

Research Article

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Undergraduate Teaching in Scientific Research: A Systematic Review of the Literature Available in Scopus, Eric and Scielo, 2012-2021

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Abstract

Teaching in research at the university level is a complex task that articulates, experience, methodology and research skills of the faculty. Developing research implies creativity, dedication of hours and the development of an innovative identity in university professors, which is a priority in higher education institutions. The objective of this study was to systematize the scientific evidence on the teaching of research in various disciplines at the university level. Verification was performed in the Eric, Scopus and Scielo databases between the years 2012 and 2021. A search equation was used with the terms included in the thesauri of "scientific research" and "teaching". The Boolean operators "AND" and "OR" were used and the exclusion and inclusion criteria of temporality, subject, language, type and accessibility to scientific literature were used. Twenty articles were identified that answered the question: What is the scientific evidence on university teaching in scientific research, identifying the pedagogical dimension, complexity of teaching, techniques and instruments, and predominance of teaching over research? The results indicate that university professors should be aware and should recognize that despite having extensive professional experience, they should improve their research skills, so as to offer a range of possibilities to students for research. It is concluded that whatever the discipline to be developed at the university level, scientific research should be strengthened through the reading of scientific articles, preferably housed in indexed scientific journals and belonging to or promoting research networks.

Keywords: teaching; university; university education; research education; research teaching; scientific research

1. Introduction

University scientific research allows students to strengthen their critical thinking through the scientific method (Mnguni, 2021; Yuan et al., 2020). The responsibility of guiding students in this training process falls on the faculty, who must be at the forefront, using all scientific tools to strengthen them in the research process (Hein et al., 2019; Odigwe et al., 2020; Rachmawati et al., 2021; Scott, 1998; Tesouro & Puiggalí, 2015). It highlights among academic actors the ability and commitment in the face of adversity to organize and improve the teaching of scientific research in universities, which is reflected in scientific production (Brennan et al., 2019; Daumiller & Dresel, 2020; Ismayilova & Klassen, 2019; X. Zhang & Shi, 2019). The interaction between faculty and students, with a focus on research, especially in articles for the dissemination of science, is fruitful and advantageous for the development of society, since it provides necessary tools in the face of biased discourses of knowledge, making a significant difference (Kaviani et al., 2021; Shaqra, 2020; Villafranqui Cabanillas, 2020).

The concern about the scientific production of both faculty and students is latent. One strategy used in Latin America is the conversion of undergraduate or graduate theses into scientific articles and their subsequent publication in high impact scientific journals (Cruz Mosquera et al., 2021). If this action is not carried out, the opportunity to transfer knowledge to the international scientific community is lost (Ñique et al., 2021).

The results of a research conducted in Peru on the university theses of the three best Peruvian institutions according to the Scimago ranking revealed that only 1.7% of such research was published as scientific articles (Mamani-Benito et al., 2021). Some authors propose ideas to design and implement experiences that combine research with teaching, deepening the methodological aspect (Olivares-Donoso & González, 2019). However, the majority of students perceive their acquired knowledge of research methodology as regular (Castro Rodríguez et al., 2018), and to complete their university studies they need to present a thesis in which specific research skills are developed (Castro-Rodríguez & Lara-Verástegui, 2021).

In Ecuador, some researchers conducted studies on the importance of students participating in research projects. They analysed theories, approaches, developed interviews and deepened the subject of law and concluded that it is important to participate together in projects or research as part of their training to establish new knowledge, also suggesting the realization of seed projects (Chuico Pardo et al., 2021). In Austria, also concerned about strengthening collaboration at the highest level, it was concluded that the development of collaborative projects is necessary (Meyer et al., 2018).

In Russia, research was conducted on the creation and introduction of a model for the management of scientific activities, in which the capabilities of science are described and can be further used by students. The experiment was conducted from 2019 to 2021, forming groups and assigning roles for the creation of a research product. From this experimental process were obtained scientific publications, presentations at congresses and in academic training that improved their skills. Finally, it allowed forming and studying the social mechanism of research activity management to improve students' flexible skills (Ivanova et al., 2021). It then becomes necessary to disseminate higher education research by adopting a formal taxonomy for research modes (Senseney et al., 2019).

The present research is based on the theory of Roger Lewin and Edgar Morin (Mondino, 2021), since the university system is complex. Roger Lewin's approach was quantitative and Edgar Morin's qualitative. Complexity is positioned as an epistemological option for the investigation of complex realities (Balbo, 2020). Complexity is considered as the union between unity and multiplicity. Since every day human beings face the challenges of complexity in a formal way (Morin, 1999).

The dimensions analysed were: pedagogical research, complexity of teaching, techniques and instruments, and predominance of teaching over research (Balbo, 2020). To this, the use of the diversity of techniques and tools used for the collection of scientific evidence in research has been integrated.

1.1 Pedagogical research

It is necessary to recognize the strategic character of the dialogue between pedagogy and other disciplines (Parra León & León Palencia, 2021), without forgetting that the true objective of all types of research is measured by its theoretical relevance. Generally, immediate problems are solved, leaving aside basic research and opting for applied research that solves problems of the moment (Cataño, 1980). This information is evidenced in proceedings of scientific events, where it is not perceived that scientific research is directed to the epistemic development of science (Martínez Ibarra & Massón Cruz, 2021).

There is a pressure to adapt teaching and research to economic, technical and administrative demands, leaving aside the humanistic culture (Mondino, 2021). Some authors consider that the development of research should link university-business, from the beginning of their academic training, in order to relate it to the real problems they will face in their future work activity (Albats et al., 2020; Gomara et al., 2021; Prokop, 2021). Finally, to prejudge one or the other approach, indicating that they contradict each other is a falsehood since, rather than opposition, their common destiny is their mutual complementation (Sánchez Flores, 2019).

1.2 Complexity of teaching

The reality of education is not simple, having to be approached from the complexity of the human being, which includes the person, intelligence, emotions and values as an integral being (Jie et al., 2021; Sáez Alonso, 2017). Research has become a tortuous process, with rigid models that do not allow creativity, and after developing it with difficulty, they observe that the research products rest on dusty shelves, generating uneasiness in university students and setting negative precedents towards research (Prayoga & Abraham, 2017).

Many students reach the last cycles of study and are faced with the need to develop a research work, not knowing how to research and apply statistical or synthesis tools (Rojas Herrera, 2021; Rojas Ulloa, 2021).

To work as a university teacher, it is not mandatory to be a researcher, but when working in this position, not only does it provide knowledge but also generates new knowledge in students, which is observed as a complex process, just as when teachers do research, they end up developing routine strategies where students are seen as those who receive and reproduce knowledge (Urrea Zazueta & Grijalva Verdugo, 2020).

To enter the research field, it is necessary that the student chooses an advisor who has experience in publishing scientific articles, since he/she assumes the function of advising, illustrating, supporting and sharing his/her research experiences (Guerra & Zuccoli, 2014).

Developing the thesis is not very attractive for some students, being considered as a complex activity that generates disinterest towards research (Ishiyama-Cervantes, 2021; Valenzuela, 2021). It is therefore necessary that most of the publications present the limitations or difficulties of the study, so that they can guide future researchers (Avello Martínez et al., 2019; Ferreira & Serpa, 2020).

1.3 Techniques and instruments

Teachers transmit the various ways of collecting information using different techniques according to the objective of the research. For their transmission they do not remain in traditional teaching, such is the case that they implement strategies like as Problem Based Learning (PBL), which makes the classroom active, dynamic and meaningful, which has a special feature which is born from problematic situations, generating in the students the development of scientific competences (Aslan, 2021; Duque-Cardona & Largo-Taborda, 2021). Likewise, the pedagogical strategy on group reading and use of info graphics with science content allows students to perform scientific inquiry exercises that favor conceptual learning (Becerra-Rodríguez et al., 2021).

It is evident that research strengthens pedagogical practices by creating playful learning environments, developing projects and participating in events, giving students the opportunity to create scenarios and strengthen their knowledge (Domínguez Romero & Bobkina, 2021; Parra Bernal & Agudelo Marín, 2020).

Another strategy is Science Mapping, considered the effective and relevant thread in the exploration of a specific topic (Villalobos García et al., 2021; Y. Zhang et al., 2021), in addition to tutoring for the increase of assertiveness (Esteves Pairazamán et al., 2020), therefore, the ways of teaching research depend on the faculty. A review of the literature on research indicates that the logic followed by research approaches has key moments that turn the research objective.

All of them are born from a problem, and therefore the literature is reviewed, then the process of formulating, projecting and organizing the results. But, for the implementation stage, there are difficulties in several aspects, one of them is the collection of information, so the problem is readjusted or redefined, and since there is a variety of techniques and instruments chosen by the researchers, it is feasible to continue with the research (Toledano-Ayala, 2020).

As university professors and researchers, harmony must be established between the techniques and instruments for collecting information, their analysis and respective processing, through an objective view of the research, where the balance of the imperative techniques for each research is established, according to the methodology proposed (Sánchez et al., 2021).

1.4 Predominance of teaching over research

It is generalized that there is no research culture in teaching, only the academic field is developed and research is left aside (Amézquita Amésquita et al., 2020), being urgent the construction and reconstruction of an epistemic thinking in new teachers (Barnes et al., 2020; Ramírez Genovez, 2021).

If the young reader has difficulty in reading comprehension and is interested in research, the task of university faculty is to talk to him/her in a simple way making research and the research process attractive (Ishiyama-Cervantes, 2020). Another way to strengthen research is to make them participants, motivating them to improve their graduate studies (Newman, 2020). Finally, it is necessary to foster the willingness and commitment of university faculty to teach based on scientific methods (Gougoulakis et al., 2020).

Each country promotes and provides support to its researchers to increase the number of publications in databases recognized worldwide, such as Scopus and Web of Science, these aspects make university faculty and students, every day or academic cycle, set goals to be achieved. At the Ibero-American level, there has recently been a slight increase of 6% in the number of higher institutions with the capacity to publish more than 100 documents (De-Moya-Anegón et al., 2020).

These indicators lead to analyze: How is scientific research being taught in universities? According to the state of the art analyzed, it is necessary to train professionals with critical thinking, interested in new knowledge and capable of fixing a defective research environment because the research future awaits them (Yeo-Teh & Tang, 2021).

2. Materials and Methods

The digital databases analysed were Eric, Scopus and Scielo. The date of information extraction was November 8, 2021. It is important to emphasize that scientific information hosted in databases shows quality, but not all of them are freely accessible (Cortés-Sánchez, 2016). The Scopus database was explored under the institutional license granted by Universidad César Vallejo (Peru), this database considers a wide world coverage on scientific journals, guaranteeing the selection and evaluation of contents (Baas et al., 2020). The Educational Resources Information Center database, which by its acronym is Eric, has free access (Galera Núñez & Pérez Ceballos, 2017) so it was not necessary to obtain access permissions. The Scielo database, which stands for Scientific Electronic Library Online (SciELO), was chosen because it promotes scientific development in and for developing countries,

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through the dissemination of scientific articles, in addition to being freely accessible (Packer, 2014).

The Boolean operator "OR" was used for the synonyms or descriptors according to the UNESCO Thesaurus, of each keyword "scientific research", and "teaching" in the English language (Alexander, 2003; Ferguson & Hebels, 2003; Higuera-Ojito et al., 2018). Likewise, the Boolean operator "AND" was used for the union of the keywords, analysing each term, seeing similarities and avoiding contradictions(Hansson, 2014, 2019; Våge & Iselid, 2010).

The search equation was (applied research OR basic research OR methodology OR research program OR research project OR empirical research OR research) AND (education OR higher education OR education OR higher scientific education OR training education OR end-of-career education), as seen in Table 1.

 Table 1: Keywords searched

Scientific Research	Teaching
OR applied research	OR education
OR basic research	OR higher education
OR interdisciplinary research	OR educational institutions
OR methodology	OR higher scientific education
OR research program	OR training education
OR research project	OR end-of-career education
OR empirical research	
OR research	

The procedure began with the analysis of the key words, then the search equation was created with all the descriptors of "scientific research" and "teaching", both in English. A first search in Spanish yielded a small number of articles.

The search equation was (applied research OR basic research OR interdisciplinary research OR methodology OR research program OR research project OR empirical research OR research) AND (education OR higher education OR educational institutions OR higher scientific education OR training education OR end-of-career education). These were written in the three databases described above with slight differences in order to obtain optimized results (see Tables 2, 3 and 4).

2.1 Search equation in the Eric database

Table 2 shows the search equation, which yields 947 159 documents in the first step called "identification". For the second step called "screening", those documents were considered according to the temporality corresponding to the period 2011 to 2021, identifying 245 675. In the third step called "eligibility", articles in PDF format were included, only those peer-reviewed, types of publication only articles, higher level, teaching methods, leaving 116 articles for analysis. For the fourth step called "inclusion", 18 were chosen for analysis. Finally, after discarding those articles that did not meet the proposed objectives, 3 articles remained.

Search equation in the Eric database				
(applied research OR basic research OR interdisciplinary research OR methodology OR research program				
OR research project OR empirical research OR research) AND (education OR higher education OR				
educational institutions OR higher scientific education OR training education OR end-of-career education)				
Step 1 Step 2 Step 3 Step 4				
947 159	245 675	116	18	

Table 2: Search equation in the Eric database

2.2 Search equation in the Scopus database

Table 3 shows the search equation performed in Scopus, which yielded 328 documents in the first step called "identification". For the second step, called "screening", only documents from 2012 to 2021 were considered, identifying 242. In the third step, called "eligibility", scientific articles in the final stage were included, excluding articles in press, systematic reviews, all with open access, choosing 27 articles. For the fourth step, the 27 articles were analysed and 4 were discarded because they did not contain total open access, leaving 23 scientific articles. Of the 23 documents that were included in the analysis, those that did not meet the objectives were discarded, leaving 15 documents.

Table 3: Search equation in the Scopus database

Search equation in the Scopus database					
(applied AND research OR basic AND research OR interdisciplinary AND research OR methodology OR research AND program OR research AND project OR empirical AND research OR research) AND (education OR higher education OR education OR higher scientific education OR training education OR end-of-career education)					
Step 1 Step 2 Step 3 Step 4					
328	242	27	23		

2.3 Search equation in the Scielo database

Table 4 shows the search equation performed in Scielo, which yielded 368 documents in the initial step called "identification". For the second step ("screening"), those documents with temporality corresponding to the period between 2011 and 2021 were considered, identifying 296. In the third step, called "eligibility", scientific articles with full text in PDF format catalogued as university level research were included, leaving 28 articles. For the fourth step, "inclusion", the 28 scientific articles were analysed, leaving 2 for analysis after validation of their correspondence with the planned objectives.

Table 4: Search equation in the Scielo database

Search equation in the Scielo database				
(applied research OR basic research OR interdisciplinary research OR methodology OR research program OR				
research project OR empirical research OR research) AND (education OR higher education OR educational				
institutions OR higher scientific education OR training education OR end-of-career education)				
Step 1 Step 2 Step 3 Step 4				
368	296	28	2	

2.4 Inclusion and exclusion criteria for scientific articles in Eric, Scopus and Scielo

In each database, inclusion and exclusion criteria were analyzed (Kitchenham, 2004; Kitchenham et al., 2010; Yepes-Nuñez et al., 2021).

Table 5: Inclusion and exclusion criteria for scientific articles in Eric, Scopus and Scielo

Inclusion Criteria	Exclusion criteria
Time period: 2012 -2021	Time period: before 2011 or before
Thematic: social sciences including education	Thematic: any besides social sciences
Language: Spanish, English or Portuguese	Language: any besides Spanish, English or Portuguese

Inclusion Criteria	Exclusion criteria
Accessibility: open access	Accessibility: not open access
Type: original article	Type: letters to the editor, essays, systematic reviews, literature reviews, opinion articles, science mapping, etc.

The Prisma statement was used to detail the workflow concerning steps 1 to 4 (Liberati et al., 2009; Moher et al., 2009; Page et al., 2021), pooling the results from the three databases explored in Figure 1.



Figure 1: PRISMA flow chart.

3. Results

We have divided the results into three sections: selected studies, geographic area where the studies were conducted, and results related to the process of university teaching in scientific research.

3.1 Selected studies

A total of 20 studies were selected. Table 6 shows the code assigned to each of them, as well as their authors, titles and scientific journals where they were published.

Table 6: Selected studies

Code	Author	Tittle	Journal
	(Valdés Cuervo et	Scientific Skills in Graduate Mexican Students: Curriculum,	International Journal of Higher
1	al., 2016)	Mentoring and Institutional Support	Education
	(Ossai 2016)	Relationship between Students' Scores on Research Methods and	Journal of Education and
2	(Ossai, 2010)	Statistics, and Undergraduate Project Scores	Practice
3	(Elliot et al., 2017)	Capturing visual metaphors and tales: innovative or elusive?	International Journal of Research and Method in Education
4	(Quintanilha, 2017)	Inovação pedagógica universitária mediada pelo Facebook e YouTube: uma experiência de ensino-aprendizagem direcionado à geração-Z	Educar Em Revista
5	(Yang & R. Smith, 2017)	Research support-oriented MATLAB learning: tackling difficult concepts and promoting personalised learning	New Directions in the Teaching of Physical Sciences
6	(Petrova, 2018)	Video blogging as an innovative form of the project activity in foreign language teaching to journalism students	Obrazovanie i Nauka
7	(Strokova, 2018)	Building research competence of PhD students: An analysis of experience of a PhD school	Obrazovanie i Nauka
8	(Yousefi et al., 2019)	Factors Affecting Iranian TEFL Postgraduate Candidates' Research Productivity: A Qualitative Study	International Journal of Education and Literacy Studies
9	(Limeri et al., 2019)	Volunteered or Voluntold? The Motivations and Perceived Outcomes of Graduate and Postdoctoral Mentors of Undergraduate Researchers	CBE Life Sciences Education
10	(Davydova et al., 2019)	Problem of perception of classical music by students of higher education institutions and its methodological solution	Humanities and Social Sciences Reviews
11	(Shafranov-Kutsev & Efimova, 2019)	The place of professional education system in formation of graduates' competitiveness	Obrazovanie i Nauka
12	(Davies & Wilson, 2020)	The value of pedagogical preferences: A case of personality and learning environments in higher education	International Journal of Educational Psychology
13	(Tight, 2020)	Higher education: discipline or field of study?	Tertiary Education and Management
14	(Efremenko et al., 2020)	Case method in vocational training for future specialists of culture and art	Universal Journal of Educational Research
15	(Barbosa de Lira et al., 2020)	Development and evaluation of a prototype-application for caregivers of elderly	Enfermeria Global
16	(Alenezi, 2020)	The relationship of students' emotional intelligence and the level of their readiness for online education: A contextual study on the example of university training in Saudi Arabia	Obrazovanie i Nauka
17	(Birney et al., 2021)	A Case Study of Undergraduate and Graduate Student Research in STEM Education	Journal of Curriculum and Teaching
18	(Gin et al., 2021)	An exploration across institution types of undergraduate life sciences student decisions to stay in or leave an academic-year research experience	CBE Life Sciences Education
19	(Navarro et al., 2021)	Science Writing in Higher Education: Effects of Teaching Self- Assessment of Scientific Poster Construction on Writing Quality and Academic Achievement	International Journal of Science and Mathematics Education
20	(Boychuk et al., 2021)	The impact of the academic advising style on the development of an academic integrity culture among future PhD candidates	International Journal of Learning, Teaching and Educational Research

3.2 Geographical areas where studies were conducted

The countries from which the information was collected in the 20 selected scientific articles were identified. These include evidence from Russia (5), United Kingdom (4), United States (3), Brazil (2), Mexico (1), Nigeria (1), Saudi Arabia (1), Chile (1), Iran (1), and Ukraine, as seen in Table 7 and Figure 2.

Table 7: Geographical areas where studies were conducted

Code	Author (year)	Country
1	(Valdés Cuervo et al., 2016)	Mexico
2	(Ossai, 2016)	Nigeria

Code	Author (year)	Country
3	(Elliot et al., 2017)	United Kingdom
4	(Quintanilha, 2017)	Brazil
5	(Yang & R. Smith, 2017)	United Kingdom
6	(Petrova, 2018)	Russia
7	(Strokova, 2018)	Russia
8	(Yousefi et al., 2019)	Iran
9	(Limeri et al., 2019)	United States
10	(Davydova et al., 2019)	Russia
11	(Shafranov-Kutsev & Efimova, 2019)	Russia
12	(Davies & Wilson, 2020)	United Kingdom
13	(Tight, 2020)	United Kingdom
14	(Efremenko et al., 2020)	Russia
15	(Barbosa de Lira et al., 2020)	Brazil
16	(Alenezi, 2020)	Saudi Arabia
17	(Birney et al., 2021)	United States
18	(Gin et al., 2021)	United States
19	(Navarro et al., 2021)	Chile
20	(Boychuk et al., 2021)	Ukraine



Figure 2: Geographical areas where studies were conducted

3.3 The process of university teaching in scientific research

According to the northern question, how is scientific research being taught in universities, four dimensions were established. The first dimension was pedagogical research, which describes the nature of the research that can be quantitative, qualitative or mixed (Table 8). The second dimension analysed was the complexity of teaching, which involves the difficulties in teaching, the difficulty in developing the research or the limitations they detected at the time of developing the research (Table 9). The third dimension was the techniques and instruments used (Table 10), and for the fourth dimension called predominance of teaching over research, the suggestions were analysed in some cases the conclusions that direct their gaze towards teaching or research (Table 11).

Table 8: Pedagogical research

Code	Pedagogigal research
1	Research with a quantitative approach, which established a relationship between research variables.
2	Research with a quantitative approach, ex post facto, which established a relationship between two
2	variables, end-of-degree project.
3	Qualitative research, with a phenomenological approach.
4	Research with qualitative approach, with the creation of a Facebook discussion group and the creation
4	of a YouTube channel.
-	Research with a quantitative approach, where a teaching module was applied. Evaluation through a
2	pre-test and post-test.
6	Research that was developed using hypothetical-deductive methods.
7	Research where scientific publications were analysed and then a questionnaire was applied.
8	Research with a qualitative approach that studies the motivations that lead to the realization of their
0	research. The design used was intra-subject.
9	Exploratory study, based on the experiences of postgraduate mentors.
10	Study that describes axiological, subjective-human, ethical aspects, based on observation and
10	experience.
11	Research with a theoretical approach, complementing the research with quantitative data.
12	Research with quantitative approach, correlational level.
13	Qualitative research, with phenomenological approach.
14	Qualitative research - case studies
15	Research with quantitative approach, descriptive and exploratory.
16	Quantitative research, relational level
17	Research with qualitative approach, case study.
19	Quantitative approach, using a questionnaire that investigates: socio-demographic profile, level of
10	experience of the students in relation to the research.
19	Research with quantitative approach
20	General empirical scientific methods of analysis were used, i.e., an experiment with qualitative and
20	quantitative analysis was conducted

Table 8 shows the nature of the research conducted in twenty articles from three databases: Eric, Scielo and Scopus.

Code 1 article is a research with a qualitative approach, where the design was phenomenological whose main objective was to investigate, understand conceptions and the pedagogical, sociocultural and psychological challenges that students usually encounter (Elliott et al., 2017). Likewise, another research is presented where the success of the insertion of virtual technologies for the teachinglearning process of young university students was evaluated (Quintanilha, 2017). Also, a research is presented where hypothetical-deductive methods were used, because it raised to consider video blogging as an innovative way of learning and another research that raises the use of posters and that in it ethnographic tools are considered (Navarro et al., 2021; Petrova, 2018). Another research in the table shows research that analyses the motivations that enable research, this information was obtained from postgraduate candidates (Yousefi et al., 2019). An exploratory study research of 32 postgraduate mentors is visualized too (Limeri et al., 2019). Also, a research is presented whose aim was to find a solution to the problem of perception of classical music by students trained in the musical and pedagogical field (Davydova et al., 2019). Like theories and concepts, higher education researchers tend to predominantly use the usual research methods in the social sciences, such as interviews, surveys, and documentary analysis (Tight, 2020). Another research shown is case study in training in the specialty of Folk Art Culture, in this research scientific literature and pedagogical experience were analysed and another case study that aimed to provide faculty and research teams with ideas based on their own experience as research mentors (Birney et al., 2021; Efremenko et al., 2020).

Likewise, articles with a quantitative approach, where the relationship between variables is

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measured (Alenezi, 2020; Barbosa de Lira et al., 2020; Davies & Wilson, 2020; Valdés Cuervo et al., 2016). Likewise, those where the research was analysed after the fact i.e. an ex post facto design (Ossai, 2016), a quasi-experimental design is also observed, since a module was applied which was evaluated before and after its application (Yang & R. Smith, 2017). Also another research where a questionnaire was applied but which evaluated the sociodemographic profile, level of experience of the students related to the research (Gin et al., 2021). Another research where the aim was to identify the level of research skills of doctoral students of pedagogical specialization (Strokova, 2018). Finally, a research is presented where two 90-minute workshops focused on self-evaluation of scientific poster writing were developed, and for the analysis, permutation ANOVA was applied quantitatively determining the divergence between groups (Navarro et al., 2021).

Finally, researches with mixed approach are shown, where contents were analysed, qualitative part and then the application of a questionnaire for the quantitative part, the aim was to judge scientifically the aspects of the modern professional educational system (Shafranov-Kutsev & Efimova, 2019). Finally, a research where the aim was to study the impact of academic advising style on the level of academic integrity of graduate students with higher efficiency (Boychuk et al., 2021).

The results obtained on the complexity of teaching dimension are described in Table 9.

Table 9: Complexity of teaching

Code	Complexity of teaching
	It does not mention the complexity in teaching, but in the final considerations it indicates that the research has certain
1	restrictions since it collects quantitative data, and that it is necessary to explain why they obtained those answers.
	There is an inadequate command of Research Methods and Statistics, as well as the attitude of the students towards
2	academic work and that some of the problems of writing undergraduate projects are the quality of the students.
2	Finally, the professors who supervised the projects had to make an extra effort for the students to succeed in writing
	the projects.
	He mentions that when the study is complex, this type of visual research with an adequate methodology is required
2	since seeking a retrospective view of the participant's leads to memory failures that can generate erratic and unreliable
2	findings. The use of visual methods and metaphors is appropriate, solid and decisive to generate richer, deeper and
	more meaningful data. The research encourages critical thinking by participants.
4	Pedagogical innovations should be explored, analysed and disseminated, so that teachers can overcome the use of
т	technology in comparison to generation Z.
	The authors compare the complexity of knowledge as the difference between an experienced driver and a novice
5	driver. However, the research focused on strengthening concepts and procedures that considered a concept called as
	problematic.
6	In the results and scientific novelty, it is necessary to develop methodological criteria and educational standards that
-	regulate video blogging as a form of teaching and methodological work.
7	The results and scientific novelty reveal unstable components in research competence: inability to use the most
,	important elements of the methodological corpus and problems in writing scientific texts.
	From the findings it is clear that the development of research performance is a complicated activity. The interviewees
8	were mostly negative about their in-depth knowledge of their field, their research training and networking with other
	research experts and research plans.
9	Postgraduates expressed doubts about mentoring, including concerns about time, effort, and lack of personal interest.
	For students of higher education institutions, original artistic language and innovative (non-traditional) means of
10	expression, serious conceptual component and emotional intensity of sounds, unusual instruments and intricate
	forms: complicate the process of perception of contemporary classical music and demonstrate the need for new
	peudgogical technologies.
	The educational system is forced to reconstruct usen in order to prepare possessors of complex knowledge and skins,
ш	the learning process
	They sugget durational psychologists to investigate pedagogical preferences and psychosocial variables. Likewise, on
12	They suggest educational psychologists to investigate pedagogical preferences and psychosocial variables. Elkewise, of
12	tracket them seem complex without there being complexity.
13	It have the send where where the the students did not show sufficient interest in the tonics of the professional
14	in the conclusions the authors where that the students due not show sufficient merics in the topics of the professional unit tasks horing and unself for presenting information, and they found the tasks horing and unself for a starting and unself for the tasks horing and the start horing and the tasks horing and tasks and tas
	to the students they did not stimulate self-training and research activities
15	The difficulties of this study were found at the time of the evaluation of the prototype
1)	In the chanter discussion it is written that students are not very aware of their educational needs and of the new
16	in the chapter discussion it is written that students are not very aware of their educational needs and of the new pedagogical tools to improve their learning experience
	pedagogical tools to improve their rearring experience.

17	The competence of the teacher to listen, organize and structure the research idea outlined in the students' arguments should be emphasized. Subsequently, support the student when the theoretical and methodological bases, as well as the analysis procedures. Adopt a position of advisor and tutor. However, leaving the decisions and responsibility with the future researcher. Prepare the student to answer their own questions in the course of research, in a collaborative dynamic, areas of science and mathematics.
18	It is important to share that the researcher's path involves challenges, insecurities, updates and also difficulties. Therefore, many students may give up when encountering initial barriers. For those who wish to get started in academic activities, guidance on opportunities, research areas and academic-professional development.
19	The faculty complained about the student posters, which lacked critical features of a scientific product, which were explicitly included in the course rubric. It was also clear that the student body did not use the analytical rubrics because they considered them complex.
20	The study was complex, since it involved two pedagogical categories and their relationship. The experimental work was conducted only for second-year graduate students, the study did not take into account the work experience of the academic advisors and the limited time allotted for the experiment

Table 9 describes the difficulties described in the articles; some have been placed in the results section, others in the limitations. The difficulties have been grouped into three aspects: The student body, the teaching staff or the research process itself.

Regarding the students, it is highlighted that they do not fulfil their assigned tasks, suffer from lack of interest or have inadequate attitudes towards research (Alenezi, 2020; Efremenko et al., 2020; Limeri et al., 2019; Navarro et al., 2021; Ossai, 2016). In relation to the teaching staff, the need to develop competencies, posture and counselling is mentioned (Birney et al., 2021; Gin et al., 2021). Finally, in the research process, the restrictions that one has at the time of collecting the information are written, being necessary the establishment of innovative strategies (Barbosa de Lira et al., 2020; Boychuk et al., 2021; Davydova et al., 2019; Elliot et al., 2017; Petrova, 2018; Quintanilha, 2017; Shafranov-Kutsev & Efimova, 2019; Strokova, 2018; Tight, 2020; Valdés Cuervo et al., 2016; Yang & R. Smith, 2017; Yousefi et al., 2019).

Table 10 describes the techniques and instruments used in the collection of data or evidence for the research.

Code	Techniques and instruments used		
1	Questionnaires		
2	2 Project evaluation forms to grade students on their projects at the end of the program.		
2	Semi-structured interviews about academic and non-academic experiences. Visual data to		
3	complement narrative evidence.		
4	Semi-structured questionnaires.		
5	A questionnaire, a learning module that complemented the intervention and interviews.		
6	Scientific method: analysed, synthesized, concretized and generalized the structure of video blogging.		
7	Questionnaires, one online and one to doctoral students.		
8 Interviews			
9 Snowball technique			
10 Method of musical and creative projects			
11	Questionnaire and content analysis.		
12	Questionnaires		
13	Interviews, surveys and documentary analysis.		
14	In the diagnostic stage, a survey was conducted.		
15 In the training phase of the experiment, specific case studies were developed.			
16	Methodology case studies, analysis of literature and pedagogical experience, and then a control		
10	experiment including a new survey was conducted.		
17	Questionnaire on an individual basis and content validation by judges.		
18	Questionnaire		
19	Case study, conducting an interview with an undergraduate and a graduate student.		
20	Questionnaire for the collection of information		

Table 10: Techniques and instruments used

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Table 10 shows how evidence is collected for research development, thus grouped into:

- a. Research that employed closed questionnaires (Alenezi, 2020; Barbosa de Lira et al., 2020; Boychuk et al., 2021; Davies & Wilson, 2020; Strokova, 2018; Valdés Cuervo et al., 2016), semi-structured questionnaires (Quintanilha, 2017), questionnaires and modules (Shafranov-Kutsev & Efimova, 2019; Yang & R. Smith, 2017), forms (Ossai, 2016), and structured or semi-structured interviews (Elliot et al., 2017; Yousefi et al., 2019).
- b. Research describing interviews, surveys and documentary analysis (Birney et al., 2021; Efremenko et al., 2020; Tight, 2020). Also, others are described such as the use of blogging (Petrova, 2018), snowballing, musical and creative projects (Davydova et al., 2019; Limeri et al., 2019), and poster creation (Navarro et al., 2021).

Table 11 describes the predominance of teaching over research, such information was extracted from the conclusions and suggestions section.

Table 11: Predominance of teaching over research

Code	Predominance of teaching over research
1	The authors recommend the coordination of educational actors and program objectives through explicit activities that
1	are synergistic to synchronize and focus the efforts of both students and teachers.
	It was identified that students have a negative attitude towards tests, the researcher recommends further study in
2	Research Methods and Statistics.
2	The research suggests that visual metaphors have their share of challenges and thus earn a reputation for being
3	"slippery." They suggest that "novel" situations should be applied on visual metaphors.
4	The research provided qualitative and quantitative results directed to teaching and the use of digital tools.
5	The conclusions show that there is a strong and effective relationship between teaching and research.
6	The scientific novelty suggests the development of methodological criteria and educational standards that regulate
0	video blogging as a form of teaching and methodological work.
	It is proved insufficient competence of many doctoral students to organize and carry out an independent scientific and
7	pedagogical arc, systemic scientific-pedagogical work will help to achieve significant improvement in building the
	competence of doctoral students for scientific and teaching activities.
8	It is necessary to extend the research to a larger number of participants.
9	The authors propose a model of graduate mentoring for undergraduate researchers.
	The task of teachers is to use classical music in the process of professional preparation of teacher-musicians as carriers
10	of social and cultural values, this strategy poses the education of the young generation based on traditions, cultural
	and spiritual values of the world. New pedagogical technologies are necessary.
11	In the paragraph of practical importance they write that the research conducted enriches the sociological theory with
11	new knowledge about the competitiveness of young people.
12	In the conclusions they state the usefulness of investigating student preferences to improve the quality of learning.
13	Higher education studies make only limited use of specialized research terminology.
	The role of the educator applying the case method is not only to prepare a set of materials and coordinate the process
14	of developing students' knowledge and practical skills. The educator synthesizes the functions of education,
	organization and management of research.
15	For the development of the prototype, a literature review was conducted to identify, interpret and understand the
.)	problems.
16	The research opens the possibility of improvising pedagogical strategies to instil equity in the educational awareness of
10	students so that learning objectives can be achieved in a real sense.
	The recommendations highlight the competence and ability of tutors to listen to students' demands, interests and
17	needs, as well as to adopt a collaborative process. The student's interest, enthusiasm and investment in their career
<i>'</i>	research. However, the integration of undergraduate and graduate students reinforces the actions between these two
	spaces of the university, and the benefits for the knowledge of the careers they have chosen.
	The recommendations highlight: (a) providing a degree of accompaniment and availability, with some regularity,
	responding to doubts and insecurities; (b) explaining what is being done (laboratory or otherwise) to carry out the
18	research and now this knowledge can be used in different life situations, even if it is a small task linked to research; (c)
	being fiexible, allowing the students to follow their own pace and respecting their individuality; (d) if there is funding
	or scholarship, pay students for the task developed; (e) establish a pleasant and positive environment for collaborative
10	WUIK.
19	In the conclusions, the address recommend number are search using ethnographic tools.
20	The autions recommend conducting this type of research at the higher education level since the results obtained will be useful for other recovery
	be useful for other research.

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Table 11 describes where the research process is usually focused. When referring to teaching, they recommend coordinating among educational actors (Valdés Cuervo et al., 2016), creating novel situations (Elliot et al., 2017), using digital tools (Quintanilha, 2017), developing methodological criteria (Petrova, 2018), developing tutorial model proposals (Limeri et al., 2019), the competence or capacity of tutors to listen to students, being flexible, providing accompaniment and availability (Birney et al., 2021; Gin et al., 2021), develop strategies of new pedagogical technologies (Davydova et al., 2019), use of research terms (Tight, 2020), develop knowledge, skills, pedagogical practices (Efremenko et al., 2020), improvise new pedagogical strategies (Barbosa de Lira et al., 2020).

If they refer to research, they suggest deepening research methods (Ossai, 2016), extending research to a larger number of participants (Yousefi et al., 2019), providing new knowledge (Shafranov-Kutsev & Efimova, 2019), identifying, interpreting and understanding problems (Barbosa de Lira et al., 2020) inserting ethnographic tools to conduct other research (Navarro et al., 2021), and replicating research (Navarro et al., 2021).

Finally, there is a third group that considers that both are related (Yang & R. Smith, 2017), being necessary a significant improvement between scientific activities and teaching (Strokova, 2018).

4. Discussion and Conclusions

University professors should be aware that despite having extensive professional experience, they must improve their research skills in order to develop research products. Theoretical basis and scientific methodology are important for the construction of knowledge and the solution of society's problems. Globalization is leading research along a path with an economic, social, technological and labor insertion approach, leaving aside the promotion of theoretical research (Cataño, 1980; Martínez Ibarra & Massón Cruz, 2021), as opposed to those authors who suggest that in scientific research there should be a link between the university and the company (Gomara et al., 2021).

Pedagogical researches with diverse approaches are sources of knowledge. Hence, the responsibility falls on the university faculty that researches and complies with scientific processes, leaving aside radical positions, beliefs and interests that distort the existing reality. There should be no criteria to mention that one approach is superior to the other, since everything depends on the rigor and methodological quality developed by the researcher (Sánchez Flores, 2019), whatever the discipline or subject to be taught (Parra León & León Palencia, 2021).

In relation to the complexity of teaching dimension, it is known that the human being investigates by nature, therefore, it is necessary to put aside the thought that when students investigate or develop a scientific product they are facing an extraordinary and unattainable fact (Rojas Ulloa, 2021). In most articles published by Latin American authors, there is generally no evidence of the section on difficulties or limitations, which may be methodological or those of the researcher. Difficulties, complications or limitations need to be written and conceived as an opportunity for subsequent scientific research (Avello Martínez et al., 2019; Valenzuela, 2021). They can arise from the student body, from the university faculty doing the research or from the methodological process itself. University students perceive that they lack sufficient knowledge in methodology, writing, and information search, key elements to start a research project. Likewise, motivation, teacher's advice among other factors are necessary to obtain the university thesis (Castro-Rodríguez & Lara-Verástegui, 2021; Castro Rodríguez et al., 2018). From the findings, it is evident the difficulties that university professors have, among them the competencies, critical thinking and the time they provide for counseling, these agree with authors who conceive that the time provided to students should be of quality, absorbing all possible doubts (Ishiyama-Cervantes, 2020; Urrea Zazueta & Grijalva Verdugo, 2020).

For the dimension use of techniques and instruments, the findings indicate two marked positions; questionnaires and interviews, for the collection of scientific evidence that respond to the research approaches. But, it is necessary to highlight the presence of other researches that collect evidence through other means such as the use of blogging, music projects, creation of posters, marking a clear difference in obtaining data for research, strengthening knowledge and thus exploring a specific topic (Parra Bernal & Agudelo Marín, 2020; Villalobos García et al., 2021).

Finally, in the dimension of predominance of teaching over research, it is evident that the authors of the articles suggest listening to the students, guiding them, doing tutorial work, using teaching strategies, a position in agreement with Ishiyama-Cervantes (2020). Use technological tools as opposed to authors who suggest that to strengthen research it is necessary for students to participate in postgraduate advanced studies (Newman, 2020) or to be members of research groups (Chuico Pardo et al., 2021) or to participate in collaborative projects (Meyer et al., 2018).

In order to strengthen the teaching of scientific research at the university level, it is necessary that the faculty describe the scientific process and discuss with the students the importance of each process and the difficulties that may be encountered, due to their experience in research.

Also, it should be strengthened through readings of scientific articles that belong to scientific journals indexed in recognized databases, these readings will strengthen the development of their critical thinking, and have solidity when discussing a specific topic. Consequently, students will have the opportunity to choose the type of research to develop, before the imposition of teachers who develop a single approach or believe they are specialists in one area.

The complexity of research teaching falls directly on the teacher, since he/she must develop various methodological strategies to ensure that the students complete the activities, awaken interest in the topic to be investigated and discuss inappropriate attitudes if they arise. Consequently, the teacher's experience plays a preponderant role in this stage, perhaps leaving aside the radical postures and providing the corresponding advice in the established times.

The techniques and instruments that were developed in a physical way, for pandemic reasons are being collected in a virtual way. In this case, the various technological tools offered by the web can be used, whether for quantitative, qualitative or mixed approaches. Without leaving aside that every research process goes through the ethical concept of the researchers, in this case of the student supervised by university professors who handle technological tools, concluding that it is not only the experience in research, but also the permanent updating of the teaching staff to remain at the forefront.

Finally, university professors, whatever the discipline they develop, research, read, analyse, synthesize and present to the class the findings of the subject. In other words, they develop the research process. They may not fulfil all the processes involved in scientific research, but they do research. The difficulty lies in transferring the process to the students, since this is a process of experience and methodology.

We suggest that each university professor create scientific contact networks to strengthen their knowledge in research, using the available institutional agreements. We also recommend the promotion of the integration of university students in research groups from early university stages.

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References

- Albats, E., Bogers, M., & Podmetina, D. (2020). Companies' human capital for university partnerships: A microfoundational perspective. *Technological Forecasting and Social Change*, 157, 120085. https://doi.org/10.1016/j. techfore.2020.120085
- Alenezi, A. M. (2020). The relationship of students' emotional intelligence and the level of their readiness for online education: A contextual study on the example of university training in Saudi Arabia. *Obrazovanie i Nauka*, 22(4), 89–109. https://doi.org/10.17853/1994-5639-2020-4-89-109

- Alexander, J. O. (2003). Library Applications. In Encyclopedia of Information Systems (pp. 55-76). Elsevier. https://doi.org/10.1016/B0-12-227240-4/00104-0
- Amézquita Amésquita, M. J., Ávila, D. P., Quispe Condori, A. F., & García, M. S. (2020). La investigación científica en la universidad peruana. *Journal of the Academy*, 3, 32–39. https://doi.org/10.47058/joa3.3
- Aslan, A. (2021). Problem- based learning in live online classes: Learning achievement, problem-solving skill, communication skill, and interaction. *Computers & Education*, 171, 104237. https://doi.org/10.1016/j.compedu.2021.104237
- Avello Martínez, R., Rodríguez Monteagudo, M., Rodríguez Monteagudo, P., Sosa López, D., Companioni Turiño, B., & Rodríguez Cubela, R. L. (2019). ¿Por qué enunciar las limitaciones del estudio? *Medisur: Revista de Ciencias Médicas de Cienfuegos*, 17(1), 10–12. http://www.medisur.sld.cu/index.php/medisur/article/view/4 126
- Baas, J., Schotten, M., Plume, A., Côté, G., & Karimi, R. (2020). Scopus as a curated, high-quality bibliometric data source for academic research in quantitative science studies. *Quantitative Science Studies*, 1(1), 377–386. https://doi.org/10.1162/qss_a_00019
- Balbo, J. (2020). Formación en investigación pedagógica y enseñanza reflexiva en la educación universitaria. *Educere*, 24(78), 309–322. http://erevistas.saber.ula.ve/index.php/educere/article/view/16041
- Barbosa de Lira, T., Viana Rocha, F. C., Pinheiro Landim Almeida, C. A., Miranda Amorim, F. C., & Viana Rocha, L. P. (2020). Development and evaluation of a prototype-application for caregivers of elderly. *Enfermeria Global*, 19(3), 389–421. https://doi.org/10.6018/eglobal.396671
- Barnes, N., Fives, H., Mabrouk-Hattab, S., & SaizdeLaMora, K. (2020). Teachers' epistemic cognition in situ: Evidence from classroom assessment. *Contemporary Educational Psychology*, 60, 101837. https://doi.org/10. 1016/j.cedpsych.2020.101837
- Becerra-Rodríguez, D. F., Barreto-Tovar, C. H., Bernal-Torres, C. A., & Ordoñez, A. F. (2021). Lectura grupal e infografías en la enseñanza y el aprendizaje de contenidos de divulgación científica en el contexto universitario. *Formación Universitaria*, *14*(2), 47–56. https://doi.org/10.4067/s0718-50062021000200047
- Birney, L. B., Evans, B. R., Kong, J., Solanki, V., Mojica, E.-R., Kondapuram, G., & Kaoutzanis, D. (2021). A Case Study of Undergraduate and Graduate Student Research in STEM Education. *Journal of Curriculum and Teaching*, 10(1), 29. https://doi.org/10.5430/jct.v1011p29
- Boychuk, P. M., Fast, O. L., Shevchuk, O. P., Horobets, T. V., & Shkoba, V. A. (2021). The impact of the academic advising style on the development of an academic integrity culture among future PhD candidates. *International Journal of Learning, Teaching and Educational Research*, 20(4), 302-319. https://doi.org/10.26803/ijlter.20.4.16
- Brennan, L., Cusack, T., Delahunt, E., Kuznesof, S., & Donnelly, S. (2019). Academics' conceptualisations of the research-teaching nexus in a research-intensive Irish university: A dynamic framework for growth & amp; development. *Learning and Instruction*, 60, 301–309. https://doi.org/10.1016/j.learninstruc.2017.10.005
- Castro-Rodríguez, Y., & Lara-Verástegui, R. (2021). Experiencias y percepciones de los graduados de Odontología sobre la culminación de la tesis en una universidad del Perú. *Odontología Sanmarquina*, 24(3), 235–241. https://doi.org/10.15381/0S.V24i3.20715
- Castro Rodríguez, Y., Sihuay-Torres, K., & Perez-Jiménez, V. (2018). Producción científica y percepción de la investigación por estudiantes de odontología. *Educacion Medica*, 19(1), 19–22. https://doi.org/10.1016/j.edumed.2016.11.001
- Cataño, G. (1980). Sociología de la educación en Colombia (I). Revista Colombiana de Educación, 5(5), 65-66. https://doi.org/10.17227/01203916.5034
- Chuico Pardo, J. P., Bósquez Remache, J. D., & Campaña Muñoz, L. C. (2021). Importancia de la participación estudiantil en la investigación universitaria sobre la ley de mediación. *Revista Conrado*, 17(79), 107-113. https://conrado.ucf.edu.cu/index.php/conrado/article/view/1702
- Cortés-Sánchez, J. D. (2016). Eficiencia en el uso de bases de datos digitales para la producción científica en universidades de Colombia. *Revista Española de Documentación Científica*, 39(2). https://doi.org/10.3989/redc.2016.2.1320
- Cruz Mosquera, F. E., Naranjo Rojas, A., Moreno Reyes, S. P., Arango Arango, A. C., Ávila Ovalle, I., Perlaza, C. L., Satizabal Mallama, B. S., & Salas, J. A. (2021). Publicación de tesis sustentadas en un pregrado de ciencias de la salud de una universidad colombiana, 2012-2017. Prevalencia y factores relacionados. *Educación Médica*, 22, 185–190. https://doi.org/10.1016/j.edumed.2019.11.006
- Daumiller, M., & Dresel, M. (2020). Teaching and research: Specificity and congruence of university faculty achievement goals. *International Journal of Educational Research*, *99*, 101460. https://doi.org/10.101 6/j.ijer.2019.08.002

- Davies, J. L., & Wilson, T. L. (2020). The value of pedagogical preferences: A case of personality and learning environments in higher education. *International Journal of Educational Psychology*, *9*(3), 269–289. https://doi.org/10.17583/ijep.2020.5634
- Davydova, A. A., Morozova, E. A., Orekhova, O. G., Smirnov, A. V., & Efremenko, A. P. (2019). Problem of perception of classical music by students of higher education institutions and its methodological solution. *Humanities and Social Sciences Reviews*, 7(6), 714–717. https://doi.org/10.18510/hssr.2019.76106
- De-Moya-Anegón, F., Herrán-Páez, E., Bustos-González, A., Corera-Álvarez, E., Tibaná-Herrera, G., & Rivadeneyra, F. (2020). Ranking iberoamericano de instituciones de educación superior 2020 (SIR Iber). In *Ediciones Profesionales de la Información*. https://doi.org/10.3145/sir-iber-2020
- Domínguez Romero, E., & Bobkina, J. (2021). Exploring critical and visual literacy needs in digital learning environments: The use of memes in the EFL/ESL university classroom. *Thinking Skills and Creativity*, 40, 100783. https://doi.org/10.1016/j.tsc.2020.100783
- Duque-Cardona, V., & Largo-Taborda, W. A. (2021). Desarrollo de las competencias científicas mediante la implementación del aprendizaje basado en problemas (ABP) en los estudiantes de grado quinto del instituto universitario de Caldas (Manizales). *Panorama*, 15(28), 143–156. https://doi.org/10.15765/pnrm.v15i28.1821
- Efremenko, A. P., Berezhnoy, D. A., Tsilinko, A. P., Lomakina, T. A., & Solovey, A. I. (2020). Case method in vocational training for future specialists of culture and art. *Universal Journal of Educational Research*, 8(9), 3793–3798. https://doi.org/10.13189/ujer.2020.080901
- Elliot, D. L., Reid, K., & Baumfield, V. (2017). Capturing visual metaphors and tales: innovative or elusive? International Journal of Research and Method in Education, 40(5), 480-496. https://doi.org/10.1080/17437 27X.2016.1181164
- Elliott, J. H., Synnot, A., Turner, T., Simmonds, M., Akl, E. A., McDonald, S., Salanti, G., Meerpohl, J., MacLehose, H., Hilton, J., Tovey, D., Shemilt, I., Thomas, J., Agoritsas, T., Perron, C., Hodder, R., Pestridge, C., Albrecht, L., Horsley, T., ... Pearson, L. (2017). Living systematic review: 1. Introduction—the why, what, when, and how. *Journal of Clinical Epidemiology*, *91*, 23–30. https://doi.org/10.1016/j.jclinepi.2017.08.010
- Esteves Pairazamán, A. T., Fernández Bedoya, V. H., Ibarra Fretell, W. G., & Grijalva Salazar, R. V. (2020). Tutoring for the development of the assertiveness of elementary school students in Trujillo, Peru. International Journal of Scientific and Technology Research, 9(2), 4500–4505. https://www.ijstr.org/finalprint/feb2020/Tutoring-For-The-Development-Of-The-Assertiveness-Of-Elementary-School-Students-In-Trujillo-Peru.pdf
- Ferguson, S., & Hebels, R. (2003). Generic data management software. In *Computers for Librarians* (pp. 143–166). Elsevier. https://doi.org/10.1016/B978-1-876938-60-4.50011-2
- Ferreira, C. M., & Serpa, S. (2020). Photography in Social Science Research. Journal of Educational and Social Research, 10(4), 62. https://doi.org/10.36941/jesr-2020-0065
- Galera Núñez, M. del M., & Pérez Ceballos, J. (2017). La investigación en Educación Musical en la base de datos ERIC. *Revista Electrónica de LEEME*, 22(22), 1–14.
- Gin, L. E., Clark, C. E., Elliott, D. B., Roderick, T. B., Scott, R. A., Arellano, D., Ramirez, D., Vargas, C., Velarde, K., Aeschliman, A., Avalle, S. T., Berkheimer, J., Campos, R., Gerbasi, M., Hughes, S., Roberts, J. A., White, Q. M., Wittekind, E., Zheng, Y., ... Brownell, S. E. (2021). An exploration across institution types of undergraduate life sciences student decisions to stay in or leave an academic-year research experience. *CBE Life Sciences Education*, 20(3), 1–14. https://doi.org/10.1187/cbe.21-04-0108
- Gomara, F. E., Concepción, D. N., Gonzáles, E., & Armas, A. (2021). La investigación científica en la formación del estudiante universitario mediante el vínculo universidad–empresa. *Revista Universidad y Sociedad*, 13(2), 383–388. https://rus.ucf.edu.cu/index.php/rus/article/view/1977
- Gougoulakis, P., Kedraka, K., Oikonomou, A., & Panagiotes, A. (2020). Teaching in Tertiary Education. *Academia*, 20(21), 101–137. https://doi.org/10.26220/aca.3443
- Guerra, M., & Zuccoli, F. (2014). Thesis Projects in Teacher Training: A Possibility for Research-training. *Procedia Social and Behavioral Sciences*, 116, 1971–1975. https://doi.org/10.1016/j.sbspr0.2014.01.505
- Hansson, S. O. (2014). Descriptor Revision. Studia Logica, 102(5), 955-980. https://doi.org/10.1007/511225-013-9512-5
- Hansson, S. O. (2019). Back to basics: Belief revision through direct selection. *Studia Logica*, 107(5), 887–915. https://doi.org/10.1007/s11225-018-9807-7
- Hein, J., Daumiller, M., Janke, S., Dresel, M., & Dickhäuser, O. (2019). How learning time mediates the impact of university Scholars' learning goals on professional learning in research and teaching. *Learning and Individual Differences*, 72, 15–25. https://doi.org/10.1016/j.lindif.2019.04.002
- Higuera-Ojito, V. H., Porto Solano, A. F., & Hurtado Penago, N. (2018). Revista Pensamiento Americano 2013-2016: Palabras clave y su presencia en el tesauro de la UNESCO. *Pensamiento Americano, 11*(21), 253-259. https://doi.org/10.21803/pensam.v11i21.165

- Ishiyama-Cervantes, R. (2020). Lo que se debe ofrecer al lector de un artículo científico. *Revista Experiencia En Medicina Del Hospital Regional Lambayeque*, 6(2), 101–102. https://doi.org/10.37065/rem.v6i2.468
- Ishiyama-Cervantes, R. (2021). Temas originales para investigar. *Revista Experiencia En Medicina Del Hospital Regional Lambayeque*, 7(2), 101–102. https://doi.org/10.37065/rem.v7i2.487.
- Ismayilova, K., & Klassen, R. M. (2019). Research and teaching self-efficacy of university faculty: Relations with job satisfaction. International Journal of Educational Research, 98, 55–66. https://doi.org/10.1016/j.ijer.2019. 08.012
- Ivanova, O., Gnatyshina, E., Uvarina, N., Korneeva, N., & Savchenkov, A. (2021). The wheel of science: A model for managing scientific activities in higher education as a factor in developing flexible skills of the youth in the region. *Thinking Skills and Creativity*, 42(July), 100928. https://doi.org/10.1016/j.tsc.2021.100928
- Jie, Z., Roslan, S., Muhamad, M. M., Md Khambari, M. N., & Zaremohzzabieh, Z. (2021). Mitigating Academic Boredom and Increasing Well-Being Among Chinese College Students Based on a Positive Education Approach. Journal of Educational and Social Research, 11(6), 91. https://doi.org/10.36941/jesr-2021-0131
- Kaviani, A., McKeown, K., & Eppard, J. (2021). Reflections on Teachers and Students' Views on Teaching and Learning Experiences at University: A Diary Study. Academic Journal of Interdisciplinary Studies, 10(1), 71. https://doi.org/10.36941/ajis-2021-0007
- Kitchenham, B. (2004). Procedures for performing systematic reviews. In *Procedures for performing systematic reviews*. Keele University.
- Kitchenham, B., Pretorius, R., Budgen, D., Pearl Brereton, O., Turner, M., Niazi, M., & Linkman, S. (2010). Systematic literature reviews in software engineering – A tertiary study. *Information and Software Technology*, 52(8), 792–805. https://doi.org/10.1016/j.infsof.2010.03.006
- Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P. A., Clarke, M., Devereaux, P. J., Kleijnen, J., & Moher, D. (2009). The PRISMA Statement for Reporting Systematic Reviews and Meta-Analyses of Studies That Evaluate Health Care Interventions: Explanation and Elaboration. *PLoS Medicine*, 6(7), e1000100. https://doi.org/10.1371/journal.pmed.1000100
- Limeri, L. B., Asif, M. Z., & Dolan, E. L. (2019). Volunteered or Voluntold? The Motivations and Perceived Outcomes of Graduate and Postdoctoral Mentors of Undergraduate Researchers. CBE Life Sciences Education, 18(2), ar13. https://doi.org/10.1187/cbe.18-10-0219
- Mamani-Benito, O. J., Tito-Betancur, M., Rodriguez-Alarcón, F., & Mejía, C. R. (2021). ¿Se publican las tesis sustentadas de psicología en el Perú? Un análisis de tres universidades mejor posicionadas en el ranking Scimago. *Propósitos y Representaciones*, 9(2). https://doi.org/10.20511/pyr2021.v9n2.1202
- Martínez Ibarra, O., & Massón Cruz, R. M. (2021). La pedagogía en Cuba: apuntes para una reflexión. *Praxis Pedagógica*, 21(0124-1494), 66–85. https://revistas.uniminuto.edu/index.php/praxis/article/view/2369
- Meyer, J., Pillei, M., Zimmermann, F., & Stöglehner, G. (2018). Customized education as a framework for strengthening collaboration between higher education institutions and regional actors in sustainable development-Lessons from Albania and Kosovo. Sustainability (Switzerland), 10(11). https://doi.org/10.33 90/su1013941
- Mnguni, L. (2021). Strategies for the Development and Application of Research Frameworks in Sciences Education Research. *Journal of Educational and Social Research*, 11(6), 1. https://doi.org/10.36941/jesr-2021-0123
- Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Medicine, 6(7), e1000097. https://doi.org/10.1371/jou rnal.pmed.1000097
- Mondino, G. M. (2021). Contribuciones para un análisis de la universidad desde el pensamiento complejo. *Enfoques*, 33(1), 41-63. https://publicaciones.uap.edu.ar/index.php/revistaenfoques/article/view/996
- Morin, E. (1999). Los siete saberes necesarios para la educación del futuro. In UNESCO. https://www.ideassonline.org/public/pdf/LosSieteSaberesNecesariosParaLaEdudelFuturo.pdf
- Navarro, F., Orlando, J., Vega-Retter, C., & Roth, A. D. (2021). Science Writing in Higher Education: Effects of Teaching Self-Assessment of Scientific Poster Construction on Writing Quality and Academic Achievement. *International Journal of Science and Mathematics Education*. https://doi.org/10.1007/S10763-020-10137-y
- Newman, C. B. (2020). Corporate Internships, Undergraduate Research, and Finances: Successful African American Engineers' Consideration of Immediate Workforce Entry or Graduate School. *Journal of STEM Education : Innovations and Research*, 21(1), 11–17. https://www.jstem.org/jstem/index.php/JSTEM/article/vie w/2383/2149
- Ñique, C., Tenorio Paz, C. P., Rodríguez Cruz, L. D., & Diaz Manchay, R. J. (2021). Características y producción científica de las investigaciones de una escuela de enfermería en Perú. Universitas Médica, 62(2). https://doi.org/10.11144/javeriana.umed62-2.cpci

- Odigwe, F. N., Bassey, B. A., & Owan, V. J. (2020). Data Management Practices and Educational Research Effectiveness of University Lecturers in South-South Nigeria. *Journal of Educational and Social Research*, 10(3), 24. https://doi.org/10.36941/jesr-2020-0042
- Olivares-Donoso, R., & González, C. (2019). Undergraduate Research or Research-Based Courses: Which Is Most Beneficial for Science Students? *Research in Science Education*, 49(1), 91–107. https://doi.org/10.1007/s11165-017-9616-4
- Ossai, P. A. U. (2016). Relationship between Students' Scores on Research Methods and Statistics, and Undergraduate Project Scores. *Journal of Education and Practice*, 7(8), 75–78. https://www.iiste.org/Journal s/index.php/JEP/article/view/29394
- Packer, A. L. (2014). The SciELO Model for electronic publishing and measuring of usage and impact of Latin American and Caribbean scientific journals. 2nd ICSU-UNESCO Int. Conference on Electronic Publishing in Science, UNESCO House, 9–12.
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *The BMJ*, 372, 2021. https://doi.org/10.1136/bmj.n71
- Parra Bernal, L. R., & Agudelo Marín, A. (2020). Acceso,democracia y comunidades virtuales. In R. Canales Reyes & C. Herrera Carvajal (Eds.), *CLACSO*.
- Parra León, G., & León Palencia, A. C. (2021). La precariedad de la pedagogía en Colombia. *Praxis Pedagógica*, 21, 22–45. https://doi.org/10.26620/uniminuto
- Petrova, M. V. (2018). Video blogging as an innovative form of the project activity in foreign language teaching to journalism students. *Obrazovanie i Nauka*, 20(3), 140–159. https://doi.org/10.17853/1994-5639-2018-3-140-159
- Prayoga, T., & Abraham, J. (2017). A psychological model explaining why we love or hate statistics. *Kasetsart Journal of Social Sciences*, 38(1), 1–8. https://doi.org/10.1016/j.kjss.2016.08.013
- Prokop, D. (2021). University entrepreneurial ecosystems and spinoff companies: Configurations, developments and outcomes. *Technovation*, 107, 102286. https://doi.org/10.1016/j.technovation.2021.102286
- Quintanilha, L. F. (2017). Inovação pedagógica universitária mediada pelo Facebook e YouTube: uma experiência de ensino-aprendizagem direcionado à geração-Z. *Educar Em Revista*, 65, 249–263. https://doi.org/10.1590/01 04-4060.50027
- Rachmawati, I., Kurniawati, E., & Anggraini, M. (2021). Student Scientific Publication at The Department of International Relations, UPN "Veteran" Yogyakarta: An Action Research. *Journal of Educational and Social Research*, 11(6), 117. https://doi.org/10.36941/jesr-2021-0133
- Ramírez Genovez, C. E. (2021). Acompañamiento como asesor académico en la construcción de documentos de titulación en estudiantes normalistas. *RAIN*, *1*, 284–287. https://fh.mdp.edu.ar/revistas/index.php/rain/a rticle/view/4868
- Rojas Herrera, W. (2021). La enseñanza-aprendizaje de la investigación bajo los nuevos paradigmas científicos. *Multi-Ensayos*, 7(14), 45-51. https://doi.org/10.5377/multiensayos.v7i14.12005
- Rojas Ulloa, M. (2021). Investigar o no investigar. Pautas para elaborar una tesis de Derecho. *Ius et Praxis*, 052, 339–354. https://doi.org/10.26439/iusetpraxis2021.no52.4959
- Sáez Alonso, R. (2017). La prioridad del método en la investigación pedagógica. *Revista Española de Pedagogía*, 75(267), 239–254.
- Sánchez Flores, F. A. (2019). Fundamentos Epistémicos de la Investigación Cualitativa y Cuantitativa: Consensos y Disensos. *Revista Digital de Investigación En Docencia Universitaria*, 13, 101–122. https://doi.org/10.19083/rid u.2019.644
- Sánchez, M. J., Fernández, M., & Díaz, J. C. (2021). Técnicas e instrumentos de recolección de información: análisis y procesamiento realizado por el investigador cualitativo. *Revista Científica UISRAEL*, 8(1), 107–121. https://doi.org/10.35290/rcui.v8n1.2021.400
- Scott, N. R. (1998). Strategy for Activating University Research. *Technological Forecasting and Social Change*, 57(3), 217–219. https://doi.org/10.1016/S0040-1625(97)00120-0
- Senseney, M., Koehl, E. D., & Nay, L. (2019). Collaboration, consultation, or transaction: Modes of team research in humanities scholarship and strategies for library engagement. *College and Research Libraries*, 80(6), 787– 804. https://doi.org/10.5860/crl.80.6.787
- Shafranov-Kutsev, G. F., & Efimova, G. Z. (2019). The place of professional education system in formation of graduates' competitiveness. *Obrazovanie i Nauka*, 21(4), 139–161. https://doi.org/10.17853/1994-5639-2019-4-139-161

Shaqra, R. K. Y. A. (2020). The Reality of Evaluation of Graduate Students for Scientific Research in Jordanian Public and Private Universities. *Journal of Educational and Social Research*, 10(1), 218. https://doi.org/10.3 6941/jesr-2020-0020

Strokova, T. A. (2018). Building research competence of PhD students: An analysis of experience of a PhD school. *Obrazovanie i Nauka*, 20(10), 9–30. https://doi.org/10.17853/1994-5639-2018-10-9-30

- Tesouro, M., & Puiggalí, J. (2015). La Relación entre la Docencia y la Investigación Según la Opinión del Profesorado Universitario. *Procedia - Social and Behavioral Sciences, 196*, 212–218. https://doi.org/10.1016/j.sb spr0.2015.07.031
- Tight, M. (2020). Higher education: discipline or field of study? *Tertiary Education and Management*, 26(4), 415–428. https://doi.org/10.1007/S11233-020-09060-2
- Toledano-Ayala, I. (2020). Reflexiones sobre la investigación cualitativa y cuantitativa. *Universidad Abierta*, *1*(1). https://revista.universidadabierta.edu.mx/2020/12/30/reflexiones-sobre-investigacion-cualitativa-y-cuantitativa/
- Urrea Zazueta, M. L., & Grijalva Verdugo, A. A. (2020). Enseñar a investigar en la universidad. Desafíos desde la experiencia docente. In UNESCO.
- Våge, L., & Iselid, L. (2010). Professional news search services. In News Search, Blogs and Feeds (pp. 67-100). Elsevier. https://doi.org/10.1016/B978-1-84334-602-9.50003-4
- Valdés Cuervo, A. A., Sánchez Escobedo, P. A., Estévez Nenninger, E. H., & Aquino Zuñiga, S. P. (2016). Scientific Skills in Graduate Mexican Students: Curriculum, Mentoring and Institutional Support. International Journal of Higher Education, 5(3), 70–78. https://doi.org/10.5430/ijhe.v5n3p70
- Valenzuela, L. (2021). Aproximación a las principales dificultades para la elaboración de tesis de grado y el perfil del asesor. *Ciencia Latina Revista Multidisciplinar*, 5(5), 8360–8374. https://doi.org/10.37811/cl_rcm.v5i5.923
- Villafranqui Cabanillas, W. (2020). La investigación científica en el proceso de aprendizaje para la enseñanza: educación, sociedad y ciencia. *Revista Digital de Investigación En Docencia Universitaria*, 14(2), e1359. https://doi.org/10.19083/ridu.2020.1359
- Villalobos García, M., Marbán Prieto, J. M., & Anguita, J. (2021). Mapeo científico como técnica de investigación: puntos de corte en pruebas de evaluación educativa referidas a criterios como campo de conocimiento. *ReiDoCrea: Revista Electrónica de Investigación Docencia Creativa*, 10(33), 1–18. https://doi.org/10.308 27/digibug.70947
- Yang, C., & R. Smith, D. R. (2017). Research support-oriented MATLAB learning: tackling difficult concepts and promoting personalised learning. New Directions in the Teaching of Physical Sciences, 12(12), 1–6. https://doi.org/10.29311/ndtps.voi12.2402
- Yeo-Teh, N. S. L., & Tang, B. L. (2021). Research ethics courses as a vaccination against a toxic research environment or culture. *Research Ethics*, *17*(1), 55–65. https://doi.org/10.1177/1747016120926686
- Yepes-Nuñez, J. J., Urrútia, G., Romero-García, M., & Alonso-Fernández, S. (2021). Declaración PRISMA 2020: una guía actualizada para la publicación de revisiones sistemáticas. *Revista Española de Cardiología*, 74(9), 790– 799. https://doi.org/10.1016/j.recesp.2021.06.016
- Yousefi, R., Tahriri, A., & Tous, M. D. (2019). Factors Affecting Iranian TEFL Postgraduate Candidates' Research Productivity: A Qualitative Study. International Journal of Education and Literacy Studies, 7(2), 65. https://doi.org/10.7575/aiac.ijels.v.7n.2p.65
- Yuan, R., Yang, M., & Stapleton, P. (2020). Enhancing undergraduates' critical thinking through research engagement: A practitioner research approach. *Thinking Skills and Creativity*, 38, 100737. https://doi.org/10.1016/j.tsc.2020.100737
- Zhang, X., & Shi, W. (2019). Research about the university teaching performance evaluation under the data envelopment method. *Cognitive Systems Research*, *56*, 108–115. https://doi.org/10.1016/j.cogsys.2018.11.004
- Zhang, Y., Hou, Z., Yang, F., Yang, M. M., & Wang, Z. (2021). Discovering the evolution of resource-based theory: Science mapping based on bibliometric analysis. *Journal of Business Research*, 137, 500–516. https://doi.org/10.1016/j.jbusres.2021.08.055