to a lack of training or research skills (Al Furaikh, et. al, 2017; Kumari, et al (2018).

Need for Information and Research Registration, and Attitude Towards Research

Finally, in the present the need for information, finalizing the research record, and turning out to be a significant predictor of the study of attitude towards Research. The result of this study is consistent with the results of previous studies. Rojas Betancur et al. (2012) point out that the student's attitude towards science in general and scientific research in particular is related to the student's ability to dynamically develop knowledge and to the fact that they know how to process information correctly.

Some authors agree that the development of a positive attitude of students and teachers towards research is related to critical, analytical training, the development of skills and abilities for training and writing the results (González, et al., 2007; Rojas, 2010, Rojas, et al., 2012). Along the same lines, other researchers (Huamaní, et al., 2008; Hunter, et al., 2007) point out that it is essential to encourage students to have a positive attitude towards scientific research, such as thesis work, because this is a fundamental tool for the creation and development of knowledge and sought results.

In addition, it is considered when students have a positive attitude towards scientific research, they have a behavior towards writing results and producing scientific literature (Riveros et al., 2015; Riveros et al., 2018).

Conclusions

Of the Model

According to the adjusted model, the following conclusions are presented:

1. The proposed theoretical model adequately adjusts to the resulting empirical model.

2. Information literacy was a direct predictor of the attitude towards research.

3. The need for information and recording of the research was a direct predictor of the attitude towards the research.

4. The attitude towards research was a direct predictor of research competences.

5. Information literacy was a direct predictor of research competences.

6. Self-perception of information literacy is not a significant indirect predictor of research competencies, with research attitudes as a mediating variable.

7. The need for research information and registration is not an indirect predictor of research skills, with research attitudes being a mediating variable.

Recommendations

Based on the results obtained, the following recommendations are given to the managers of the participating institution.

1. Develop the investigative skills of students in the resolution of information problems, because it affects the attitude towards research.

2. Create intentional workshops on the recording of scientific information, such as writing and data analysis because it impacts the attitude towards research.

3. Develop courses on how to improve the attitude of students towards research, because it allows the creation and strengthening of research skills.

4. Work with students so they know why the information is needed, where they can find it, and how they should evaluate it.

For Future Research

1. Carry out the research considering other variables: the tools available in the institution, the teacher's attitude, the teacher's teaching method, the evaluation system, parental support, cooperative work, among others.

2. Run the model in other audiences to observe the behavior of the variables and compare results.

APPENDIX A

INSTRUMENTS

I. INSTRUCCIONES GENERALES

Se te invita a responder cada declaración seleccionando la opción o la escala que mejor describa tu situación.

II. DATOS DEMOGRÁFICOS

Marque donde corresponda conforme se indique

Género		Masculino	Femenino	
Edad en años				
Año que cursa:		□ Segundo	□ Tercero	□ Cuarto
		□ Quinto	□ Sexto	
	□ Medicina □ Odontología		□ Séptimo	
			□ Octavo	
Carrera:				

III. MODELO DE ASOCIACIÓN

Totalmente en desacuerdo	Algo en de-sacuerdo	Indeciso	Algo de acuerdo	Totalmente de acuerdo
1	2	3	4	5

Declaración	1	2	3	4	5
1. Se utilizar fuentes de información impresa en el proceso de investigación (ej. libros, ...)					
2. Puedo definir el nivel de profundidad del contenido que deseo obtener					
3. Conozco la tipología de las fuentes de información científica (ej. tesis doctorales, actas de congresos, …)					
4. Conozco la terminología del área de conocimiento en la que realizo la búsqueda de información					
5. Conozco los autores más relevantes en el ámbito del tema que investigo					
6. Soy capaz de reconocer la estructuración de un texto					
7. De las cosas que más me agradan son las conversaciones científicas					
8. Considero que tengo la paciencia necesaria para investigar					
9. Las actividades del día a día me inspiran a seguir investigando					
10. La investigación es una de las cosas que me despierta interés					
11. Todos los profesionales deberían aprender a investigar					
12. Para mí, en investigación es importante fortalecer la capacidad de escuchar					
13. En mi opinión, la investigación es relevante para el avance de la ciencia					

14. Por lo regular cumplo lo relacionado con investigación					
15. Estoy al tanto sobre temas de actualidad					
16. Acostumbro a escribir para profundizar en temas de interés					
17. Se cómo poner límites temporales a la investigación					
18. Se cómo poner límites teóricos a la investigación					
19. Identifico las limitaciones externas a la investigación					
20. Conozco los tipos de investigación en cuanto a su alcance (exploratoria, descriptiva, correlacional o explicativa)					
21. Conozco el tipo de investigación experimental					
22. Puedo elegir entre una investigación transversal y una longitudinal					

APPENDIX B

INFORMED PARENTAL CONSENT FORM

Consentimiento Informado

Estimado/a Participante:

Como estudiante doctoral del Posgrado en Educación de la Universidad de Montemorelos, me encuentro realizando una investigación para la tesis titulada “Desarrollo de habilidades informacionales y actitud hacia la investigación para la adquisición de competencias investigativas en estudiantes de carreras de la salud”.

El presente documento tiene como finalidad hacerle conocer algunos detalles del estudio y solicitarle su consentimiento informado para participar en él.
Se te invita a responder cada declaración seleccionando la opción o la escala que mejor describa tu situación.

Su participación en este estudio es de carácter libre y voluntario, pudiendo solicitar ser excluido de esta investigación y que sus intervenciones no sean consideradas en esta investigación sin justificación previa ni perjuicio para usted. Si usted participa en esta investigación lo hace bajo su expreso consentimiento informado y autoriza al aceptar mediante la opción “ACEPTO”. (Para el formato en línea).

La confidencialidad de su identidad será resguardada por las siguientes medidas:

Los instrumentos recogidos son de carácter anónimo y solo el equipo de investigación tendrá acceso a los datos proporcionados en ellas.

En el análisis general de los datos se utilizarán técnicas estadísticas para organizar e interpretar la información que surja. Dadas las características del estudio los datos serán usados solamente en instancias académicas de investigación y aquellas propias de la divulgación investigativa.

En la presentación de resultados se utilizarán nombres ficticios y se reservará todo posible indicio que permita una identificación posible como lugares, instituciones, guardias, etc.

Asimismo, el Investigador Responsable, asume un compromiso de confidencialidad para resguardar la identidad de todos los involucrados en este estudio.

1. Beneficios

Este estudio no tiene beneficios directos para usted. Sin embargo, cabe destacar también que su participación en este estudio tampoco tiene asociado ningún tipo de costo para usted. En tal sentido creemos que la investigación produce más bien

beneficios indirectos en sus participantes puesto que les permitirá reflexionar sobre las habilidades investigativas que tiene, cuál es su actitud hacia la investigación y que competencias en investigación ha adquirido.

2. Compromiso

Por su aceptación los participantes se comprometen a proveer información real en cada instancia que me sea solicitada y responder de acuerdo con mis concepciones, conocimientos y experiencias.

☐ ACEPTO y declaro conocer los términos de este consentimiento informado, los objetivos de la investigación, las formas de participación, de los costos y riesgos implicados, y del acceso a la información y resguardo de información que sea producida en el estudio. Reconozco que la información que provea en el curso de esta investigación es estrictamente confidencial y anónima. Además, ésta será usada solo con fines de difusión científica.

Se agradece tu participación en este estudio.

APPENDIX C

OPERATIONALIZATION OF THE VARIABLES

Variable name	Conceptual definition	Operational definition	Measurement scale
Information Skills	Bruce (2003) information skills are described as the action that allows one to separate, access, evaluate, organize, and use information and through that make decisions about some information. The reliability of the construct reported by the author was α = .744	The information skill level indicators contain the following scale: 1. Strongly disagree 2. Somewhat disagree 3. Indecisive 4. Somewhat agree 5. Totally agree. 1. Printed sources of information are used in the research process (for example, books, ...) 2. I can define the level of content depth that I want to get 3. I know the types of scientific information sources (eg doctoral theses, conference proceedings,...) 4. I know the terminology of the area of knowledge in which I am looking for information 5. I know the most relevant authors in the field of the topic I am researching 6. I am able to recognize the structure of a text	To measure the level of information skills, the average of the six elements was obtained. The variable was considered as a metric. The instrument contains two dimensions: Need for information (items 3, 5 and 6), and search and retrieval (items 1, 2 and 4).
Investigative Attitudes	Chara-Saavedra and Olorteguí-Luna (2018), the research attitude is the predisposition referred by the student, coming from their internal psychological state, with an affective charge that can be for or against the investigation.	The indicators of the level of investigative attitudes contain the following scale: 1. Strongly disagree 2. Somewhat disagree 3. Indecisive 4. Somewhat agree 5. Totally agree 7. Of the things that I like the most are scientific conversations 8. I consider that I have the necessary patience to investigate	To measure the level of investigative attitudes, the average of the six elements was obtained. The variable was considered as a metric. The instrument contains three dimensions: Cognitive (Items 7, 8, 9 and 10), behavioral (Items 11, 12 and 13) and affective

	The reliability of the construct reported by the author was α = .811	9. Day-to-day activities inspire me to continue investigating 10. Research is one of the things that arouses my interest 11. All professionals must learn to investigate 12. For me, in research it is important to strengthen the ability to listen 13. In my opinion, research is relevant to the advancement of science 14. I usually do what is related to the investigation 15. I am up to date on current affairs 16. I usually write to delve into topics of interest	(Items 14, 15 and 16).
Research Competences	Potolea (2013) states that investigative skills are a set of skills, which include cognitive, personal and instrumental skills The reliability of the construct reported by the author was α = .887	The indicators of the level of investigative competences contain the following scale: 1. Strongly disagree 2. Somewhat disagree 3. Indecisive 4. Somewhat agree 5. Totally agree 17. I know how to put time limits on the investigation 18. I know how to set theoretical limits to research 19. I identify external limitations to the research 20. I know the types of research in terms of its scope (exploratory, descriptive, correlational or explanatory) 21. I know the type of experimental research 22. I can choose between a cross-sectional and a longitudinal investigation.	To measure the level of investigative skills, the average of the six articles was obtained. The variable was considered as a metric. The instrument contains three dimensions: Research problem (items 17, 18 and 19), and methodological framework (items 20, 21 and 22).

APPENDIX D

DEMOGRAPHIC DATA

```
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  /ORDER=ANALYSIS.
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Frecuencias

Notas

Salida creada		
Comentarios		
Entrada	Datos	
	Conjunto de datos activo	
	Filtro	
	Ponderación	
	Segmentar archivo	
	N de filas en el archivo de datos de trabajo	
Manejo de valores perdidos	Definición de perdidos	
	Casos utilizados	
Sintaxis		
Recursos	Tiempo de procesador	
	Tiempo transcurrido	

Notas

Salida creada		29-MAR-2023 12:03:51
Comentarios		
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	Filtro	<ninguno>
	Ponderación	<ninguno>
	Segmentar archivo	<ninguno>
	N de filas en el archivo de datos de trabajo	299
Manejo de valores perdidos	Definición de perdidos	Los valores perdidos definidos por el usuario se tratan como perdidos.

	Casos utilizados	Las estadísticas se basan en todos los casos con datos válidos.
Sintaxis		FREQUENCIES VARIABLES=Semestre Grade Career Sexo /BARCHART FREQ /ORDER=ANALYSIS.
Recursos	Tiempo de procesador	00:00:00.36
	Tiempo transcurrido	00:00:00.47

[ConjuntoDatos1] C:\Users\UM Educación\Desktop\WilliamGitova_NoOutliers_Semestre.sav

Estadísticos

		Semester	Grade	Career	Sex
N	Válido	299	299	299	299
	Perdidos	0	0	0	0

Tabla de frecuencia

Semester

		Frecuencia	Porcentaje	Porcentaje válido	Porcentaje acumulado
Válido	10	46	15.4	15.4	15.4
	2	52	17.4	17.4	32.8
	4	69	23.1	23.1	55.9
	6	79	26.4	26.4	82.3
	8	53	17.7	17.7	100.0
	Total	299	100.0	100.0	

Grade

		Frecuencia	Porcentaje	Porcentaje válido	Porcentaje acumulado
Válido	First	52	17.4	17.4	17.4
	Second	69	23.1	23.1	40.5
	Third	79	26.4	26.4	66.9
	Fourth	53	17.7	17.7	84.6
	Fifth	46	15.4	15.4	100.0
	Total	299	100.0	100.0	

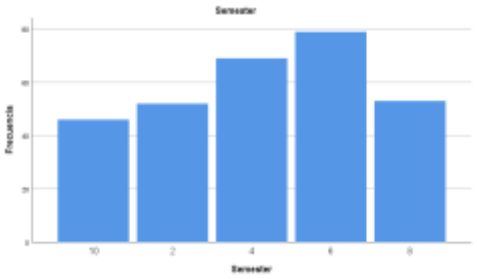
Career

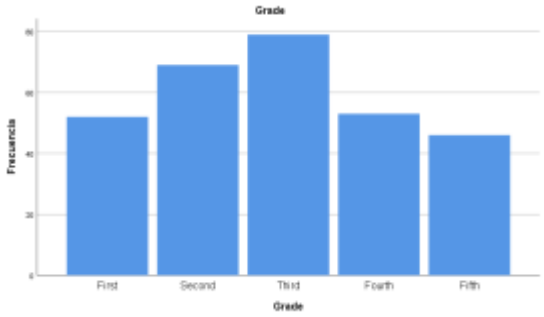
		Frecuencia	Porcentaje	Porcentaje válido	Porcentaje acumulado
Válido	1	198	66.2	66.2	66.2
	2	101	33.8	33.8	100.0
	Total	299	100.0	100.0	

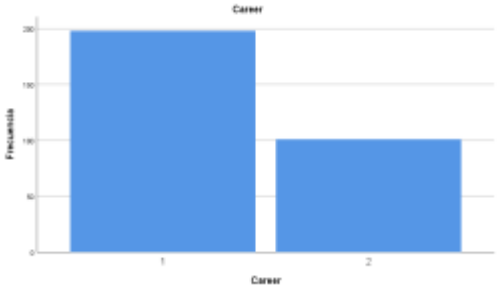
Sex

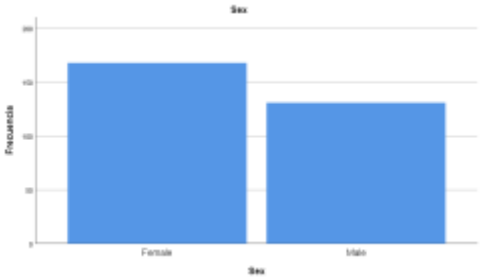
		Frecuencia	Porcentaje	Porcentaje válido	Porcentaje acumulado
Válido	Female	168	56.2	56.2	56.2
	Male	131	43.8	43.8	100.0
	Total	299	100.0	100.0	

Gráfico de barras









Notas

Salida creada		
Comentarios		
Entrada	Datos	
	Conjunto de datos activo	
	Filtro	
	Ponderación	
	Segmentar archivo	
	N de filas en el archivo de datos de trabajo	
Manejo de valores perdidos	Definición de perdidos	
	Casos utilizados	
Sintaxis		
Recursos	Tiempo de procesador	
	Tiempo transcurrido	

Notas

Salida creada		29-MAR-2023 12:04:35
Comentarios		
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	Conjunto de datos activo	ConjuntoDatos1
	Filtro	<ninguno>
	Ponderación	<ninguno>
	Segmentar archivo	<ninguno>
	N de filas en el archivo de datos de trabajo	299
Manejo de valores perdidos	Definición de perdidos	Los valores perdidos definidos por el usuario se tratan como perdidos.
	Casos utilizados	Las estadísticas se basan en todos los casos con datos válidos.
Sintaxis		FREQUENCIES VARIABLES=Age /STATISTICS=STDDEV MEAN /BARCHART FREQ /ORDER=ANALYSIS.
Recursos	Tiempo de procesador	00:00:00.11
	Tiempo transcurrido	00:00:00.13

Estadísticos

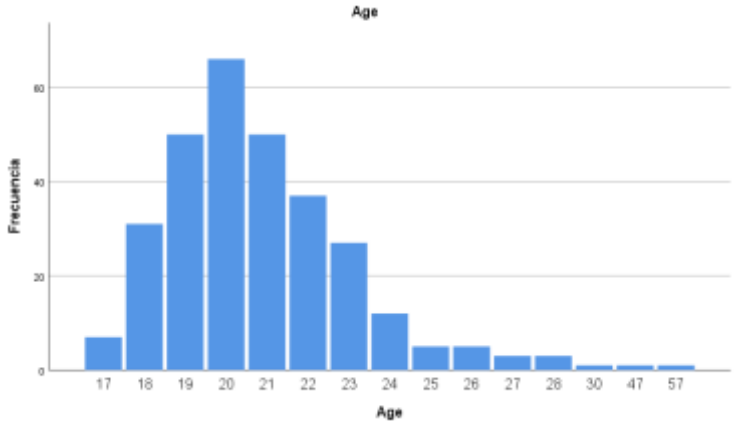
Age

N	Válido	299
	Perdidos	0
Media		20.98
Desv. Desviación		3.389

Age

		Frecuencia	Porcentaje	Porcentaje válido	Porcentaje acumulado
Válido	17	7	2.3	2.3	2.3
	18	31	10.4	10.4	12.7
	19	50	16.7	16.7	29.4
	20	66	22.1	22.1	51.5
	21	50	16.7	16.7	68.2
	22	37	12.4	12.4	80.6
	23	27	9.0	9.0	89.6
	24	12	4.0	4.0	93.6
	25	5	1.7	1.7	95.3
	26	5	1.7	1.7	97.0

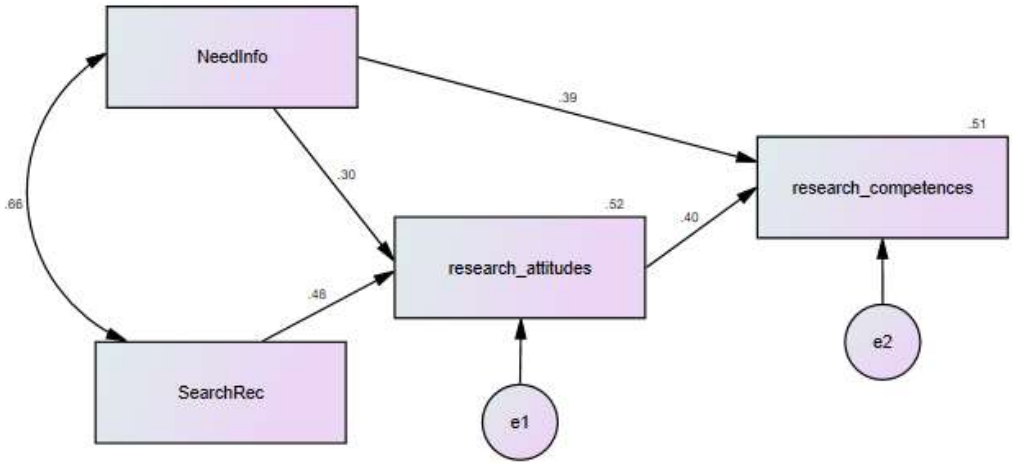
	27	3	1.0	1.0	98.0
	28	3	1.0	1.0	99.0
	30	1	.3	.3	99.3
	47	1	.3	.3	99.7
	57	1	.3	.3	100.0
	Total	299	100.0	100.0	



APPENDIX E

HYPHOTESIS TEST

Hypothesis Test: Path Analysis



x2 = 3.496, p = .061, x2/gl = 3.496, RMSEA = .089,
AGFI = .945, GFI = .995, TLI = .976, NFI = .995, CFI = .996, RMR=.009

Analysis Summary

Date and Time

Date: Thursday, March 23, 2023
Time: 10:34:08 AM

Title

Path research_comp: Thursday, March 23, 2023 10:34 AM

Notes

Bootstrap confidence intervals are not available when the Bollen-Stine bootstrap is performed.

Groups

Group number 1 (Group number 1)

Notes for Group (Group number 1)

The model is recursive.
Sample size = 316

Variable Summary (Group number 1)

Your model contains the following variables (Group number 1)

Observed, endogenous variables

research_competences
research_attitudes
Observed, exogenous variables
NeedInfo
SearchRec
Unobserved, exogenous variables
e2
e1

Variable counts (Group number 1)

Number of variables in your model:	6
Number of observed variables:	4
Number of unobserved variables:	2
Number of exogenous variables:	4
Number of endogenous variables:	2

Parameter Summary (Group number 1)

	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed	2	0	0	0	0	2
Labeled	0	0	0	0	0	0
Unlabeled	4	1	4	0	0	9
Total	6	1	4	0	0	11

Assessment of normality (Group number 1)

Variable	min	max	skew	c.r.	kurtosis	c.r.
SearchRec	1.000	5.000	-1.419	-10.298	3.273	11.875
NeedInfo	1.000	5.000	-.511	-3.710	.195	.709
research_attitudes	1.277	5.000	-1.139	-8.264	2.339	8.486
research_competences	1.000	5.000	-.591	-4.286	.696	2.524
Multivariate					14.610	18.743

Observations farthest from the centroid (Mahalanobis distance) (Group number 1)

Observation number	Mahalanobis d-squared	p1	p2
112	39.435	.000	.000
213	34.194	.000	.000
313	28.852	.000	.000
128	21.248	.000	.000
214	20.325	.000	.000
207	19.113	.001	.000
19	18.127	.001	.000

Observation number	Mahalanobis d-squared	p1	p2
203	17.825	.001	.000
87	17.195	.002	.000
267	16.962	.002	.000
180	16.200	.003	.000
67	15.748	.003	.000
250	14.164	.007	.000
192	14.098	.007	.000
88	13.767	.008	.000
161	13.427	.009	.000
195	13.224	.010	.000
299	12.807	.012	.000
172	11.781	.019	.000
106	11.307	.023	.000
234	11.193	.024	.000
152	10.853	.028	.000
223	10.512	.033	.000
227	10.302	.036	.000
295	10.013	.040	.001
157	9.907	.042	.001
60	9.810	.044	.001
293	9.737	.045	.001
245	9.456	.051	.002
230	8.954	.062	.015
284	8.601	.072	.050
108	8.224	.084	.153
271	8.159	.086	.142
303	7.991	.092	.191
115	7.877	.096	.214
314	7.815	.099	.204
93	7.691	.104	.240
176	7.302	.121	.536
147	7.262	.123	.509
47	7.240	.124	.464
121	7.220	.125	.419
118	7.188	.126	.386
139	7.170	.127	.342
281	6.869	.143	.599
107	6.810	.146	.601
52	6.754	.149	.602
33	6.605	.158	.702

Observation number	Mahalanobis d-squared	p1	p2
70	6.514	.164	.740
116	6.210	.184	.922
197	6.163	.187	.921
101	6.125	.190	.917
169	6.032	.197	.937
310	5.948	.203	.951
117	5.943	.203	.937
305	5.827	.212	.961
28	5.705	.222	.979
66	5.555	.235	.992
241	5.554	.235	.989
99	5.542	.236	.985
35	5.476	.242	.989
226	5.463	.243	.986
109	5.334	.255	.994
82	5.244	.263	.997
168	5.233	.264	.996
94	5.104	.277	.998
32	5.084	.279	.998
287	5.014	.286	.999
282	4.937	.294	.999
39	4.921	.296	.999
42	4.865	.301	.999
9	4.784	.310	1.000
69	4.666	.323	1.000
240	4.658	.324	1.000
23	4.575	.334	1.000
11	4.479	.345	1.000
119	4.472	.346	1.000
102	4.445	.349	1.000
62	4.441	.350	1.000
290	4.390	.356	1.000
288	4.366	.359	1.000
5	4.339	.362	1.000
6	4.339	.362	1.000
130	4.339	.362	1.000
263	4.339	.362	1.000
291	4.339	.362	1.000
307	4.329	.363	1.000
229	4.327	.364	1.000

Observation number	Mahalanobis d-squared	p1	p2
77	4.289	.368	1.000
140	4.286	.369	1.000
8	4.276	.370	.999
164	4.260	.372	.999
138	4.235	.375	.999
252	4.224	.377	.999
257	4.152	.386	1.000
34	4.017	.404	1.000
232	4.002	.406	1.000
211	3.923	.417	1.000
242	3.884	.422	1.000
7	3.859	.425	1.000
218	3.825	.430	1.000

Sample Moments (Group number 1)

Sample Covariances (Group number 1)

	Search-Rec	NeedI-nfo	research_attitu-des	research_competen-ces
SearchRec	.540			
NeedInfo	.400	.676		
research_attitudes	.333	.339	.439	
research_competen-ces	.337	.416	.336	.623

Condition number = 11.635
Eigenvalues
1.664 .251 .222 .143
Determinant of sample covariance matrix = .013

Sample Correlations (Group number 1)

	Search-Rec	NeedI-nfo	research_attitu-des	research_competen-ces
SearchRec	1.000			
NeedInfo	.661	1.000		
research_attitudes	.683	.622	1.000	
research_competen-ces	.581	.641	.642	1.000

Condition number = 10.295
Eigenvalues
2.915 .424 .378 .283

Models

Default model (Default model)

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments:	10
Number of distinct parameters to be estimated:	9
Degrees of freedom (10 - 9):	1

Result (Default model)

Minimum was achieved
Chi-square = 3.496
Degrees of freedom = 1
Probability level = .061

Group number 1 (Group number 1 - Default model)

Estimates (Group number 1 - Default model)

Scalar Estimates (Group number 1 - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
research_attitudes	<---	SearchRec	.436	.047	9.265	***	par_4
research_attitudes	<---	NeedInfo	.244	.042	5.793	***	par_5
research_competences	<---	NeedInfo	.378	.048	7.804	***	par_1
research_competences	<---	research_attitudes	.473	.060	7.861	***	par_2

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
research_attitudes	<---	SearchRec	.483
research_attitudes	<---	NeedInfo	.302
research_competences	<---	NeedInfo	.394
research_competences	<---	research_attitudes	.397

Covariances: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
NeedInfo	<-->	SearchRec	.400	.041	9.789	***	par_3

Correlations: (Group number 1 - Default model)

	Estimate
NeedInfo <--> SearchRec	.661

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
NeedInfo	.676	.054	12.550	***	par_6
SearchRec	.540	.043	12.550	***	par_7
e1	.212	.017	12.550	***	par_8
e2	.307	.024	12.550	***	par_9

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
research_attitudes	.518
research_competences	.507

Matrices (Group number 1 - Default model)

Implied (for all variables) Covariances (Group number 1 - Default model)

	Search-Rec	NeedI-nfo	research_attitu-des	research_competen-ces
SearchRec	.540			
NeedInfo	.400	.676		
research_attitudes	.333	.339	.439	
research_competen-ces	.308	.416	.336	.623

Implied (for all variables) Correlations (Group number 1 - Default model)

	Search-Rec	NeedI-nfo	research_attitu-des	research_competen-ces
SearchRec	1.000			
NeedInfo	.661	1.000		
research_attitudes	.683	.622	1.000	
research_competen-ces	.532	.641	.642	1.000

Implied Covariances (Group number 1 - Default model)

	Search-Rec	NeedI-nfo	research_attitu-des	research_competen-ces
SearchRec	.540			
NeedInfo	.400	.676		
research_attitudes	.333	.339	.439	
research_competen-ces	.308	.416	.336	.623

Implied Correlations (Group number 1 - Default model)

	Search-Rec	NeedI-nfo	research_attitu-des	research_competen-ces
SearchRec	1.000			
NeedInfo	.661	1.000		
research_attitudes	.683	.622	1.000	
research_competen-ces	.532	.641	.642	1.000

Residual Covariances (Group number 1 - Default model)

	Search-Rec	NeedI-nfo	research_attitu-des	research_competen-ces
SearchRec	.000			
NeedInfo	.000	.000		
research_attitudes	.000	.000	.000	
research_competen-ces	.028	.000	.000	.000

Standardized Residual Covariances (Group number 1 - Default model)

	Search-Rec	NeedI-nfo	research_attitu-des	research_competen-ces
SearchRec	.000			
NeedInfo	.000	.000		
research_attitudes	.000	.000	.000	
research_competen-ces	.769	.000	.000	.000

Factor Score Weights (Group number 1 - Default model)

Total Effects (Group number 1 - Default model)

	SearchRec	NeedInfo	research_attitudes
research_attitudes	.436	.244	.000
research_competences	.206	.493	.473

Standardized Total Effects (Group number 1 - Default model)

	SearchRec	NeedInfo	research_attitudes
research_attitudes	.483	.302	.000
research_competences	.192	.514	.397

Direct Effects (Group number 1 - Default model)

	SearchRec	NeedInfo	research_attitudes
research_attitudes	.436	.244	.000
research_competences	.000	.378	.473

Standardized Direct Effects (Group number 1 - Default model)

	SearchRec	NeedInfo	research_attitudes
research_attitudes	.483	.302	.000
research_competences	.000	.394	.397

Indirect Effects (Group number 1 - Default model)

	SearchRec	NeedInfo	research_attitudes
research_attitudes	.000	.000	.000
research_competences	.206	.115	.000

Standardized Indirect Effects (Group number 1 - Default model)

	SearchRec	NeedInfo	research_attitudes
research_attitudes	.000	.000	.000
research_competences	.192	.120	.000

Modification Indices (Group number 1 - Default model)

Covariances: (Group number 1 - Default model)

	M.I.	Par Change

Variances: (Group number 1 - Default model)

	M.I.	Par Change

Regression Weights: (Group number 1 - Default model)

	M.I.	Par Change

Minimization History (Default model)

Iteration		Negative eigenvalues	Condition #	Smallest eigenvalue	Diameter	F	NTries	Ratio
0	e	3		-.218	9999.000	494.988	0	9999.000
1	e*	0	39.669		.853	72.914	18	.869
2	e	0	20.260		.516	33.791	2	.000
3	e	0	24.621		.204	6.520	1	1.175
4	e	0	26.687		.080	3.563	1	1.089
5	e	0	28.297		.011	3.497	1	1.020
6	e	0	27.735		.000	3.496	1	1.001

Pairwise Parameter Comparisons (Default model)

Variance-covariance Matrix of Estimates (Default model)

	par_1	par_2	par_3	par_4	par_5	par_6	par_7	par_8	par_9
par_1	.002								
par_2	-.002	.004							
par_3	.000	.000	.002						
par_4	.000	.000	.000	.002					
par_5	.000	.000	.000	-.001	.002				
par_6	.000	.000	.002	.000	.000	.003			
par_7	.000	.000	.001	.000	.000	.001	.002		
par_8	.000	.000	.000	.000	.000	.000	.000	.000	
par_9	.000	.000	.000	.000	.000	.000	.000	.000	.001

Correlations of Estimates (Default model)

	par_1	par_2	par_3	par_4	par_5	par_6	par_7	par_8	par_9
par_1	1.000								
par_2	-.622	1.000							
par_3	.000	.000	1.000						
par_4	.000	.000	.000	1.000					
par_5	.000	.000	.000	-.661	1.000				
par_6	.000	.000	.780	.000	.000	1.000			
par_7	.000	.000	.780	.000	.000	.437	1.000		

	par_1	par_2	par_3	par_4	par_5	par_6	par_7	par_8	par_9
par_8	.000	.000	.000	.000	.000	.000	.000	1.000	
par_9	.000	.000	.000	.000	.000	.000	.000	.000	1.000

Critical Ratios for Differences between Parameters (Default model)

	par_1	par_2	par_3	par_4	par_5	par_6	par_7	par_8	par_9
par_1	.000								
par_2	.964	.000							
par_3	.340	-1.002	.000						
par_4	.852	-.482	.579	.000					
par_5	-2.099	-3.122	-2.665	-2.367	.000				
par_6	4.112	2.523	8.196	3.362	6.331	.000			
par_7	2.501	.917	5.041	1.641	4.932	-2.601	.000		
par_8	-3.240	-4.174	-4.251	-4.480	-.698	-8.223	-7.102	.000	
par_9	-1.312	-2.551	-1.948	-2.429	1.304	-6.240	-4.713	3.199	.000

Bootstrap (Default model)

Summary of Bootstrap Iterations (Default model)

(Default model)

Iterations	Method 0	Method 1	Method 2
1	0	0	0
2	0	0	0
3	0	1	0
4	0	77	0
5	0	399	0
6	0	388	0
7	0	121	0
8	0	13	0
9	0	1	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0

Iterations	Method 0	Method 1	Method 2
Total	0	1000	0

0 bootstrap samples were unused because of a singular covariance matrix.
0 bootstrap samples were unused because a solution was not found.
1000 usable bootstrap samples were obtained.

Bollen-Stine Bootstrap (Default model)

The model fit better in 772 bootstrap samples.
It fit about equally well in 0 bootstrap samples.
It fit worse or failed to fit in 228 bootstrap samples.
Testing the null hypothesis that the model is correct, Bollen-Stine bootstrap p = .229

Bootstrap Distributions (Default model)

ML discrepancy (implied vs sample) (Default model)

```
                          |--------------------
                  .000    |**********
                 1.601    |**********
                 3.201    |*******
                 4.802    |****
                 6.402    |**
                 8.003    |**
                 9.603    |*
N = 1000        11.204    |*
Mean = 2.355    12.804    |*
S. e. = .097    14.405    |*
                16.005    |*
                17.606    |
                19.206    |*
                20.807    |
                22.407    |*
                          |--------------------
```

Miscellaneous

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	9	3.496	1	.061	3.496
Saturated model	10	.000	0		

Model	NPAR	CMIN	DF	P	CMIN/DF
Independence model	4	637.301	6	.000	106.217

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.009	.995	.945	.099
Saturated model	.000	1.000		
Independence model	.280	.449	.082	.270

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.995	.967	.996	.976	.996
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.167	.166	.166
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	2.496	.000	12.353
Saturated model	.000	.000	.000
Independence model	631.301	552.107	717.892

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.011	.008	.000	.039
Saturated model	.000	.000	.000	.000
Independence model	2.023	2.004	1.753	2.279

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.089	.000	.198	.166

Model	RMSEA	LO 90	HI 90	PCLOSE
Independence model	.578	.540	.616	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	21.496	21.787	55.298	64.298
Saturated model	20.000	20.323	57.557	67.557
Independence model	645.301	645.430	660.324	664.324

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.068	.060	.100	.069
Saturated model	.063	.063	.063	.065
Independence model	2.049	1.797	2.323	2.049

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	347	598
Independence model	7	9

Execution time summary

Minimization:	.025
Miscellaneous:	.214
Bootstrap:	.094
Total:	.333

Prueba T: Constructos y dimensiones por carrera

Estadísticas de grupo

	Carrera	N	Media	Desv. Desviación	Desv. Error pro-medio
NeedInfo	1	214	3.4204	.84644	.05786
	2	102	3.5757	.76701	.07595
SearchRec	1	214	3.9612	.78490	.05365
	2	102	4.0625	.62002	.06139
Affective	1	214	3.6013	.80786	.05522
	2	102	3.8433	.68213	.06754
Cognositive	1	214	3.4509	.88939	.06080
	2	102	3.6005	.91079	.09018
Behavior	1	214	4.4444	.81401	.05564
	2	102	4.6012	.54925	.05438
ResearchProblem	1	214	3.3426	.95224	.06509
	2	102	3.5914	.79180	.07840
MethodFrame	1	214	3.6917	.90597	.06193
	2	102	3.6177	.77594	.07683
research_attitudes	1	214	3.8322	.694624631735827	.047483562281930
	2	102	4.015000000000002	.578404495293750	.057270578986177
research_competences	1	214	3.51715	.824736	.056378
	2	102	3.60456	.713759	.070673

Prueba de muestras independientes

		Prueba de Levene de igualdad de varianzas		prueba t para la igualdad de medias						
									95% de intervalo de confianza de la diferencia	
		F	Sig.	t	gl	Sig. (bilateral)	Diferencia de medias	Diferencia de error estándar	Inferior	Superior
NeedInfo	Se asumen varianzas iguales	1.663	.198	-1.571	314	.117	-.15531	.09887	-.34984	.03922
	No se asumen varianzas iguales			-1.627	217.531	.105	-.15531	.09548	-.34349	.03286
SearchRec	Se asumen varianzas iguales	3.247	.073	-1.144	314	.254	-.10128	.08854	-.27550	.07293
	No se asumen varianzas iguales			-1.242	246.128	.215	-.10128	.08153	-.26187	.05931
Affective	Se asumen varianzas iguales	2.400	.122	-2.614	314	.009	-.24207	.09261	-.42428	-.05987
	No se asumen varianzas iguales			-2.775	232.016	.006	-.24207	.08724	-.41396	-.07018
Cognositive	Se asumen varianzas iguales	.325	.569	-1.387	314	.166	-.14956	.10785	-.36175	.06264
	No se asumen varianzas iguales			-1.375	194.611	.171	-.14956	.10876	-.36406	.06495
Behavior	Se asumen varianzas iguales	6.056	.014	-1.762	314	.079	-.15674	.08895	-.33175	.01827
	No se asumen varianzas iguales			-2.014	278.454	.045	-.15674	.07781	-.30990	-.00357

Resear-chProblem	Se asumen varianzas iguales	1.794	.181	-2.288	314	.023	-.24880	.10874	-.46275	-.03485
	No se asumen varianzas iguales			-2.442	235.238	.015	-.24880	.10190	-.44956	-.04805
Metho-dFrame	Se asumen varianzas iguales	1.001	.318	.710	314	.478	.07398	.10423	-.13109	.27906
	No se asumen varianzas iguales			.750	229.043	.454	.07398	.09868	-.12046	.26842
research_attitudes	Se asumen varianzas iguales	1.959	.163	-2.304	314	.022	-.182788161993773	.079348402130118	-.338909927951607	-.026666396035940
	No se asumen varianzas iguales			-2.457	234.943	.015	-.182788161993773	.074394945422346	-.329354578130177	-.036221745857370
re-search_com-petences	Se asumen varianzas iguales	.613	.434	-.919	314	.359	-.087409	.095142	-.274605	.099786
	No se asumen varianzas iguales			-.967	226.882	.335	-.087409	.090405	-.265550	.090732

ANOVA: Diferencias de constructos por semestres de Fac. 1

ANOVA

		Suma de cuadrados	gl	Media cuadrática	F	Sig.
research_attitudes	Entre grupos	.759	4	.190	.384	.820
	Dentro de grupos	99.291	201	.494		
	Total	100.051	205			
research_competences	Entre grupos	12.634	4	3.159	4.938	.001
	Dentro de grupos	128.576	201	.640		
	Total	141.210	205			

Pruebas post hoc

Comparaciones múltiples

HSD Tukey

Variable dependiente	(I) Semestre	(J) Semestre	Diferencia de medias (I-J)	Desv. Error	Sig.	Intervalo de confianza al 95% Límite inferior	Límite superior
research_attitudes	2	4	.067808641975310	.169077614587796	.995	-.397611242421809	.533228526372430
		6	.105330009496676	.166720104112666	.970	-.353600356725759	.564260375719111
		8	.009753086419752	.169077614587796	1.000	-.455666797977367	.475172970816872
		10	-.076806053365192	.185015983589774	.994	-.586099479960456	.432487373230071
	4	2	-.067808641975310	.169077614587796	.995	-.533228526372430	.397611242421809
		6	.037521367521366	.140681078983716	.999	-.349731384281943	.424774119324674

		8	-.05805555555558	.1434671133 86251	.994	-.4529774231 83073	.33686631 2071957
		10	-.14461469534 0502	.1619459386 72063	.899	-.5904032181 97834	.30117382 7516829
	6	2	-.10533000949 6676	.1667201041 12666	.970	-.5642603757 19111	.35360035 6725759
		4	-.03752136752 1366	.1406810789 83716	.999	-.4247741193 24674	.34973138 4281943
		8	-.09557692307 6924	.1406810789 83716	.961	-.4828296748 80232	.29167582 8726385
		10	-.18213606286 1868	.1594830411 45492	.784	-.6211449686 48701	.25687284 2924965
	8	2	-.00975308641 9752	.1690776145 87796	1.000	-.4751729708 16872	.45566679 7977367
		4	.05805555555 5558	.1434671133 86251	.994	-.3368663120 71957	.45297742 3183073
		6	.09557692307 6924	.1406810789 83716	.961	-.2916758287 26385	.48282967 4880232
		10	-.08655913978 4944	.1619459386 72063	.984	-.5323476626 42276	.35922938 3072387
	10	2	.07680605336 5192	.1850159835 89774	.994	-.4324873732 30071	.58609947 9960456
		4	.14461469534 0502	.1619459386 72063	.899	-.3011738275 16829	.59040321 8197834
		6	.18213606286 1868	.1594830411 45492	.784	-.2568728429 24965	.62114496 8648701

		8	.086559139784944	.161945938672063	.984	-.359229383072387	.532347662642276
research_competences	2	4	-.207755	.192402	.817	-.73738	.32187
		6	-.009501	.189720	1.000	-.53174	.51274
		8	-.600046*	.192402	.018	-1.12967	-.07042
		10	-.505866	.210540	.119	-1.08542	.07369
	4	2	.207755	.192402	.817	-.32187	.73738
		6	.198253	.160089	.729	-.24242	.63893
		8	-.392292	.163259	.119	-.84169	.05711
		10	-.298112	.184287	.488	-.80540	.20918
	6	2	.009501	.189720	1.000	-.51274	.53174
		4	-.198253	.160089	.729	-.63893	.24242
		8	-.590545*	.160089	.003	-1.03122	-.14987
		10	-.496365	.181484	.052	-.99594	.00321
	8	2	.600046*	.192402	.018	.07042	1.12967
		4	.392292	.163259	.119	-.05711	.84169
		6	.590545*	.160089	.003	.14987	1.03122
		10	.094180	.184287	.986	-.41311	.60147
	10	2	.505866	.210540	.119	-.07369	1.08542
		4	.298112	.184287	.488	-.20918	.80540
		6	.496365	.181484	.052	-.00321	.99594
		8	-.094180	.184287	.986	-.60147	.41311

*. La diferencia de medias es significativa en el nivel .05.

Descriptivos

	Semestre			Estadístico	Desv. Error
research_competences	2	Media		3.24704	.20407
		95% de intervalo de confianza para la media	Límite inferior	2.82756	
			Límite superior	3.66651	
		Media recortada al 5%		3.27456	
		Mediana		3.50000	
		Varianza		1.124	
		Desv. Desviación		1.060390	
		Mínimo		1.000	
		Máximo		5.000	
		Rango		4.000	
		Rango intercuartil		.835	
		Asimetría		-.752	.448
		Curtosis		.050	.872
	4	Media		3.45479	.10811
		95% de intervalo de confianza para la media	Límite inferior	3.23730	
			Límite superior	3.67229	
		Media recortada al 5%		3.46898	
		Mediana		3.50000	
		Varianza		.561	
		Desv. Desviación		.749024	
		Mínimo		1.665	
		Máximo		5.000	
		Rango		3.335	
		Rango intercuartil		.835	
		Asimetría		-.241	.343
		Curtosis		.326	.674
	6	Media		3.25654	.12821
		95% de intervalo de confianza para la media	Límite inferior	2.99914	
			Límite superior	3.51394	
		Media recortada al 5%		3.27577	
		Mediana		3.50000	

		Varianza		.855	
		Desv. Desviación		.924570	
		Mínimo		1.000	
		Máximo		5.000	
		Rango		4.000	
		Rango intercuartil		1.129	
		Asimetría		-.475	.330
		Curtosis		-.084	.650
	8	Media		3.84708	.080020
		95% de intervalo de confianza para la media	Límite inferior	3.68610	
			Límite superior	4.00806	
		Media recortada al 5%		3.84472	
		Mediana		3.83500	
		Varianza		.307	
		Desv. Desviación		.554393	
		Mínimo		2.665	
		Máximo		5.000	
		Rango		2.335	
		Rango intercuartil		.669	
		Asimetría		.015	.343
		Curtosis		-.213	.674
	10	Media		3.75290	.126706
		95% de intervalo de confianza para la media	Límite inferior	3.49413	
			Límite superior	4.01167	
		Media recortada al 5%		3.77765	
		Mediana		3.67000	
		Varianza		.498	
		Desv. Desviación		.705470	
		Mínimo		2.000	
		Máximo		5.000	
		Rango		3.000	
		Rango intercuartil		.830	
		Asimetría		-.365	.421
		Curtosis		.255	.821

ANOVA: Diferencias de constructos por semestres de Fac. 2

NO SE ENCONTRARON DIFERENCIAS SIGNIFICATIVAS

ANOVA

		Suma de cuadrados	gl	Media cuadrática	F	Sig.
research_attitudes	Entre grupos	.376	4	.094	.277	.892
	Dentro de grupos	31.886	94	.339		
	Total	32.262	98			
research_competences	Entre grupos	1.991	4	.498	1.024	.399
	Dentro de grupos	45.694	94	.486		
	Total	47.685	98			

Prueba T: Diferencias en constructos y dimensiones de acuerdo al género

Estadísticas de grupo

	Sexo	N	Media	Desv. Desviación	Desv. Error promedio
NeedInfo	1	171	3.5420	.77893	.05957
	2	134	3.3757	.85220	.07362
SearchRec	1	171	4.0353	.64407	.04925
	2	134	3.9180	.84822	.07328
Affective	1	171	3.7037	.73487	.05620
	2	134	3.6270	.83459	.07210
Cognositive	1	171	3.5015	.86198	.06592
	2	134	3.4478	.93495	.08077
Behavior	1	171	4.5658	.66802	.05108
	2	134	4.3881	.83794	.07239
ResearchProblem	1	171	3.4050	.93984	.07187
	2	134	3.4456	.85247	.07364
MethodFrame	1	171	3.6589	.89539	.06847
	2	134	3.6769	.82983	.07169

research_attitudes	1	171	3.923645224171537	.59870713119962025900	.04578427862540613
	2	134	3.820970149253731	.74093258138863054613	.06400682626551517
research_competences	1	171	3.53199	.817964	.062551
	2	134	3.56123	.754445	.065174

Prueba de muestras independientes

		Prueba de Levene de igualdad de varianzas		prueba t para la igualdad de medias						
									95% de intervalo de confianza de la diferencia	
		F	Sig.	t	gl	Sig. (bilateral)	Diferencia de medias	Diferencia de error estándar	Inferior	Superior
NeedInfo	Se asumen varianzas iguales	1.601	.207	1.775	303	.077	.16624	.09367	-.01809	.35057
	No se asumen varianzas iguales			1.755	272.703	.080	.16624	.09470	-.02019	.35268
SearchRec	Se asumen varianzas iguales	5.223	.023	1.373	303	.171	.11734	.08545	-.05081	.28549

	No se asumen varianzas iguales			1.329	241.728	.185	.11734	.08829	-.05658	.29125
Affective	Se asumen varianzas iguales	3.453	.064	.852	303	.395	.07667	.090001	-.10046	.25380
	No se asumen varianzas iguales			.839	266.687	.402	.07667	.09141	-.10331	.25665
Cognositive	Se asumen varianzas iguales	.900	.344	.520	303	.603	.05370	.10323	-.14943	.25684
	No se asumen varianzas iguales			.515	274.059	.607	.05370	.10425	-.15154	.25894
Behavior	Se asumen varianzas iguales	4.876	.028	2.060	303	.040	.17766	.08623	.00798	.34733
	No se asumen varianzas iguales			2.005	249.962	.046	.17766	.08860	.00316	.35215
ResearchProblem	Se asumen varianzas iguales	.836	.361	-.390	303	.697	-.04057	.10413	-.24547	.16433
	No se asumen varianzas iguales			-.394	296.543	.694	-.04057	.10290	-.24308	.16194

MethodFrame	Se asumen varianzas iguales	2.305	.130	-.179	303	.858	-.01792	.10005	-.21481	.17897
	No se asumen varianzas iguales			-.181	294.565	.857	-.01792	.09913	-.21302	.17718
research_attitudes	Se asumen varianzas iguales	3.159	.077	1.338	303	.182	.102675074917806	.076709856422887	-.048276429086216	.253626578921828
	No se asumen varianzas iguales			1.305	252.254	.193	.102675074917806	.078696086157332	-.052310003581686	.257660153417298
research_competences	Se asumen varianzas iguales	2.912	.089	-.321	303	.749	-.029243	.091226	-.208759	.150273
	No se asumen varianzas iguales			-.324	295.027	.746	-.029243	.090335	-.207025	.148539

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