THE PLACE OF TEACHING PRACTICE, EXTENSION AND SUPERVISED INTERNSHIP IN MATHEMATICS TEACHING

O LUGAR DA PRÁTICA DE ENSINO, DA EXTENSÃO E DO ESTÁGIO SUPERVISIONADO NO ENSINO DE MATEMÁTICA

EL LUGAR DE LA PRÁCTICA DOCENTE, LA EXTENSIÓN Y LAS PRÁCTICAS SUPERVISADAS EN LA EDUCACIÓN MATEMÁTICA

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ABSTRACT

This article aims to discuss possibilities for curricularizing extension programs associated with mathematics teaching practices. This perspective is grounded in current educational legislation and has been suggested by researchers linked to the fields of Education and Mathematics Education, who view student participation in teaching, research, and extension projects related to the pedagogical practice of school mathematics as essential to teacher training. As a research procedure, an analysis was carried out regarding the vision of Supervised Curricular Internship present in the current curricular pedagogical project – PPC of the Mathematics Degree course at the Federal University of Acre – UFAC, with the intention of showing that this important curricular component should not be restricted to simply fulfilling bureaucratic and academic requirements, but should in fact constitute an opportunity for personal and professional growth and as an instrument of integration between the institutions responsible for training – university, school and community. The results of this research, guided by a reading and analysis of current legislation and based on reflections by theorists in the field of didactics, point to the possibility that student participation in teaching, research, and extension projects focused on the teaching and learning processes, as a pedagogical practice in mathematics, can be valued, including contributing to the construction of a professional identity focused on teaching mathematics in basic education schools.

Keywords: Extension Curricularization. Teaching Practice. Supervised Internship. Mathematics.

RESUMO

Esse artigo tem por objetivo discutir possibilidades da curricularização da extensão associada a pesquisa e a prática de ensino em Matemática. Essa perspectiva está fundamentada na legislação educacional vigente e vem sendo sugerida por pesquisadores vinculados a Ciência da Educação e da Educação Matemática que veem a participação dos alunos em projetos de ensino, pesquisa e extensão, relacionados com a prática pedagógica

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da Matemática escolar como indispensáveis a formação docente. Como procedimento de investigação foi realizado uma análise a respeito da visão de Estágio Curricular Supervisionado presente no atual projeto pedagógico curricular – PPC do curso de Licenciatura em Matemática da Universidade Federal do Acre – UFAC, com a intenção de mostrar que esse importante componente curricular não deve ficar restrito a simples cumprimento de exigências burocráticas e acadêmicas, mas constituir-se de fato como oportunidade de crescimento pessoal e profissional e como instrumento de integração entre as instituições responsáveis pela formação – universidade, escola e comunidade. Os resultados desta investigação pautada pela leitura e análise da legislação atual e fundamentada em reflexões de teóricos do campo da didática, apontam para a possibilidade de que a participação dos alunos em projetos de ensino, pesquisa e extensão, voltados para os processos de ensino e aprendizagem, enquanto prática pedagógica da matemática, sejam valorizados, inclusive contribuindo para construção de uma identidade profissional voltada para uma prática docente do ensino de Matemática nas escolas de Educação Básica.

Palavras-chave: Curricularização da Extensão. Prática de Ensino. Estágio Supervisionado. Matemática.

RESUMEN

Este artículo tiene como objetivo discutir las posibilidades de curricularizar las actividades de extensión asociadas a la investigación y la práctica docente en Matemáticas. Esta perspectiva se basa en la legislación educativa vigente y ha sido sugerida por investigadores vinculados a las Ciencias de la Educación y a la Educación Matemática que ven la participación de los estudiantes en proyectos de enseñanza, investigación y extensión relacionados con la práctica pedagógica de la matemática escolar como indispensable para la formación docente. Como procedimiento investigativo, se realizó un análisis sobre la visión de la Pasantía Curricular Supervisada presente en el actual proyecto pedagógico curricular – PPC de la carrera de Licenciatura en Matemáticas de la Universidad Federal de Acre – UFAC, con la intención de mostrar que este importante componente curricular no debe restringirse simplemente al cumplimiento de requisitos burocráticos y académicos, sino que debe, de hecho, constituir una oportunidad de crecimiento personal y profesional y un instrumento de integración entre las instituciones responsables de la formación – universidad, escuela y comunidad. Los resultados de esta investigación, guiados por la lectura y el análisis de la legislación vigente y fundamentados en las reflexiones de teóricos del campo de la didáctica, apuntan a la posibilidad de valorar la participación estudiantil en proyectos de docencia, investigación y extensión centrados en los procesos de enseñanza y aprendizaje, como práctica pedagógica en matemáticas, contribuyendo incluso a la construcción de una identidad profesional orientada a la práctica docente de matemáticas en escuelas de educación básica.

Palabras clave: Curricularización de la Extensión. Práctica Docente. Prácticas Supervisadas. Matemáticas.

1 INTRODUCTION

This article aims to discuss the development and place of Teaching Practice, Extension and Supervised Internship in the teaching of Mathematics, initially understanding that these three curricular components have a fundamental role in the formation of the Mathematics teacher, as they integrate theory with practice, provide experiences in the school environment and allow the development of pedagogical skills and critical reflections, inserting the future teacher in the reality of the school community. The activities planned in these components have the fusion of equipping the licentiate with practical and innovative knowledge, making him safer and able to deal with the challenges of teaching and to transform the educational reality.

Extension, for example, in Mathematics Degree courses has been recommended in the reforms of pedagogical projects in order to comply with CNE/CP resolution No. 4, of May 29, 2024, which provides for the National Curriculum Guidelines for Initial Training at Higher Level. This resolution points out the possibility of linking extension actions, projects and programs to teaching practice, integrating extension activities to the Pedagogical Political Project (PPP) of the courses so that students put into practice knowledge in real experiences with the school community, as required by resolution CNE/CES 7/2018 of December 2018 that *Establishes the Guidelines for Extension in Brazilian Higher Education and regulates the provisions of Goal 12.7 of Law No. 13,005/2014, which approves the National Education Plan – PNE,* determining that 10% of the workload of undergraduate courses is extension. This inclusion seeks to bring the university closer to society, valuing teacher training and the return of academic knowledge to the community.

This debate points to some difficulties, but also possibilities for transformations in the daily lives of these professionals, as there seems to be a consensus in the academy that the development of the supervised internship is a particular moment in the training in which the student can experience a diversity of experiences and get to know his field of activity better. According to Pimenta and Lima (2004) "the internship is the central axis in teacher training, because it is through it that the professional knows the indispensable aspects for the formation of the construction of identity and day-to-day knowledge". For this, it is reasonable that the training school offers a diversity of possibilities aiming at the full development of the trainee.

Silva (2005) argues that in the academic routine it is noticeable that undergraduates get involved with great willingness and enthusiasm when the university provides them with the participation in which they can put theoretical knowledge into practice, accompanied by a supervising professional or when they have an associated institution that they are in

permanent contact with the university. In this way, the intern can learn to observe and identify problems, always absorb and seek information, questioning what he found, in addition to exchanging information with more experienced professionals. According to Francisco and Pereira (2004), the internship emerges as a fundamental process in the training of the intern, as this is the way to make the transition from student to teacher. This is a moment of training in which the undergraduate student can live experiences, getting to know his area of expertise better.

For Guerra (1995) "the Supervised Internship consists of theory and practice with a view to a constant search for reality for a joint elaboration of the work program in the educator's training", enabling the student in the training process to develop a researcher's posture through observation and moments of reflection that can contribute to reorganize actions that can reorient practice when necessary. Thus, part of the Supervised Internship curricular component can be considered, which, as established by Resolution CNE/CP 04/2024, should start from the student's entry into the course, with the observation of the school environment and participation in teacher planning groups at the school, to be developed also in teaching, research and extension projects linked to research groups and extension programs, which has as its object of study and investigation the pedagogical practice of Mathematics.

This is in accordance with the thinking of several educators in the educational field, including Silva (2007), Carvalho (1985), Cury (2004), Lima (1986), Pimenta (2004) and Gomes (1992) and meets the recommendations prescribed in the available federal legislation, especially after the advent of the Law of Guidelines and Bases of National Education, law 9394/96, and in the normative acts resulting from it, because in most of the projects that focus on the training of Mathematics teachers, it is necessary for their participants to be present in Basic Education schools, either to obtain information that will constitute data for carrying out these researches, or to test, in the classroom environment, proposed curricular subjects in order to favor a better quality of teaching and student learning, or to carry out communications of the results of research carried out with a focus on the knowledge of the school, especially what happens in the classroom.

Particularly, we understand that teacher training takes place in multiple ways and the performance of graduates in teaching, research and extension projects are, above all, privileged forms of teacher training. This, in our view, contemplates what is recommended by CNE/CP resolution No. 4, of May 29, 2024, when it establishes that the supervised curricular internship must be carried out in basic education schools and experienced during the training course with enough time to address the different dimensions of professional performance.

For this, we agree with Silva (2007) and defend that it is necessary that there is an internship project planned and evaluated jointly by the initial training school and the internship field school, with clear objectives and tasks and that the two institutions help each other, which presupposes formal relations between the educational institution and the units of the Basic Education systems. These "times at school" should be different and according to the objectives of each moment of formation. Therefore, the internship cannot be under the responsibility of a single teacher of the training school, but involve a collective action of the trainers, since a single teacher may find it difficult to manage the number of interns (on average 50) who enter the course every year.

In this way, we understand that the teaching, research and extension activities developed by students in projects linked to study groups aimed at teacher training and addressed to the Basic Education school, under the responsibility of qualified professionals, constitute moments of professional training, either by direct exercise in loco, or by participatory presence in environments specific to the professional area.

We understand, therefore, that the process of curricularization of extension can be part of the disciplines of Mathematics Teaching Practices, articulated with the Supervised Internship, associating Teaching, Research and Extension to the formative context, since teaching alone "cannot be alone responsible for the professional qualification of the teacher" (PICONEZ 1998, p.30). Thus, we agree with Pimenta and Lima (2004) when they argue that one of the purposes of the internship is to integrate the student's training process, in order to consider the field of action as an object of analysis, investigation and critical interpretation, based on the connections with the other disciplines of the course. In view of the above, it is worth questioning **how should the offer of teaching, research and extension in Mathematics Degree courses be organized in order to meet the demands of current legislation**?

2 METHODOLOGICAL ASPECTS

Within the scope of the Federal University of Acre (UFAC), Resolution No. 026, of October 27, 2020, approved the rules, procedures and criteria that regulate extension activities, considering the "National University Extension Policy, the Institutional Development Plan (PDI); The need to update the regulation of extension activities, vital for the academic process and its inseparability between Teaching, Research and Extension", aiming to:

> I – To enhance and expand the quality levels of the proposed actions, projecting their nature and the social commitment of Ufac, in line with teaching, research and social demands. II – To stimulate the social development and critical spirit of students, with a

> view to professional performance based on citizenship, on the social and transformative function of higher education, focusing on public policies, as well as providing opportunities for the exchange of academic and popular knowledge. (Art. 4 of Resolution No. 026, of October 27, 2020).

Apparently, the registration and mandatory inclusion of extension activities in the curricula of undergraduate courses was regulated, implying a new curricular configuration. While the mandatory participation of students in the development and applications of extension projects was instituted, this caused concerns regarding the way it would be implemented in the mathematics degree course at UFAC:

> ... mainly in the possibility that, by carrying out the curricularization of extension only to satisfy legal requirements, the power that extension may have in itself is destroyed. In this way, it is feared that their dialogicity and ability to capture different realities, in order to contribute to the constitution of new contours of research and teaching, will be undermined (COSTA, 2019, p. 112)

In view of the possible effects and impacts of this new curricular configuration on the academic training of subjects in initial training, we seek to understand how the offer of teaching, research and extension in mathematics degree courses should be effectively organized, in order to meet the demands of the current legislation?

As mentioned in the introduction of this study, the issue that seems to be most recurrent in terms of the efforts mobilized in teacher training is in the various forms of relationship between theory and practice, which is in fact what underpins training, however, it is also the object of many doubts as to its form of structure, organization and constitution. Recent studies such as those mentioned above and reflections carried out within the scope of training institutions point to the need for the Supervised Internship to go beyond the limit of the way it has been mostly practiced, usually through isolated actions with the apparent objective of fulfilling the workload. In this context, the Supervised Internship starts to have a fundamental function that should not only be restricted to taking theoretical knowledge to the field of practice, but understanding it, re-elaborating it, thinking about the reality experienced by the future teacher. Thus, it is up to the agents involved to reflect on the implications that this new posture can bring to the work of the Supervised Internship teacher and how this can be effective.

The university, according to Pimenta and Lima (2004), is par excellence the formative space for teaching, even if it is not simple to train for the exercise of quality teaching. The expectation is that in this space there will be interaction with the Basic Education school. Thus, it is essential that research and extension as spaces for investigation and exhibition of

knowledge constitute possibilities for intervention in teacher training. For this, some procedures are necessary to prove this interaction, such as the return of what was researched, elaborated and re-elaborated from the presence of the intern in the Basic Education school, in proposals for continuing education for this school and the presence of this in the university in significant proposals for reporting experiences, for example, or even in the internship classes with the presentation and discussion of pedagogical themes and class study (*Lesson Study*) which is characterized as a collaborative professional development methodology where teachers plan, observe and analyze a class together to improve student learning and their own practice.

This possibility involves the creation of a group of teachers who meet to study and perfect a class, which is then taught and observed by colleagues. The analyses are focused on the students' reactions and the teaching-learning process, generating a continuous cycle of reflection and improvement. The Classroom Study is a professional development process based on the main learning difficulties of the students perceived by the participating teachers. This process provides teachers with a deeper understanding of student learning and how to promote it in the classroom, is the subject of research in the study and research group on teacher training that teaches mathematics.

The legitimacy of the university as a space for training is materialized, therefore, from these procedures, both for the trainee student and for that education educator, who receives the trainee student, as both are "formed" in practice. Therefore, in the investigation about the school and in the school, in all its performances, there is a conception and a concrete possibility as a referral to the supervised curricular internship. In other words, conceiving it as research presupposes a direct clash with the classroom, with the daily life of the school and with the legitimation, confirmation and/or transformation of theoretical aspects constructed in specific training disciplines.

The insertion of the intern in the school in research activities can follow a theoretical-practical approach that will certainly make the pedagogical practice more qualitative, more dynamic and transformative. This can also collaborate with all the aspects that make up the entire school: management, intra- and extra-school relationships, planning, etc. It is in this context that the collegiate of the Mathematics Course must contemplate in its Pedagogical Political Project, part of the curricular component Supervised Internship, as a possibility of insertion of the intern in the basic school through extension and research activities linked to projects that have been developed by teachers who teach in the course. Interpreting what is recommended by the current legislation, it can be understood that Class Regency presupposes professional initiation as a knowledge that seeks to be guided by teaching-

learning theories to respond to the demands posed by the pedagogical practice to which it is directed.

Extension projects can structure activities in the form of seminars, mini-courses and workshops for teachers, students and other school communities or even non-formal education groups on specific themes of each degree course. Research projects can favor a set of proposals on educational research about "concerns" specific to the teaching-learning process and its specificities. Following this logic, the interns of the Mathematics Degree Course may, during the development of the Supervised Internship curricular component, develop monitoring activities and seminars aimed at monitoring the work of educators who work in special education groups, youth and adult education, senior citizen groups, etc. Developing activity reports, thematic seminars and other possibilities of the situational reality of the university and school units.

Thus, the curricular component Supervised Internship covers, in our view, teaching, research and extension and in this we agree with several thinkers in the educational field, among them Cury (2004), who argues that the Supervised Internship should provide the intern with the opportunity to articulate between the moment of knowing and the moment of doing, because "the moment of knowing is not separate from the moment of doing, and vice versa, but each one has its own epistemological dimension. Learning to be a teacher, therefore, is recognized as a professional knowledge intended for a teaching action in the education systems" CURY (2003, pp. 113-122).

The supervised curricular internship is the discipline in which the intern must experience various practices and various ways of being a teacher. According to LDB 9394/96 in its article 13, education professionals must experience school life in general, from activities of elaboration of the school's pedagogical proposal, to the preparation and fulfillment of work plans, followed by activities, such as zeal for student learning, establishment of recovery strategies for students with lower performance, participation in periods of planning, evaluation and professional development, and collaboration in activities of articulation of the school with families and the community.

3 TEACHING, RESEARCH AND EXTENSION: PROPOSAL FOR THE PPCs

CNE/CP Resolution No. 4, of May 29, 2024, which deals with the processes of formulation and reform of the Pedagogical Projects of Teaching Degree Courses, brings relevant contributions with regard to supervised internship and the extension curricularization process. Hence two issues are posed as challenges that can substantially change the way in which Undergraduate Courses are currently offered. On the one hand, it is possible to

conceive the curricularization linked to the disciplinary curricular compenetres, on the other hand the Supervised Internship must be offered throughout the development of the Course. The offer of these curricular components must be associated with the tripod Teaching, Research and Extension, as highlighted in article 12 and its sole paragraph:

> **Article 12**. Initial training is intended for those who intend to teach basic school education in its stages and modalities of education and in other situations in which pedagogical, theoretical and practical knowledge is foreseen. **Sole Paragraph**. The activities of the teaching profession also include the performance and participation in the organization and management of Basic Education systems and their educational institutions, encompassing: I - planning, development, coordination, monitoring and evaluation of projects, teaching, pedagogical dynamics and educational experiences; and II - production and dissemination of scientific-technological knowledge in the areas for which he or she received training and those in the educational field. (CNE/CP RESOLUTION NO. 4, OF MAY 29, 2024)

Article 13 of the aforementioned resolution establishes that the initial training courses, respecting the national diversity and the pedagogical autonomy of the institutions, will consist of nuclei I, II, III and IV, with special emphasis on Nucleus I – General Training Studies - EFG: composed of scientific, educational and pedagogical knowledge that underlies the understanding of the educational phenomenon and school education and forms the common basis for all licentiates, Articulating:

> ... scientific, educational and pedagogical knowledge that underlies the understanding of the educational phenomenon and school education and forms the common basis for all teaching degrees, articulating: a) sociological, philosophical, historical and epistemological principles and foundations of education; b) principles, values and attitudes committed to social justice, recognition, respect and appreciation of diversity, promotion of participation, equity and inclusion and democratic management; c) observation, analysis, planning, development and evaluation of educational processes, pedagogical experiences and teaching and learning situations in Basic Education institutions; d) multidimensional and interdisciplinary knowledge about the human being and educational practices, including knowledge of the development processes of children, adolescents, young people and adults, in the physical, cognitive, affective, aesthetic, cultural, playful, artistic, ethical and biopsychosocial dimensions; e) diagnosis and analysis of the needs and aspirations of the different segments of society, related to education, being able to identify different forces and interests, to capture contradictions and to consider them in pedagogical plans, in teaching and, consequently, in learning processes; f) research and study of educational legislation, the processes of organization and management of the work of professionals in the teaching of basic school education, financing policies, evaluation and curriculum; g) research and study of the relations between education and work, education and diversity, education and communication, human rights, citizenship, environmental education, among other central problems of contemporary society; h) studies of ethical, didactic and behavioral aspects in the context of professional practice, articulating academic knowledge, research, extension and educational

practice; and i) knowledge about different strategies for planning and evaluating learning, centered on the full development of Basic Education students (CNE/CP RESOLUTION NO. 4, OF MAY 29, 2024).

Nucleus II is presented in Resolution CNE/CP No. 4, of May 29, 2024 as learning and deepening of the specific contents of the areas of professional activity - ACCE: composed of the specific contents of the areas, components, thematic units and objects of knowledge defined in a national document of curricular guidance for Basic Education and the knowledge necessary for the pedagogical mastery of these contents. In Nucleus III it is about the Academic Activities of Extension - AAE, which according to the aforementioned resolution should be carried out in the form of practices linked to the curricular components: they involve the execution of extension actions in Basic Education institutions, with guidance, monitoring and evaluation of a teacher trainer of the HEI.

Finally, Nucleus IV is presented referring to the Supervised Curricular Internship – ECS, characterized as a mandatory component of the curricular organization of the licentiate degrees, and must be carried out in a Basic Education institution and having as its main objective the performance in the training of the licentiate, being planned to be the bridge between the academic curriculum and the space of professional action of the future teacher. The intern, defends Resolution CNE/CP No. 4, of May 29, 2024, should be offered "numerous opportunities so that progressively the licentiate student can connect with the theoretical aspects of his training, with his practical applications, initially through observation and progressively through his direct performance in the classroom.

Therefore, we present a proposal for the participation of students from the Mathematics Degree courses in programs, projects and extension and research actions that focus on the pedagogical practice of school Mathematics. For this, we consider that Supervised Internship is an integrating element, associated with teaching, research and extension, not being restricted to the simple fulfillment of bureaucratic and academic requirements, but constituting itself as an opportunity for personal and professional growth and as an instrument of integration between the institutions responsible for training – university, school and community, favoring the construction of a professional identity focused on a practice teacher who can effectively contribute to the improvement of the teaching of Mathematics in Basic Education schools.

3.1 HISTORICAL VIEW

During the twentieth century, the logic of the Mathematics teacher training courses, as well as the logic of the other educator training courses, was based on the epistemological

assumptions of technical rationality, in which theory has little connection with practice, that is, practice is subordinated to theory. In this conception:

> The curricula are normative, with the sequence of knowledge of the relevant scientific principles, followed by the application of these principles and a practicum, whose objective is to apply the principles of the science studied in daily practice. Within the technical rationality, the development of professional competencies must therefore be placed after basic and applied scientific knowledge, since it is not possible to learn competencies and application skills before applicable knowledge [PEREZ GOMES, 1992, p. 98].

Thus, the Supervised Internship as a discipline, argues Piconez (1998), has been defined in the curricula of the teaching degree courses as a complementary discipline, with the objective of putting into practice what was theoretically learned by the student to complement his training. The dichotomy between theory and practice, in this conception, is evident even in the disposition of the discipline in the curricular matrix.

The debate on issues related to theory and practice in the discipline of Supervised Internship became, from the 1980s of the twentieth century, an object of study in the educational field. Authors such as Azevedo (1980), Candau & Lellis (1983), Carvalho (1985), among others, suggest in different ways the unification of theory and practice. In their reflections, these authors argued that the guidelines for the referral of the Supervised Internship did not privilege discussions between educator and student about the daily life of the classroom, the school and the community. Thus, the knowledge of the school reality through the internships did not favor reflections on a creative and transformative practice, nor did it enable the reconstruction or definition of theories that would support the teacher's work.

From the 1930s onwards, concerns with the Supervised Internship intensified, especially with the institution of the Didactics course in 1939, whose conception involved, as Silva (2007) argues, studies related to the Teaching Methodology, related to planning, the execution of the teacher-student relationship and the verification of learning, leading to a possibility of Teaching Practice, where the intern could also learn explanatory techniques that would allow him to identify and dimension community resources, as well as to intern in institutions that developed activities related to his future qualification. However, it is from the end of the twentieth century that the Supervised Internship began to be conceived as a privileged space in the struggle for the improvement of teacher training, especially in the training of Mathematics teachers, where the discourse for the improvement of the quality of the teaching of this discipline became frequent and the search for overcoming the dichotomy between theory and practice that became an instrument of struggle for the quality of teaching and for the transformation of the role of the discipline Supervised Internship, which for a long

time conformed to the traditional script marked by the planning of teaching activities, observation and classroom management.

In the field of teacher training for the area of Mathematics, this debate has been driven, in the last 20 years, by the reflections promoted by the orientations of educators and mathematical educators based on a new paradigm determined by the advancement of technologies and the so-called knowledge society, pointing out the need to review old concepts and new practices for teacher training. It is in this context that we must, as a teacher and researcher involved with issues related to professional development, identity, teacher training and knowledge that articulate theory and practice, seek new paths and possibilities that can lead our interns to a more comprehensive training, with a focus on improving the quality of teaching in Basic Education.

3.2 PROPOSAL FOR THE PPCs

The proposals for pedagogical political projects of the Mathematics Degree Courses must present in an articulated way, teaching, research and extension strategies, contemplating, above all, the issue that is presented at the moment, linked to actions, projects and extension programs to the Teaching Practice and the Supervised Internship, thus integrating extension activities to the Pedagogical Political Project (PPC), so that students put into practice the knowledge in real experiences with the school community, as required by the legislation that determines that 10% of the workload of undergraduate courses is extension.

This inclusion seeks to bring the university closer to society, valuing teacher training and the return of academic knowledge to the community, ensuring the conception, guidelines and principles present in Article 3 of Resolution No. 7, of December 18, 2018 when it describes that:

> Extension in Brazilian Higher Education is the activity that is integrated into the curricular matrix and the organization of research, constituting an interdisciplinary, political, educational, cultural, scientific, and technological process, which promotes the transformative interaction between higher education institutions and other sectors of society, through the production and application of knowledge, in permanent articulation with teaching and research.

In addition, it is proposed that the curriculum should be articulated with Centers I, II, III and IV, established by Resolution CNE/CP No. 4, of May 29, 2024, particularly in relation to Centers III and IV.

3.3 CURRICULAR COMPONENTS

Specifically, we propose the following curricular components that involve nuclei I, III and IV present in Resolution CNE/CP No. 4, of May 29, 2024 to be developed from the first academic period:

Table 1

Curricular components

DISCIPLINES	MENU	C/H	CREDITS
Initiation to Teaching, Research and Extension.	Historical evolution, conceptual construction, principles and guidelines of teaching, research and extension in public universities. The principle of inseparability between teaching, research and extension, aiming at the approximation between the university and society, critical self-reflection, the theoretical and practical emancipation of students and the social meaning of academic work. Teaching, research and university extension policies. Teaching, research and extension projects and actions, curricular insertion of teaching, research and extension projects and actions. Applicable methodologies, presentations and approximation with the teaching, research and extension actions of the Academic Units of UFAC.	60	2-1-0
Teaching Practices and Methodologies of Special/Inclusive Education	Inclusive education in the school system: curriculum, evaluation and didactics. Inclusive methodologies, assistive technology, universal design for learning – UDL. Planning, pedagogical experiences, situations and experiences of teaching and learning in basic education institutions.	60	2-1-0
Teaching, Research and Extension Practice in Mathematics I	Mathematics Teaching addressing aspects of content and methodologies. Study and Analysis of Curricular Materials for the Teaching of Mathematics. História das Leis e Documentos Oficiais da Educação Básica. The National Common Curricular Base and State Curriculum Proposals. Organization of the contents of Basic Education in the Official Documents of Education. Teaching Planning: theoretical discussion and practical implementation through Acex. Critical reflection on Textbooks and Paradidactics. Didactic Materials Elaborated in Mathematics Teaching Laboratories. Participation in extension actions in public schools.	60	2-1-0
Teaching, Research and Extension Practice in Mathematics I	Mathematical Pedagogical Knowledge: the Mathematics that is learned and taught. The new high school and the training itineraries. Mathematical games for teaching and learning Mathematics. Theoretical and practical reflection on Problem Solving. History of Mathematics in the teaching and learning of Mathematics. Ethnomathematics and social contexts. Experimental classes relating mathematical contents of Basic Education developed through Extension Actions in public schools.	60	2-1-0
Teaching, Research and Extension Practice in Mathematics II	Discussion on the different teaching modalities and reflection on didactic materials for specific teachings: Youth Education; Adults and the Elderly; Special Education; Quilombola Education; Indigenous Education; Rural Education; and Technological Education. Discussion and reflection addressing aspects of specific teaching contents and methodologies. Inclusive Mathematics Education. Interdisciplinary Projects...	60	2-1-0
Teaching, Research and Extension	Theoretical and practical reflection on pedagogical approaches: Information and Communication Technology, Modeling, and Critical Mathematics Education. Experimental classes relating	60	2-1-0

Practice in Mathematics III	topics of Arithmetic, Algebra, Geometry, Information Processing, Combinatorial Analysis, Probability, Statistics or Financial Mathematics.		
Teaching, Research and Extension Practice in Mathematics IV	Teaching and learning of mathematics from: the relationship between man and nature; Technologies and environmental degradation; methodological and practical approaches to environmental education. Methodological organization in the form of projects; research and extension. Problem solving; Mathematical Modeling, use of concrete materials; games and technological resources, which allow for didactic structuring of the concepts present in school mathematics. The teaching of mathematics valuing differences and diversity, through the promotion of inclusive mathematics education. Extension actions developed in public schools.	60	2-1-0
Mathematics Education, Social Practices and Extension Actions	Teaching and learning of mathematics from: the relationship between man and nature; Technologies and environmental degradation; methodological and practical approaches to environmental education. Methodological organization in the form of projects; research and extension. Problem solving; Mathematical Modeling, use of concrete materials; games and technological resources, which allow for didactic structuring of the concepts present in school mathematics. The teaching of mathematics valuing differences and diversity, through the promotion of inclusive mathematics education. Extension actions developed in public schools.	60	2 – 1 - 0
Mathematics Education, Cultural Practices and Extension Actions	Teaching and learning of mathematics based on: the historical and cultural identity of the Brazilian people; in ethnic-racial relations; in the history of Afro-Brazilian and African culture; in the fight against racism and valuing ethnicity; in the black, Afro-descendant and indigenous cultures in Brazil; in the debate on employability, human rights and the new poles of power. The teaching of mathematics valuing differences and diversity, through the promotion of inclusive education based on human rights; in assistive technologies and inclusive practices. (Re) Construction of pedagogical practice in the teaching and learning of mathematics for visual and intellectual disabilities. Extension actions developed in public schools.	60	2 – 1 - 0
Digital Technologies in the Teaching of Mathematics and Extension Actions I	Mathematics teacher training and pedagogical practice with media integration. Teaching planning with technologies for Regular Education, Quilombola Education, Indigenous Education, Technological Education, Inclusive Mathematics Education. Digital Technologies and Assistive Technology. Mathematics Teaching using: information and communication technologies focused on Problem Solving, History of Mathematics, Modeling and Mathematical Games. Interdisciplinary projects. Experimental classes using digital technologies. Extension actions developed in public schools.	60	2 – 1 - 0
Digital Technologies in Mathematics Teaching and Extension Actions II	Mathematics teacher training and pedagogical practice with media integration. Planning of Mathematics teaching in High School, Youth and Adult Education and Special Education. Teaching Mathematics using: information and communication technologies, Problem Solving, History of Mathematics, Modeling and Mathematical Games. Interdisciplinary projects. Experimental classes with the use of information and communication technologies relating topics of Arithmetic, Algebra, Geometry,	60	2-1-0

	Information Processing, Combinatorial Analysis, Probability, Statistics or Financial Mathematics. Extension actions developed in public schools.		
History, Philosophy and Mathematics Education	History of Mathematics in Egypt, Mesopotamia, Greece, China, India, Europe and the Americas. Discussions and reflections on historiographical and epistemological issues and some relations between History of Science and History of Mathematics and between History and Mathematics Education. To epistemologically situate the theoretical-methodological bases that they use in research on Mathematics Education. An overview of the Philosophy of Mathematics, in view of some of the main questions in the history of mathematics. Discussions about the nature of mathematical thought, involving philosophical currents such as positivism, logicism, constructivism, naturalism, formalism, intuitionism, etc. Extension actions on the history of mathematics as a tool to give meaning to teaching, contextualizing learning and arousing the interest of students.	60	2-1-0
Supervised internship in Mathematics Teaching I	Participation in research and extension projects aimed at the training of teachers who teach Mathematics. Observation of the school environment of the public school and participation in the planning of Elementary School II Education.	60	1-0-1
Supervised internship in Mathematics Teaching II	Participation in research and extension projects aimed at the training of teachers who teach Mathematics. Observation of the school environment of public high schools. Participation in High School planning.	60	1-0-1
Supervised Internship in Mathematics Teaching III	Observation of the school environment and the Mathematics classroom with participation in the planning of teaching activities, organization of teaching and learning situations and didactic material in Youth and Adult Education, or Professional and Technical Education at the high school level, Special Education, Indigenous School Education, Rural Education, Quilombola School Education or Distance Education.	60	1-0-1
Supervised Internship in Mathematics Teaching IV	Organization of teaching and learning situations and didactic material; evaluation and development of teaching activities; regency of the Mathematics classroom in schools that offer Elementary School II.	60	1-0-1
Supervised Internship in Mathematics Teaching V	Organization of teaching and learning situations and didactic material; evaluation and development of teaching activities; regency of the Mathematics classroom in schools that offer regular high school.	60	1-0-1
Supervised Internship in Mathematics Teaching VI	Organization of teaching and learning situations and didactic material; evaluation and development of teaching activities; regency of the Mathematics classroom in schools that offer High School in Youth and Adult Education, or Professional and Technical Education at the High School Level.	60	1-0-1
Supervised Internship in Mathematics Teaching VII	Organization of teaching and learning situations and didactic material; evaluation and development of teaching activities; regency of the Mathematics classroom in schools that offer High School in Special Education, Indigenous School Education, Rural Education, Quilombola School Education or Distance Education.	60	1-0-1

Supervised Internship in Mathematics Teaching VIII	Reflections on the internships carried out in the school environment. Drafting and submission of reports for stages I, II, III, IV, V, VI and VII	60	1-0-1
WORKLOAD T: 470 + P: 360 + E: 360	1,200 HOURS		32-13-8

Source: Authors of the proposal, 2025.

In this way, the curricularization of Extension, in the PPC of the Mathematics Degree course, will be associated with Teaching and Research during the student's academic and professional training process, either through participation in activities related to these three pillars of the university, which, according to the Brazilian Constitution, are inseparable and complementary, or throughout the development of the curriculum, in which students can engage in projects to apply theoretical knowledge (Teaching), generate new knowledge (Research) and interact with society (Extension). This participation aims to enrich the curriculum, develop practical skills and competencies, and contribute to social and cultural development.

4 FINAL CONSIDERATIONS

In the context presented, the Supervised Curricular Internship may take place in public education institutions: municipal and state, and there is also the possibility of taking place in non-formal educational institutions when in extension and research activities. Considering the possibilities presented and what is contained in the legal provisions, the activities to be planned for this curricular component should take into account the accumulated discussions and the experiences lived in alternatives present in teaching, research and extension projects, triggering a process of continuous reflection on how the development of these curricular components may happen in practice and, especially what is its current conception, as it is no longer appropriate to repeat modalities that legitimize the separation between theory and practice and/or to conceive it as a complement to the contents of specific training.

Teachers who work in this curricular component will therefore have the challenge of going beyond what has mostly been interpreted and practiced in order to train Mathematics teachers for the totality of Basic Education. It must, above all, consider teaching and learning processes, contents legitimized by the academic and school community, management, planning, relationship with the community, with educators and students, which presupposes alternative directions to the traditional way, guided by the paradigm of technical rationality. For this, it is necessary that the training institution make clear in its internal legislation and in its administrative structure, mechanisms that enable the regulation of these important curricular components based on alternatives presented and that can actually strengthen the

training of its students, contributing to the improvement of the teaching of Mathematics in basic school.

We also believe that the involvement of interns in programs developed by the University, such as the Tutorial Education Program – PET, whose purpose is to promote a broad training of students at the undergraduate level, encouraging them to develop a conscious and voluntary control of their training process, appropriating scientific and/or technological knowledge of a high academic level, developing their autonomy, establishing epistemological, ethical and social commitments that are present in their action as a student and in their future professional performance, thus contributing to the formulation of new strategies for the development and modernization of education, seeking to reduce, above all, school dropout.

Another example can be sought in the Interinstitutional Program for Teaching Initiation – PIBID, which according to Medeiros, Carvalho and Grando (2012) combines initial training, school teachers and University teachers who use this training space to develop practices and research on teacher training. From this perspective:

> The school's teachers assume the supervision and coordination of undergraduate students in order to provide them with knowledge about the school in its different spaces, rhythms, times and culture. The undergraduate student, on the other hand, contributes to these professors in the sense of bringing them discussions, often theoretical, arising from their studies at the University and together, professors and students seek in the school reality possibilities to rethink pedagogical practices, or even innovate. This partnership marked by future teachers and school teachers is completed by the University's professors who, together with students and teachers, assume the role of pedagogically organizing the actions and projects developed in the school environment. In this sense, we can say that the PIBID Program contributes to the constitution of a teacher learning community, in which everyone benefits from multiple learnings [MEDEIROS, CARVALHO AND GRANDO, 2012, p. 67-68].

These programs, among others, are privileged forms of students' relationships with the knowledge of teaching, so these experiences can and should be valued within the scope of the course, including the possibility of exemption from part of the Supervised Internship, according to current legislation, which establishes that "extension, monitoring and scientific initiation activities in higher education, developed by the student, can only be equated to the internship in case of provision in the pedagogical project of the course". Finally, it should be clarified that we understand regular teaching activity as going beyond classroom regency, which is only a constitutive part of the Supervised Internship carried out in the traditional way. In this case, the current legislation also provides for these possibilities:

> Art. 4 - Extension activities must make up at least 10% (ten percent) of the total student curricular workload of undergraduate courses, which must be part of the curricular

> matrix of the courses; Art. 5 - The conception and practice of the Guidelines for Extension in Higher Education are structured: I - the dialogical interaction of the academic community with society through the exchange of knowledge, participation and contact with complex contemporary issues present in the social context; II - the citizenship education of students, marked and constituted by the experience of their knowledge, which, in an interprofessional and interdisciplinary way, is valued and integrated into the curricular matrix; III - the production of changes in the higher institution itself and in other sectors of society, based on the construction and application of knowledge, as well as by other academic and social activities; IV - the articulation between teaching/extension/research, anchored in a single, interdisciplinary, political, educational, cultural, scientific and technological pedagogical process. (RESOLUTION NO. 7, OF DECEMBER 18, 2018)

In this way, we propose extension, associated with teaching and research, consolidating what characterizes the Brazilian university and daily practice. Finally, it should be noted that this integration has already been put on the agenda with article 207 of the Brazilian Constitution (BRASIL, 1988), which proposed the integration of teaching, research and extension activities in the university context, through the articulation between theory and practice.

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