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Like rocket science? Final paper in undergraduate teachers at uab and training of teachers-researchers

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Abstract

The study presented in this article is linked to the Ministry of Education's (MEC) national policy to improve teacher training, which, through decentralized projects and programs with Brazilian universities, especially public universities, has been implemented with incentives for inclusion of research activities related to the process of teacher education. In its theoretical field, the investigation is based on the reflective approach of authors and researchers who discuss the theme of teacher-researcher training. In the empirical field of research, references support the analysis and composition of data: (1) Partial Report of the National Scientific Training Group; (2) Scientific Initiation Pilot Project (2021), developed by the team at the Federal University of Maranhão (UFMA) within the scope of the Open University of Brazil (UAB); and, still, (3) answers to the questionnaire applied to the group of 42 students in the orientation and finalization phase of the End of Course Work (TFC). It is possible to understand that teaching-research, together with extension activities, represent academic stimuli that govern the functioning of all public universities, and in the case of UAB it is no different. Therefore, some of the main actions to encourage the UAB community have been intensified through the prospection of studies

and research, especially in the theoretical and practical field of an innovative concept for the formation of a professor-researcher, that is, the insertion of the research theme in Pedagogical projects for undergraduate courses is a requirement for improving training, mainly due to the strengthening and improvement of technological tools applied to education.

Key words: Teacher training. Scientific Training. Educational Policy. Open University of Brazil.

1. Initial considerations

The study proposed in this article is linked to the national policy carried out by the Ministry of Education (MEC), which, through decentralized projects and programs, together with Brazilian universities, mainly public institutions, implements improvements in the training of teachers of the education, specifically, by encouraging the inclusion of research activities in training activities.

Another important factor to be considered in the execution and development of the training policy discussed here is the current scenario of teachers' performance, as the set of difficulties linked to infrastructural and labor conditions is notorious, reasons that increase the need for permanent updating, aiming at the stability of the motivational factors that are essential for the teacher.

The Law on National Education Guidelines and Bases (LDB), Law no. 9,394, of December 20, 1996, in Article 43, clarifies higher education by determining the incentive for research work and scientific investigation in the training process. Therefore, this article seeks to broaden the discussion based on new evidence, such as the study developed based on a pilot project of scientific training for undergraduate students at UAB.

In the current moment of health and social crisis, in which some reflections on teacher training are intensified, it is important to resume the changes brought about by the new Resolution CNE/CP n. 2, of December 20, 2019, which presents, in the context that surrounds it, a group of professional competences, in which all teachers need to specialize in order to become capable of putting into practice not only the

ten general competences but also the provision of essential learning, with the purpose of guaranteeing to the students of licenciatura programs an innovative formation in the face of the challenges of today's world.

The article is developed around a problem-question: how to introduce the teacher-researcher concept in the UAB degrees, in order to reduce or eliminate the difficulties of students in the production of the final paper and, still, to achieve an innovative training from the perspective of research in practice?

Teaching, research and extension activities represent academic stimuli that govern the operation of public and private universities in Brazil, and UAB is no exception. The specialized literature confirms the importance of research in teacher education. In addition, analyzes by the authors of this article serve as a foundation, because they were based on the identification of weaknesses in the structure of curricula of undergraduate courses, disciplines related to research, teaching-learning means used in the discipline of Scientific Methodology, matrices (planning) of professors who work in the distance modality and a set of difficulties of graduating students, in relation to the elaboration and defense of the final paper.

In recent years, studies carried out in the management of the UAB, in the Coordination for the Improvement of Higher Education Personnel (CAPES), by means of specialists, indicate the need to stimulate the research theme in the pedagogical projects of distance courses, making this theme a requirement to improve training, mainly due to the strengthening and improvement of technological tools applied to education.

It should be noted that, in face-to-face teaching, the development achieved by research activities driven by scientific initiation programs, by research groups, individual and in groups, and by scientific events is already a reality, although the number of participants in these initiatives and in these events it does not reach 10% of the total number of students enrolled in public university courses. As an example of this, in the last Scientific Initiation Seminar (SEMIC) at UFMA, held in December 2020, the number of participants did not exceed 850, which represents

approximately 2.4% of the total of 35,332 students enrolled in the institution, according to 2019 data (XXXIII…, 2022)

This is a situation that should be considered as a warning signal to universities, in the sense that measures need to be taken with a view to raising the awareness of undergraduate students about research as a contributory basis for training. In on-site courses, participation in research activities is increasing every year, since there are already consolidated support programs, while in the distance learning modality and, in particular, in the UAB licensure courses, this activity is giving its first steps, as verified in the analyzed context.

In the list of the first initiatives, specifically those aimed at UAB students, in favor of the expansion of scientific initiation, the Pilot Project for Scientific Training emerged, resulting from the partnership between the Distance Education Board (DED) of CAPES and UFMA in six UAB On-site Support Poles in the state, located in the municipalities of: Imperatriz, Porto Franco, Nina Rodrigues, Santa Inês, Viana, Anapurus. This project was developed between March 2020 and July 2021, with the participation of a total of 140 students, who finished with scientific work. Of this total, 50 students presented scientific works, which represented 35.71% of participants in the Scientific Seminar organized by the Coordination of the Pilot Project at UFMA (MEC/DED/CAPES, 2021).

The aforementioned Pilot Project for Distance Scientific Training at UAB centers in Maranhão had as its general objective the development of Scientific Initiation and as specific objectives: to develop and implement a proposal for distance scientific initiation; build a gamified virtual environment for the development of permanent student guidance activities during the project; develop research and scientific communication skills in UAB students; to develop and test a model of implementation of scientific initiation in the distance modality.

It was possible for the group of 140 students participating in the activities of the Pilot Project for Scientific Training to develop skills and competences in the area of research as a tool for academic work, giving them more advantageous conditions to face the final paper.

The evidence offered by the pilot project at UFMA indicates a possible implementation of scientific training and, therefore, due to the innovative character of UAB degrees, and presents itself as an academic action that transforms pedagogical projects, potentially capable of providing the student body with access to new concepts. and practical skills that you can apply in the classroom and during teaching.

There are expectations in the academic sphere around the establishment of research groups at the UAB poles, because this action may allow the creation and expansion of knowledge in the disciplines, as well as the expansion of inter-institutional activities. From this movement, the participation of students undergoing training in scientific production can emerge, with articles published in specialized journals, scientific events and, also, there is the possibility of more comprehensive results, such as a virtual platform to support coping with the final paper.

2. Theoretical framework: thinking about teacher training integrated to the research

Researchers deal with the process of teacher training in a world in constant transformation and, mainly, added to the technological evolution applied to education.

The relevance of the discussion about the concept of training from the perspective of the teacher-researcher has instigated the interest of scholars, such as: André (2009), Demo (2015), Cochran-Smith (1999), Contreras (2002), Gatti (2010) , Lüdke (2006), Nóvoa (1992), Tardif (2002), Zeichner (1992), who defend the need for research to be part of the teacher's work in a reflective way.

For Demo (2011), first of all, it is essential to emphasize research as a scientific principle and research as an educational principle:

> First, it is necessary to distinguish research as a scientific principle and research as an educational principle. We are working on research mainly as a pedagogy, as a way of educating, and not just as a technical construction of

> knowledge. Well, if we accept that, then the research indicates the need for education to be questioned, for the individual to know how to think. It is the notion of the autonomous subject that emancipates itself through its critical consciousness and the ability to make its own proposals. (DEMO, 2011, p. 22).

In the view of Tardif (2002), a practical-reflective training will help the teacher to respond to different situations in the classroom, where he will be able to propose new solutions to the teaching and learning process under his responsibility. And, under this condition, it is essential that the teacher assumes responsibility for conducting and transmitting academic knowledge, improving it through daily research activities and using didactic strategies and alternatives in lesson plans with the aim of to facilitate the teaching and learning process, improving teaching practice.

Zeichner (1992) argues that the teacher should systematize reflection, making it investigative. And, from this perspective, the training universities, among other agents, need to review the curricular proposals and training programs in the degrees, moving towards innovative, interdisciplinary, transversal training models that address the challenges of today's world.

Lüdke (2006), in his studies, mentions that the curricular proposal of licensure courses must focus on investigation based on their own didactic methods and procedures in order to be effective. Of course, in a process of advancement in teacher training, we must not lose sight of the fact that, in the historical process, the school that was idealized had, and still has, the mission and direction for the transmission of knowledge and culture accumulated by humanity, but, now, this mission is being questioned by a world in transformation and advances, mainly technological:

> […] it was a space of cultural transmission whose culture was clearly distinguished from the outside and was supported by an alliance between the State and families, nowadays the school competes with other cultural agencies such as the mass media and the internet for the

> transmission of knowledge, the intellectual formation and the education of the sensibility of the children and adolescents. And it competes in disadvantageous conditions, since, due to its "hard" characteristics, due to its structuring grammar, the school is less permeable to these new configurations of fluidity and uncertainty. (DUSSEL, 2009, p. 375).

And, for Gatti (2010), the curricular proposals of the degree courses have shown little progress:

> Teacher training cannot be thought of from the point of view of science and its various disciplinary fields, as an addendum to these areas, but from the social function proper to schooling — teaching the new generations the accumulated knowledge and consolidating values and practices consistent with our civil life (GATTI, 2010, p. 1.375).

Differently from the model of technical rationality, which raises the separation between theory and practice, according to Contreras (2002), the classroom is the place where the theory and the knowledge learned must be applied by the teacher.

It can be seen, then, that teacher training in traditional curricular models does not meet the requirements of social transformation, and it is no longer possible to have a fragmented understanding of knowledge, as well as rationality and disciplinarity. And Zeichner (2008) draws attention to the challenges of implementing this training proposal in the university environment. In turn, Nóvoa expresses:

> […] challenges us to rethink this model in an attempt to overcome the dichotomous view between specific knowledge and applied knowledge, between science and technique, between theory and practice, between knowledge and methods, which is present in many undergraduate courses […] (NÓVOA, 1992, p. 20).

Following, then, this line of argument that undergraduate courses

need to advance in their curricular perspectives, proposing innovations and more attractive training projects, it is possible that these changes based on a concept of teacher-researcher training can contribute to the professionalization of teaching:

> […] The formation of the researcher teacher can be one of the possibilities of professionalization of teaching, as research can make the subject-teacher able to reflect on his professional practice and to seek ways (knowledge, skills, attitudes, relationships) that help him to improve each his teaching work, so that he can effectively participate in the process of people's emancipation (ANDRÉ, 2006, p. 223).

For Lüdke (2001, 2006), the researcher reinforces even more the contact with research at the undergraduate level, and it cannot be restricted to scientific initiation students only.

From these reflections among the authors, despite the conception of extension activities and research in the curricular bases of teacher training, we started to discuss scientific training in UAB's licensure courses.

3. Methodological aspects, practical framework and analysis of results: research component in uab undergraduate courses

Investigations carried out from 2015 onwards (DOMINGO, 2015) about the research component in UAB undergraduate courses became the methodological basis for the investigation that results in this article, which concerns the following aspects: curriculum structure of undergraduate courses, analysis of disciplines that are related to research, main teaching-learning means used in the discipline of Scientific Methodology, matrix (planning) of teachers who work in the distance modality and, finally, a case study in order to know the main difficulties of our graduating students in relation to the elaboration and defense of the final paper.

This investigation pointed out serious difficulties in three directions that can be the focus of attention of different researchers and specialists interested in the research topic in UAB's undergraduate courses.

3.1. Improvement of the Research Methodology discipline at UAB

We can assure you that the level of knowledge of our students in the undergraduate courses at UAB in relation to the research component is incipient. Firstly, this statement is based on the analysis of the curricula of at least 70% of the degree courses (SISUAB, 2022), which include as a fundamental element the realization of the Research Methodology discipline, with 60 hours in the distance modality (almost always in the first or second period of the course, that is, at the beginning). Other subjects are indicative of the topic in question, called: Interdisciplinary Teaching-Learning Project (I and II), Monograph (I and II), Research Project Development (almost at the end of the course), between 60 and 120 hours. Thus, a total of 120-180 effective hours of activities linked to research as a tool for academic work were identified and, if we consider the total hours of a teaching degree course with at least 3,200 hours, about 6% to 8% of the course workload is dedicated to the research component.

As an exception to the rule, we can place the Degree in Pedagogy, in whose curriculum we find four disciplines related to investigation, namely: Research Methodology, Statistics Applied to Education, Research Methodology in Education and Research Project, together with the Work of Completion of the Course (final paper) (existing in all undergraduate courses), with a duration of three months to prepare and defend.

When we consider, in a comparative analysis, for example, how the National Distance University (UNED) in Spain faces this issue, we find that the following subjects are included in the curriculum of the Education course: Experimental Pedagogy (Adaptation); Statistics Applied to Education (code 240372), with 60 hours; Experimental Pedagogy II;

Research Methods and Designs in Education (code 242325), with 60 hours; Techniques and Instruments for Data Collection and Analysis, with 60 hours; Techniques and Instruments for Collecting Information (code 50315), with 60 hours; Research Methods in Social Education; Methods and Research Projects in Education (code 501084), with 60 hours; Research Methods in Education; Methods and Research Designs in Education (code 495038), with 60 hours.

The set of subjects totals 300 hours, that is, almost twice as much as in Brazil, and is distributed throughout the training period, a fact that substantially helps in the preparation that the student receives in the area of use of research as a tool for job. In addition, the important elements offered by the Spanish curriculum, such as Statistics Applied to Education and Research Designs in Education, can boost quantitative research integrated with qualitative ones, and in Brazil, there is still a tendency to use qualitative research in most of research carried out in education.

About five years ago, the Research Methodology discipline was taught with printed materials, however, today, different digital teaching resources serve as didactic support, in video format (fundamentally, on YouTube), as well as the Objects of Learning (LO), which deal with topics related to this discipline.

In this way, it is possible for teachers to diversify the Teaching and Learning Means (MEA) in digital format using them in different contexts within the scope of the discipline, applying different methods (especially active methods), accompanied by didactic resources that facilitate understanding and the assimilation of the contents by the students, given that the expressive majority dominates the technology in a natural way.

3.2. The "research" component in the curriculum subjects of UAB's undergraduate courses

Research, in UAB's degree courses, in particular, concerns teaching. The professors of the subjects of these higher courses teach students to

use research as a function of the teaching-learning process, fundamentally, to present the contents with some kind of exercise, but without reaching the level of application of knowledge that guarantees in-depth stages of assimilation. , essential for using the research as a work tool.

After analyzing ten teaching plans, curriculum matrices of different disciplines and teachers who teach classes in the distance modality, we show, in sequence, that the main tasks that appear in seven of these matrices are: reading the handout and the book that supports the discipline ; reading documents, fundamentally, from the internet; reflective reading and textual production; reading articles in the area; watching the videos (made on the internet); carrying out practical activities based on video analysis; face-to-face classes (videoconference) expository-dialogue; answer the questions prepared by the teacher; answer the questionnaires within the Virtual Learning Environment (VLE); elaboration of lesson plans; Watch the slides prepared by the teacher.

As can be seen, most of the content topics are not directly related to research, and the reading dedicated to materials highlights research articles already produced in the distance modality and, in activities that promote or encourage scientific initiation, identify The following tasks are carried out: elaboration of a critical review and registration of indicated literature.

Another point that draws attention in the analyzed matrices is the activities centered on few VLE tools, with emphasis on forum, questionnaire, sending tasks and viewing videos. Only a small group of three teachers, with extensive teaching experience, particularly in the Distance Education (DE) modality, found other tasks that could be linked to the development of research as a work tool. They are: research of articles and preparation of a summary with a catalog card; use of Wiki (from the VLE) for writing texts by groups of students; search for concepts to create a Glossary (within the VLE); use of Wikipedia to research biographies of renowned experts; textual elaboration with authorship; search for documents on specialized portals; elaboration of concepts from research; preparation and holding of seminars; elaboration of projects (pedagogical and research); search for research related to a particular topic; preparation of a logbook (observation).

It is clear, then, from this analysis of the planning of classes and curricular matrices, aiming at the development of the teaching-learning process of degree courses in the EaD modality, that some teachers observed through the lesson plans still present a incipient preparation on the subject of scientific training, and this fact has a significant impact on the preparation of students, reducing the development of skills and competences necessary to face the final paper and, also, the improvement of training.

Considering the analysis of the matrices and lesson plans of those more experienced teachers, it can be observed that there was a greater use of different VLE tools, in addition to the Wiki, the glossary, the research links, the logbook, being able to to verify a substantial expansion of the range of activities and VLE tools available for teaching work.

3.3. On the main difficulties of graduating students

The investigation of the scientific formation of the students of the undergraduate courses of the UAB, considering the result of the questionnaire applied to a group of students in the phase of conclusion of the course, that is, students who would finish the subjects of the curriculum and face the elaboration and defense of the final paper, made it possible to observe that the final theme paper is a stressful stage in academic life, due to gaps in research and research methodology. For this reason, the moment of confrontation in the final paper is considered rocket science.

As already mentioned, the vast majority of undergraduate courses provide between 6 and 8% of the total hours of the curriculum to work on elements linked to research. These moments are fundamentally identified by the Research Methodology discipline (60 hours) and one or two other preparatory disciplines for the preparation of the final paper (between 60 and 90 hours).

We then proceeded to analyze what students think about this important moment of elaboration and defense of the final paper. The first

point that draws attention is that most students have not defined the research project before the seventh period of the course, leaving little space for carrying out research moments related to a specific topic.

During the analysis, the response of respondents reached 42 students of the degree courses: Music (11), Computing (1), Geography (4), Mathematics (1), Pedagogy (25). Most respondents were between 21 and 35 years old (23 students), and the minority were between 36 and 50 years old (19 students). Therefore, most were already born in the internet age.

It is also important to note that, of the total number of students surveyed (42) who answered the questionnaire, most belong to the group of advisees who participated in the experience of the Pilot Project of Scientific Initiation conducted by the UAB/UFMA team, with the exception of 11 students from the Porto Franco center of the Degree in Pedagogy. That is, the majority (31 students) had research experience resulting from involvement with the activities of the Pilot Project UAB/UFMA.

Regarding the question of the questionnaire about expressing research as a work tool, specifically, "on a scale of 1 to 10, how do you value the use of research in the subjects of your course curriculum by your teachers and tutors during the training period". The responses had the following configuration.

- 48.8% responded with an appreciation of 10 points.
- 31.7% responded with an appreciation of 9 points.
- 14.6% responded with an appreciation of 8 points.
- 4.9% responded with an appreciation of 7 points.

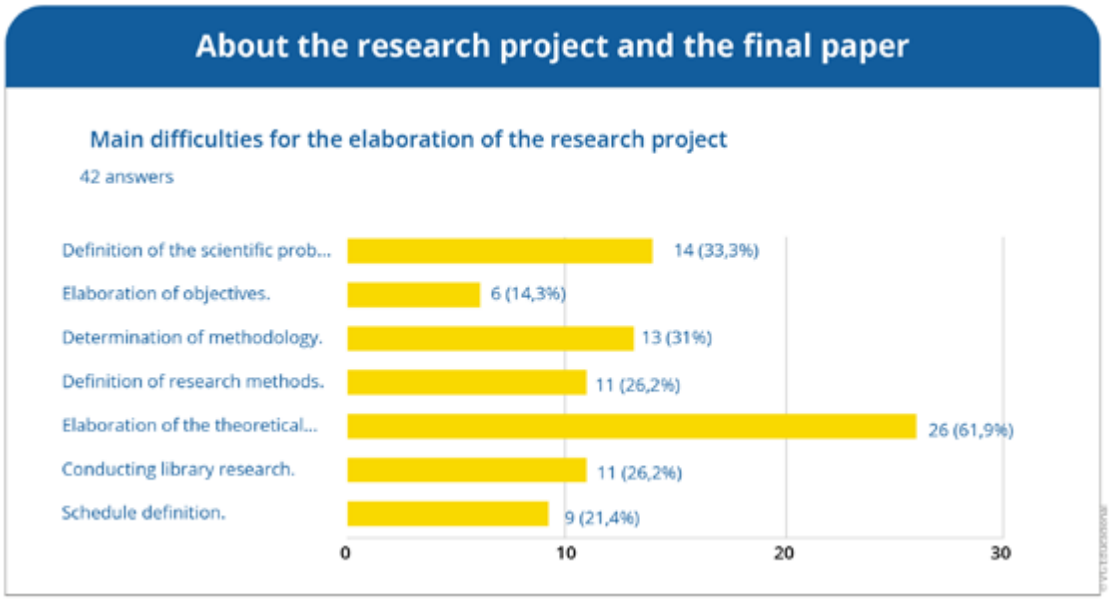
It is observed that these answers could indicate that most students value the use of research in curriculum subjects; however, in contradiction with the teachers' plans, which, as we have seen, do not include, or partially include, research activities in their classes. However, the students who attributed the highest marks of appreciation to the research activities are consistent with the result of the work of professors and tutors within the scope of the pilot project.

In the item that sought the participation of the students in the research, we see that the situation changes. About the question: "on a scale of 1 to 10, how do you value your knowledge about the use of research to carry out teaching activities in your course?".

- 39% value it with a grade of 10.
- 26% value it with grade 9.
- 31.7% value it with grade 8.
- 2.4% value it with grade 6.

We can assess that most students attributed a degree of appreciation with grades between 9 and 6 when referring to the use of research as a work tool. And, when we asked about the moment of elaboration of the research project, activity prior to the elaboration of the final paper, the result was highlighted in Figure 1, below.

Figure 1 — Main difficulties in preparing the Research Project



Source: Prepared by the authors (2021).

The analysis of the item makes it possible to verify that three

important elements appear for the elaboration of the research project, which, according to the responding students, present serious difficulties. Firstly, the elaboration of the theoretical foundation with 61.9% of students with problems. This means that more than 50% of students do not master the basic tools for an adequate bibliographic research in the different websites and digital search engines existing in the country, that is, they are not familiar with specialized websites by areas of activity, in which important updated theoretical references could be used for that purpose.

It can be said, then, that most students focus their efforts and attention exclusively on national references, without an appropriate search for information from foreign sources, despite the translation possibilities that are currently available in different applications. Likewise, plagiarism is still worrying and, on a recurring basis, we still find students who simply copy and paste information from the internet without proper references to the sources consulted.

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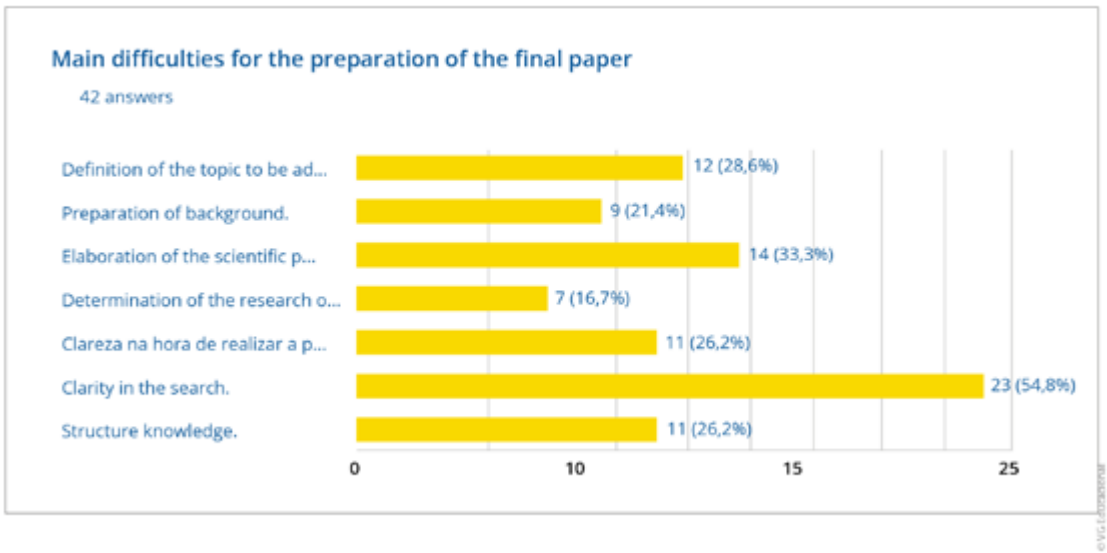
Thirdly, in 31% of the difficulties, the definition of the methodology appears, that is, we observed little mastery of the use of different theoretical and empirical methods, as well as the definition of a paradigm, showing, almost absolutely, the predominance of the use of qualitative methods without sufficient and necessary quantitative data that can support any research result.

Such problems, of an academic nature, show a set of difficulties that accumulate at the time of carrying out the research, fundamentally, due to the lack of effectiveness and constancy of disciplines directed to the theme and, also, due to the lack of exercise during the development of the courses, in the absence of tasks in which the student can use the

research as a work tool.

By analyzing Figure 2, arranged in sequence, we identified the main difficulties faced by students when preparing the final paper, and, as already discussed, students have problems accumulated throughout the course when they go to develop practical activities using the search tool.

Figure 2 — Main difficulties in preparing the final paper



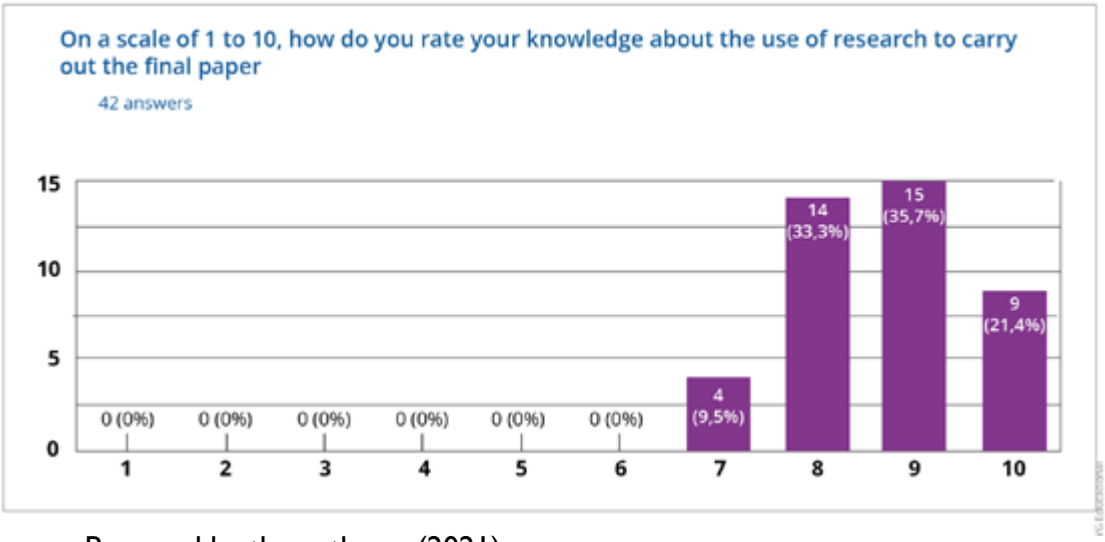
Source: Prepared by the authors (2021).

Among the main difficulties, the knowledge and use of ABNT norms stand out (54.8%), meaning that more than 50% of the students, during the course, do not prepare and present works of a scientific research, such as projects and articles, which require specific knowledge of the rules of elaboration and presentation as an antecedent to the final paper.

The scientific problem that was already mentioned by the students as an item of difficulty in the elaboration of the project (Figure 1) now appears with 33.3% of difficulty, showing the persistence of this problem not overcome until the end of the training course.

In the question about valuing students' knowledge about the use of research for the conclusion of the final paper, from Figure 3, it can be seen that most students, more than 78%, attributed scores between 7, 8 and 9 points , with only 21.4% considering knowledge in the area with a score of 10.

Figure 3 — Valuation of knowledge about research by students



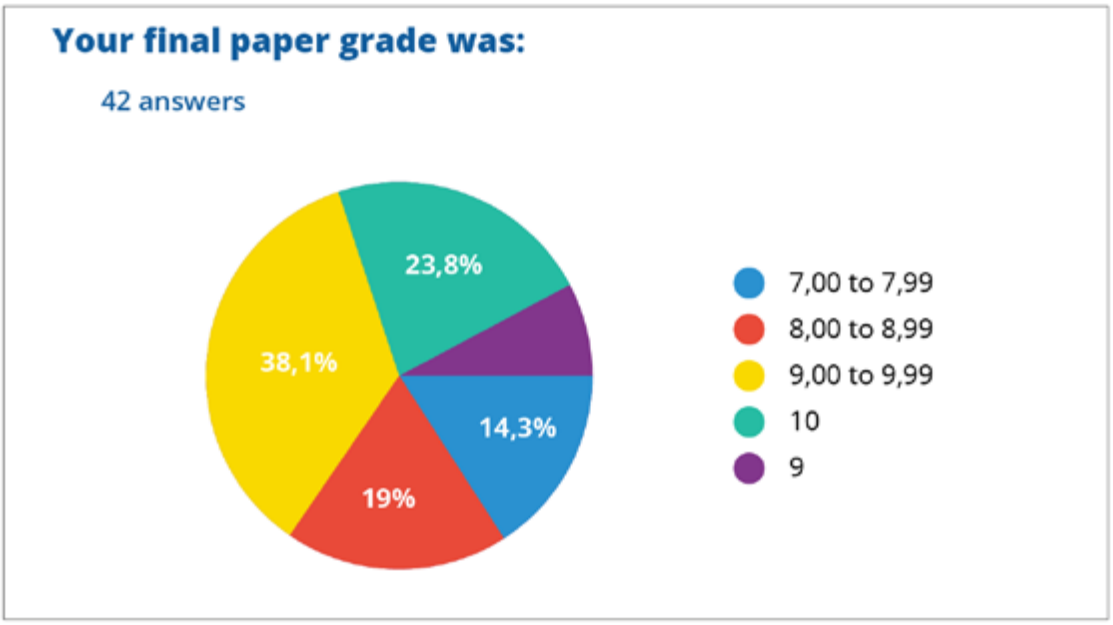
Source: Prepared by the authors (2021).

It is also important to point out, in this research that led to the elaboration of this article, that most of the participating students and respondents of the questionnaire had the experience of developing activities in the Pilot Project of Scientific Initiation at UAB/UFMA, for approximately one year. During this period, it was possible to have direct contact with investigation and preparation tasks for the preparation and defense of the final paper. Of this group of 42 participants, 11 of them did not have contact with the Pilot Project, but received preparation through a final paper supervisor professor, carrying out an important group of research tasks, from how to combat plagiarism and support in use of ABNT standards, which also ensured the success of the final paper without disapproval.

Next, in Figure 4, it can be seen that the grades obtained in the

defense of the final paper are distributed between 10 and 8 (more than 85% of the students), with 14.3% of the students obtaining grades below 8 points.

Figure 4 — Grades achieved by the students surveyed



Source: Prepared by the authors (2021).

The grades obtained by the group responding to the questionnaire could be considered satisfactory based on the approval criteria of all, since a high percentage of grades above 8 points means that students who used the survey as a work tool throughout the formative stages of the course and, therefore, when facing the final paper, they present less difficulties.

3.4. On the incentive of the Distance Education Board of CAPES: proposal to create scientific training groups in the face-to-face support centers of UAB

Improvements in the administrative and academic management of UAB have been proposed by DED/CAPES since 2014, when the report extracted from Sisuab (2022) presented a group of 78 institutions with training rates below 50% of offers initiated in 2006 and completed on December 31st, 2014.

Some of the main actions aimed at encouraging the UAB community have been intensified through the prospection of studies and research and, in the case of this article, the authors propose a reflection in the theoretical and practical field of an innovative concept for teacher-researcher training in UAB degrees.

In this process, still embryonic in the field of academic and scientific discussions, it was possible to present the theme and reflect on how to improve the investigation component in undergraduate courses in the distance modality of the UAB in national spaces, such as in the Brazilian Association of Education at Distance (ABED). Also, in the set of efforts to raise awareness of the universe of UAB institutions/degrees, the approval of the Pilot Project for Scientific Training at UAB/UFMA (2019) and also the creation of the National Scientific Training Group at UAB/ DED/CAPES in 2020.

It is worth mentioning the creation of the Working Group at DED/CAPES, composed of specialists to discuss and propose an orienting report for an academic action in the degrees of the poles of the UAB. The main objective focused on encouraging the creation of Scientific Training Groups, aiming at the development of integrated teaching, research and extension activities applicable to basic education, focusing on students in the process of training in the UAB degrees.

This general objective stems from the mobilization of students in the degrees to develop scientific initiation, creating a differentiated posture

and driven by research of an interdisciplinary nature, with a critical-reflexive and investigative profile, in addition to acquiring the ability to get involved in information sharing networks and knowledge between the poles and the Public Higher Education Institutions (IPES) of the UAB, through a scientific training platform to be configured with the characteristics and purposes relevant to the theme in focus in this work.

Considering the operationalization of the UAB System delegated to CAPES by the MEC, which assigns to DED the competence to forecast and execute the budget and academic management of the distance courses taught by the IPES, the operational activities to promote the creation and development of Scientific Training Groups would take place through the approved/adjusted work plan following the legal guidelines for public funding.

4. Final considerations

Scientific training in undergraduate courses at UAB presents itself as an academic activity that complements training, aiming to increase the preparation of future teachers who need to appropriate scientific and investigative methods for later application in classrooms of educational networks, which may contribute to raising the IDEB/HDI in the near future, achieving improvements and helping to reduce truancy.

From the analysis and consolidation of the data investigated within the scope of the Partial Report of the National Scientific Training Group, Pilot Project of Scientific Initiation (2021), developed by the UFMA/UAB team, and also by the responses to the questionnaire applied to the group of 42 students in the process of finalization and preparation of the final paper, there is no doubt that the research component in the UAB degrees must be deepened and perfected by carrying out a set of disciplines and tasks throughout the training process.

Teacher training has been a challenge for the Brazilian State.

Inland municipalities lack professors with higher education degrees, given that the supply of public places for higher education courses has always been concentrated in large urban centers. The socioeconomic and regional inequality so characteristic of the country contributes to the fact that not all states and municipalities have solid teacher training plans, increasing the inequality of access to the teaching career.

According to the 2019 School Census (INEP, 2021), in Brazilian schools, about 40% of teachers working in high school do not have adequate training in the subjects they teach. They are professors who graduated in another area and do not have a degree or even graduated from university. This same census indicates that there is a great disparity between the five regions. The most critical situation is in the Midwest, where only 50.7% of high school teachers and 50.2% of elementary school II teachers have adequate training. In the Northeast, the rate is also low: 53.9% of professors in the last stage of education have undergraduate and licentiate degrees in the subject they teach. Even in regions with better numbers, the situation is not satisfactory. In the South, 70.6% of high school teachers have a bachelor's degree in the area in which they work, that is, 29.4% teach content in which they are not specialized on a daily basis.

In perspective, the training universities should pay attention to the reformulation of the workload of the Research Methodology discipline, which, in most lesson plans, has a workload of 60 to 90 hours, and should be expanded to between 120 and 180 hours and, also, to give students the opportunity to deepen in other subjects, such as: Statistics Applied to Education, Methods and Research Designs in Education, with a necessary review of the application of the quantitative and quanti-quali method applied to research in the area of education.

In another perspective and of equal importance, are the courses and programs of continuous formation that must occur throughout the life of the professors, being able to be instituted of short duration, in the distance modality, and to propose other subjects, as: to develop activities of investigation in the various curriculum disciplines, how to use the research tool in the day-to-day of the classroom, how to enhance the use of digital teaching resources on the internet.

A short and medium term action is the possibility that the universities that are part of the UAB system have to adhere to the Scientific Training program, object of the report approved by DED/CAPES and which will be encouraged in the face-to-face support centers as a way to enable students(to) undergraduate students an integrated training to the concept of teacher-researcher.

Finally, it is important to register the wish that this study can encourage other professionals from distance education and, in particular, from undergraduate courses to continue researching and exchanging experiences, further expanding discussions and reflections on the positive factors of investigative teacher training.

It is necessary to consider the context of a country with continental dimensions, in order to understand that a teacher training action, based on scientific premises, is not a simple task. It is essential that the federative pact prescribed in the Federal Constitution be established in fact, based on an integrated management carried out by the MEC, since it is extremely necessary to reach the 5,570 municipal and 27 state education networks.

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