

Responsibilities and Perception of Course Coordinating Professors of the Curso de Licenciatura em Matemática no IFSP Regarding the Scope of the Function

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2238-0345 

10.37001/ripen.v14i1.3644 

Received • 02/10/2023

Approved • 13/01/2024

Published • 15/04/2024

Editor • Gilberto Januario 

Abstract: The present article, which is an excerpt of the author's thesis, presents the responsibilities and perceptions of the Coordinating Professors of the Curso de Licenciatura em Matemática no Instituto Federal de Educação, Ciência e Tecnologia de São Paulo (IFSP) from 2008 (the first offering of the course) to 2021 (the period of data collection). The aim is to identify the scope of the function, which requires both pedagogical and educational knowledge, as well as educational management skills. Data were obtained from institutional documents and a qualitative research questionnaire sent to former coordinators during the specified period. The analysis resulted in two dimensions: pedagogical and educational management. The function was characterized as articulating, formative, and transformative from a pedagogical perspective. In terms of educational management, it includes leadership, democratic processes, participatory management, organizational culture, and the organizational environment, all of which directly or indirectly impact the initial training of future mathematics teachers/professors.

Keywords: Course Coordinating Professors. Degree in Mathematics. IFSP. Function Extents. Pedagogical and Educational Management.

Atribuciones e impresiones de los Profesores Coordinadores del Curso de Licenciatura em Matemática no IFSP com respecto a las dimensiones del rol

Resumen: El presente artículo, que es un extracto de la tesis del autor, presenta las atribuciones e impresiones de los profesores que ejercieron el rol de Coordinación de lo Curso de Licenciatura em Matemática no Instituto Federal de Educação, Ciência e Tecnologia de São Paulo (IFSP), entre 2008 (año de la primera oferta del curso) y 2021 (fecha de recolección de datos), en relación con el ejercicio de dicha función. Con el objetivo central de identificar cómo el rol demanda dimensiones pedagógicas y de gestión educativa, se partió de documentos institucionales y de los datos de la investigación cualitativa, obtenidos a través de cuestionarios enviados a los (ex)coordinadores del período mencionado. Al optar por la categorización de los datos, se identificaron dos dimensiones: pedagógica y gestión educativa. Este enfoque condujo a la caracterización de la función como articuladora, formativa y transformadora, desde el punto de vista de la dimensión pedagógica, así como de la gestión educativa, compuesta por liderazgo, procesos democráticos, gestión participativa, cultura y clima organizacional, lo que impacta indirecta o directamente en la formación inicial de los futuros profesores de matemáticas.

Palabras clave: Profesores Coordinadores de Curso. Licenciatura em Matemáticas. IFSP.

Dimensiones de la Función. Pedagógico y Gestión Educativa.

Atribuições e impressões de professores coordenadores de curso de Licenciatura em Matemática no IFSP relativas às dimensões da função

Resumo: Este artigo, recorte da tese do autor, apresenta as atribuições e impressões dos professores que exerceram a função de Coordenação de Licenciatura em Matemática, no Instituto Federal de Educação, Ciência e Tecnologia de São Paulo (IFSP), entre 2008 (primeira oferta do curso) e 2021 (data de coleta dos dados), a respeito do exercício da função. Tendo por objetivo central identificar como a função demanda dimensões pedagógicas e de gestão educacional, partimos de documentos institucionais e dos dados da pesquisa qualitativa, obtidos em questionário enviado aos (ex)coordenadores do período supracitado. Ao optar pela categorização dos dados, obtiveram-se duas dimensões: pedagógica e gestão educacional. Este movimento resultou na caracterização da função como articuladora, formadora e transformadora, do ponto de vista da dimensão pedagógica, como também gestão educacional composta por liderança, processos democráticos, gestão participativa e cultura e clima organizacional, o que gera impacto (in)direto na formação inicial dos futuros professores de matemática.

Palavras-chave: Professores Coordenadores de Curso. Licenciatura em Matemática. IFSP. Dimensões da Função. Pedagógico e Gestão Educacional.

1 Introduction

As a result of the research conducted by the authors during a Postgraduate Program¹, this article investigates the Coordination of the Graduation in Mathematics at the Instituto Federal de Educação, Ciência e Tecnologia de São Paulo (IFSP). The aim is to understand the extent to which this function is characterized, both in official documents and in everyday actions, going beyond the typical understanding of managing a university course.

While there is considerable literature and research addressing Pedagogical Coordination or Educational Management in basic education, the same cannot be said for Graduation Coordination, particularly concerning Mathematics. This assertion is based on a two-stage review. In the first stage, we conducted a review of the state of the art, analyzing 795 papers published between 2001 and 2012 in Mathematics Education, available at Fiorentini, Passos e Lima (2016). Out of these, only one thesis investigated the relationship between the action of the Graduation coordinator and the initial training of mathematics educators, without specifically addressing the function itself. In the second stage, using the descriptors Coordenador de Curso, Coordenador de Curso de Licenciatura, and Formação de Formador de Matemática, we searched for publications between 2010 and 2020 in three academic databases: Portal de Periódicos da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), Catálogo de Teses e Dissertações da CAPES, and Biblioteca Digital Brasileira de Teses e Dissertações (BDTD). After analyzing the relevance of the topic in the titles and the search for corresponding keywords, out of the 154 work summaries analyzed, none specifically addressed the responsibilities of the Graduation coordinators at IFSP or the exercise of this function and its relationship with any pedagogical-didactic aspect.

Consequently, starting from the discussions that follow, our objective is to identify how this function demands pedagogical and educational management skills, based on the responsibilities and perception of the Professors Coordinators of the Curso de Licenciatura em

¹ Excerpt from the doctoral thesis defended in the Postgraduate Program in Education at the Federal University of São Carlos, Sorocaba Campus, authored by the first author and supervised by the second author

Matemática no IFSP, and how these impact the dynamics of the course and the initial training of future mathematics professors originating from this institution.

2 Methodology

Starting from a brief institutional history, we begin by discussing the organizational structure of IFSP to understand where the Bachelor's Degree in Mathematics fits in. Following the process of constitution and institutional identity formation, we present the context of offering the course and, consequently, the existence of the Course Coordination—a move made with the expectation of presenting the context in which the thesis research unfolded, aiming to assist in the analysis of the field-obtained data.

In addition to institutional documents that regulate the function and establish the responsibilities of the Course Coordination in *Curso de Licenciatura em Matemática no IFSP*, qualitative data were collected from teachers who held the position between 2008 and 2021. An electronic questionnaire was distributed to all 42 professionals across 13 different campuses, covering the period from the first offering of the course by the institution to the date of data collection. This instrument was designed to reach a large number of people simultaneously, encompassing a statewide territorial extension, ensuring freedom in responses, anonymity, and eliminating distortions to avoid influencing the researcher. The flexibility of the participation schedule also facilitated completion.

With 35 participants, the data were organized in an electronic spreadsheet, enabling the identification of the pedagogical and educational management skills required by the function. This process aimed to classify social data by encoding the open-ended questions of the questionnaire into the two aforementioned dimensions of the function.

For better understanding, the current text is divided into three parts. The first presents the characteristics of the institution where the function is performed; the second reflects on the responsibilities of the Course Coordination, as described in institutional documents, contrasting them with the statements of the (former) coordinators participating in the research; and the third, and final, analyzes the impressions expressed by these professionals in the exercise of the function, based on the reports presented regarding the significant moments they experienced during the course of their duties.

3 IFSP, the Coordination and the Bachelor's degree in Mathematics

Although the roots of the Instituto Federal de Educação, Ciência e Tecnologia de São Paulo (IFSP) trace back to the early 20th century with the establishment of the *Escola de Aprendizes Artífices de São Paulo* in 1910, its current identity emerged, following various transformations, with the enactment of Law No. 11.892 on December 29, 2008. This legislation not only expanded the institution's offerings but also authorized the introduction of postgraduate courses. Notably, it mandated that a minimum of 50% of vacancies in each campus be reserved for technical vocational education courses at the high school level, primarily in the form of integrated courses, and 20% for higher education courses (academic level) focusing on teacher formation for Basic Education, especially in the areas of Science and Mathematics (Brazil, 2008).

The organizational structure stipulates that the institution maintains a multicampus character. The General Directorate (DGR) of each campus holds responsibility for all administrative, patrimonial, and financial matters and collaborates with two deputy directors appointed by it. Notably, the Deputy Director of Teaching (DAE) oversees all pedagogical actions, provides support for the teaching and learning process, and supervises each

Coordinator of Basic and Higher Education Courses offered by the campus.

The Curso de Licenciatura em Matemática no IFSP commenced at the São Paulo campus in 2008 and is currently operational in 13 of the 37 existing campuses (35% of the existing campuses in 2022). Its impact becomes evident when comparing the vacancies offered by Higher Education Institutions (IES) in the state of São Paulo. Out of the 2,388 annual vacancies offered in the face-to-face modality across 70 Higher Education Institutions (HEIs), IFSP accounts for 640, representing 26.8% of the total offered in just one of the 16 public HEIs (Brazil, 2021). This establishes IFSP as the primary institution for the training of mathematics professors in the state of São Paulo, particularly in terms of the number of vacancies provided in the face-to-face modality.

4 Responsibilities of the Coordination

The function of Course Coordinator at IFSP is undertaken by a faculty member appointed through a regulated process, currently governed by Resolution No. 42/IFSP, dated May 8, 2018. This resolution succinctly outlines the electoral process, establishing that the Course Coordinator is elected for a two-year term, with only one re-election allowed. In the case of newly created courses, the first coordination can be appointed by the Campus Director. Candidates must be professors in the institution's permanent staff, and voters include professors, laboratory technicians associated with the course, and regularly enrolled students during the election period.

Regarding the responsibilities of the function, the Organização Didática do Ensino Superior do IFSP, effective since 2016, states in Article 5 that the function is intended to govern "the didactic-pedagogical procedures of all IFSP campuses" (IFSP, 2016b, p. 6). In Article 125, it establishes that the Coordination must plan "strategies for monitoring the attendance and academic performance of students in all IFSP courses" to ensure that interventions "guarantee students' insertion, permanence, and success." These responsibilities are assigned to the Course Coordinator, who must continuously and systematically carry out "actions to monitor the attendance and academic performance of students, in conjunction with professors and the socio-pedagogical coordination" (IFSP, 2016b, p. 46).

In addition to this shared academic management with other course agents, in the same Article 125, now in its paragraph 2, states that the intervention actions, led by the Course Coordinator in conjunction with other institutional actors, should promote the development of curricular practices that minimize "difficulties in the teaching-learning process or administrative-pedagogical problems that interfere with students performance" and strengthen the "academic environment as a welcoming, collaborative, and stimulating space for learning". This is complemented by "pedagogical monitoring that promotes inclusion, involving aspects of student assistance, socio-economic conditions, accessibility, individual, collective, and autonomous development of students, aiming at citizenship formation" (IFSP, 2016b, p. 46). In other words, the Coordination, together with professors and the institution's team of educators, psychologists, social workers, and educational affairs technicians, must assume a course management function that aims to impact the teaching and learning process of students.

Concerning issues of an "administrative-pedagogical" nature, it is noted that academic management is not composed solely of administrative acts but that these have an impact and relationship with teaching, curriculum, instruction, and learning, a management process that can thus be described as pedagogical. This perception is supported by the use of the term "curricular practices" coupled with an "academic environment [...] welcoming, collaborative" that stimulates learning and inclusion. Regarding the latter, inclusion implies "pedagogical

monitoring" of student development.

In addition to the aforementioned *Organização Didática do Ensino Superior do IFSP*, IFSP Campus Regulations, in Article 19, outline 42 functional attributions of the Course Coordinator. Unlike the Didactic Organization, which pertains to higher education courses, this document provides a set of responsibilities for coordinating any course offered by the institution, without distinguishing between various types and modalities, from Basic Education to Post-Graduation.

Despite the lack of specificity in administrative actions related to the organization of course documents (Article 19, sections XXX to XXXVIII), it is evident that the Coordination of the *Curso de Licenciatura em Matemática no IFSP* demands proactive academic management from the conception to the implementation of the course (Sections I to XXIV). Additionally, through its institutional representation (Sections XXXIII to XXXVIII), it prominently addresses various aspects of pedagogical dimensions. Reaffirming aspects already highlighted in the *Organização Didática do Ensino Superior do IFSP*, it emphasizes that the Coordination must be exercised in a participatory manner (Section V). This approach ensures not only the retention of students in the course but also their timely completion proposing (proactivity) and monitoring actions discussed in meetings with various groups and bodies (Section VI). This academic management must guarantee (according to Section VII) that the Pedagogical Project of Courses (PCC) succeeds in developing the competencies/skills outlined in the graduate profile. To bring the curriculum to life, this management must be closely connected to the classroom and professors (Sections IX and XII). Monitoring and supervision are not sufficient; there must be proposals and developments with a pedagogical perspective to meet the formative demands of both students (Section XXV) and professors (Section XXVII), without losing sight of the connection between teaching, research, and extension (Section XLII) (IFSP, 2016a, pp. 47-50).

In light of the above, minimizing difficulties in the teaching-learning process for students, offering continuous training tailored to the pedagogical demands presented by IFSP staff associated with the course, developing inclusive and reflective curricular practices, and leading the implementation and revision of Course Pedagogical Projects assign to the *Curso de Licenciatura em Matemática no IFSP* a set of characteristics from two dimensions: educational management and pedagogical.

Therefore, when analyzing the elements that make up the work journey of the *Curso de Licenciatura em Matemática no IFSP*, despite assuming that institutional responsibilities consume a significant amount of time and energy during daily tasks, it is necessary to understand what these activities entail. How much of these activities are pedagogical (or "pure" bureaucracy) and how much is educational management?

By questioning the coordinators themselves about the various functional responsibilities related to the daily coordination tasks, we asked them to provide responses based on intensity levels, with 1 being never and 5 being always. Looking first at those indicated with a high frequency of occurrence (4 or 5), we have:

- Organizational documentation of the course, with 32 out of 35 indications.
- Monitoring and evaluation of processes requested by the Academic Registrar's Coordination (CRA) (credit transfers, course withdrawals, transfers, etc.), tied with didactic-pedagogical support to students, both with 28 indications.
- Revision/reformulation, together with the Teaching Structuring Core (NDE) and/or Collegiate, of the Pedagogical Project (PPC), with 26 indications.

- Monitoring the retention and success of students (dropouts, failures, dependencies), with 24 indications.

From the above, it can be observed that activities deemed bureaucratic, involving institutional structure, and the procedural demands of various instances, sectors, and departments of the institution, address the earlier question regarding activities that consume the most time in the exercise of coordination. However, before delving further, it is crucial to recall our definition of bureaucratic activity as the "mechanical and uncritical practice of administrative rules and regulations that, although useful, lose their vigor and utility in the organization, monitoring, and evaluation of processes, and start to be used to limit them" (Lück, 2013, p. 112).

In second place, with 20 "always" indications (5), we identify the exclusive demand of the Academic Registrar's Coordination (CRA). This function, akin to that of an academic or school secretary, manages all documentation related to the student's academic life in the institution. From their enrollment (submitting documentation for registration) to their graduation (issuing a diploma), including attendance certificates and various other requests. Such demands require analysis and (in)deferment by the Course Coordination. Sometimes, they involve obtaining the opinion of a collegiate body (presided over by it), or even a signature from other employees, as well as information from other departments. Additionally, the use of digital systems in the institution, while facilitating the electronic preparation and processing of all documentation, also demands time (learning curve) to master the functionalities that are at different access levels than when they were professors.

Indication of a pedagogical action by the Coordination is only found in third place. With a broad spectrum, the term didactic-pedagogical support refers to any need that the students may have that directly or indirectly interferes with their academic performance. It can be complemented, to a certain extent, by the fifth most frequent attribute, the monitoring of the retention and success of students. In other words, we are talking about counseling on family problems or financial issues that affect attendance at classes or the completion of activities in or out of class; study guidance; mediation of conflicts between students and between students and professors, among many others. These are processes, procedures, or actions that make up the routine of this Pedagogical Coordinator of the Course, "which is constituted as a tangle of poorly defined functions, with an articulating or repairing character, ranging from bureaucratic work, relationships with families, management, up to the training of professors and other employees, participation in collegiate bodies, etc". (Herculano & Almeida, 2016, p. 134).

In fourth place, we have the indication of a significant responsibility, that is, the coordination of the works and the players of the course for the analysis of the course, taking into account its structure. This can range from a "simple" review of bibliographies to a complete reformulation of the course due to legislative or regulatory changes at the institution or governmental level. This function demands from the professional an understanding of the pedagogical and didactic aspects not only related to the training of future professionals at the higher level but also in the formation of future professors, who will have their understanding of teaching built in the implementation of a Course Pedagogical Project (PPC), which, by its name, already dispenses with any auxiliary comments.

The importance of this assignment is strengthened whenever we note that the supervision of academic activities (PCC, complementary activities, TCC, etc.), the supervision of academic spaces, and requests for acquisitions to improve the course and update the information on the course site with the latest information (PPC, teaching body, discipline schedules, and coordination, etc.) are also indicated as activities with a high frequency of occurrence (all with

21 indications). However, considering some difference from the previous ones, we can say that they represent the intersection between the pedagogical and bureaucratic aspects.

While the term "supervision" is commonly associated with inspecting a function, it encompasses directing and monitoring as well. Therefore, overseeing academic activities or evaluating the quality of spaces and equipment in the course, with the goal of improvement, guides the coordination toward a managerial education perspective that whenever leading a collective process, this perspective must be guided by democratic and participative management, fostering a culture and work environment conducive to its function and, consequently, contributing to the formation of future mathematics professors.

Analyzing tasks with a low frequency of occurrence (1 or 2, in Table 1), the first two, in decreasing order of indications, involve promoting and providing ongoing training for the teaching staff in the course - with approximately half of the 35 indications (17) - and evaluating the probationary period of professors and/or the selection process for substitute professors (with 14 indications).

While the second task is closely tied to the dynamics of hiring professors (permanent or temporary), influenced by the moment each campus experiences in the institution's expansion and course offerings, the assignment related to team formation may indicate an understanding that the continuous education of professors working in the course depends on the individual and/or the institution. It may not be the responsibility of the Course Coordination to promote it. However, it's also plausible that the high bureaucratic demand and assistance to students result in the low frequency of this assignment, reflecting only the lack of time for the Coordination to facilitate and encourage the teaching staff toward self-formation or collective formation meeting the course's demands. We will revisit this subject in the next chapter.

Thirdly, we find the support and/or promotion of the articulation between teaching, research, and extension in the course, complemented by the fourth-place assignment, encouraging participation in academic, scientific, and cultural events. In both cases, the necessity of the teaching-research-extension tripod in Higher Education is emphasized, constituting one of the educational values of the institution.

Regarding the verbs denoting expected actions, stimulate, support, and promote, they correspond to arousing enthusiasm, assisting, and putting into execution, respectively means that the Coordination is expected to initiate actions that not only inform about the existence of programs, procedures, and processes related to teaching, research, and/or extension but also stimulate professors and students to engage with each one. These actions should not be considered isolated but interconnected. We venture to say that this arises more from a time filled with other routine activities than from the perception that they are unimportant or a lack of desire to carry them out.

This perception is supported by the responsibilities assigned with mid-range indications, falling between the highest and lowest indications. These include proposing regulations and procedures within the course and providing didactic-pedagogical support to the professors. These attributes received higher indications of 4 and 5 compared to the five more indicated with 1 and 2. In other words, before contemplating how to integrate teaching, research, and extension or promote them, there was a need for Coordination's intervention in the actual teaching practice of professors in the course in order to ensuring the proposed didactic-pedagogical support.

We can think that this didactic-pedagogical support has the same scope as discussed in relation to students but with a focus on teaching action, which includes everyday situations of organizing spaces and times for a specific or special activity, as well as guidance for the creation

of different assessment processes. In both cases, these demands require specific knowledge of the teaching profession, whether acquired through initial, continuing, or in-service training or during professional practice. However, one cannot disregard the need for a more profound intervention in the way the professor conducts their lessons or in the teacher-student relationship as didactic-pedagogical support.

The statement above takes as a foundation for the lesson plans that professors must prepare semesterly for each subject they teach. These plans must be approved by the Coordination after evaluating the instruments and criteria proposed for assessing the teaching process, as well as the description of the lesson development, including weekly content to be delivered, teaching methodology, and planned resources. This evaluation demands from the professor, in his function as a coordinator, a set of knowledge related not only to pedagogy or mathematics but to both aspects. Ultimately, "the combination of experience and academic knowledge can provide greater confidence and trust for the transformation of content into teaching content, signaling the strength of pedagogical knowledge of the ementa" (Passos, 2018, p. 101).

This holistic perspective of the course and its participants allows for reflection and the proposal of regulations and procedures within the course (or changes to existing ones). This may seem paradoxical, because it requires dedicating time and energy to bureaucratic processes to prevent these processes from consuming more time and energy. Therefore, the question arises: how to disarm this trap?

The answer lies in shifting from thinking singularly to thinking collectively, adopting an educational manager's mindset. Through collaborative management, involving all actors in the process from conception to execution and responsibility, it becomes possible not only to share the burden but also to amplify energy and optimize time. This benefit extends not only to the Coordination but also to the professors, fostering their professional development, as indicated by Hees and André (2018, pp. 238-239), is favoured when provided with "opportunities to reflect with their peers on their practices, seeking references to analyze their practice, discussing their difficulties, and consequently finding new ways to their teaching process".

Drawing from the experience in the function, we gathered impressions from the (former) coordinators, offering insights into the recognition of an identity for the Coordinator of the Curso de Licenciatura em Matemática no IFSP. The (former) coordinators were prompted to express, based on their coordination experience, the level of agreement with the presented statements. This process involves "identification or non-identification with the responsibilities that always belong to the other since this process is only possible in the context of socialization, which, in the case of the pedagogical coordinator" of the course, unfolds in the function within the institutional and course context (Placco, 2012, p. 761).

The first hallmark of the identity of the Coordinator of the Curso de Licenciatura em Matemática no IFSP is the possession of some characteristics of the Pedagogical Coordinator of Basic Education. This assertion is supported not only by what has been presented thus far but also confirmed by the (former) coordinators themselves. The majority agreed (18 out of 35 with only 6 disagreements) that coordination requires much more didactic-pedagogical knowledge than initially imagined. It's crucial to note that this refers to knowledge specific to the coordination function, distinct from teaching. Thirty-one out of 35 participants agreed that coordination provides specific knowledge in professional development. This attribute requires professionals to acquire new knowledge and skills, echoing the literature, while not specific to Higher Education, there are strong similarities, parallels, and intersections with Coordination

in Basic Education, particularly in terms of articulation, formation, and transformation of the educational context in the Graduation Courses at IFSP.

The second hallmark in the quest for an identity does not exclude the recognition that this function is bureaucratic, as 22 out of 35 (former) coordinators agreed that this function involves organizing documents and complying with, or enforcing, what is established by the institution and/or legislation. In essence, it is part of this function to understand that the social organization in which they work has systematized formalized processes and protocols that structure its functioning, with some degree of justification. However, one must maintain a reflective and critical stance toward these processes, after all, "bureaucracy hinders or prevents the development of other pedagogical actions relevant to coordination," as pointed out by 29 out of 35 (former) coordinators.

We understand, therefore, according to Lück (2013, p. 112), that the Coordination's dealing with bureaucracy must, in the construction of its identity, have a stance less similar to those who act automatically and use "norms, regulations, and laws as guides for action" and more similar to those who act "reactively upon seeing the letter of the law" and seek in them "limiting and restricting aspects of action". This allows innovative and context-specific forms to emerge at the campus and course level, and the bureaucratic aspect merges with the pedagogical one rather than overshadowing it. After all, being a coordinator implies bureaucratic work but demands other pedagogical activities to be carried out, as agreed upon by 34 out of 35 (former) coordinators.

This type of perception also considers that being a coordinator requires "having a specific professor profile" (agreed upon by 22 out of 35 participants). In other words, in addition to the pedagogical aspect, this professional, as a manager, must have an attitude that aims to "promote the overcoming of difficulties, resolve conflicts, eliminate or reduce tensions that occur in the school process and hinder the creation of an educational environment favorable to the formation and learning" of the student, future mathematics professor (Lück, 2014, p. 105).

All of this gives the Coordinator a distinctive position comparing with other professors in the course, not only for what is demanded of them in the function but mainly because after it, there is a new active professor in the course. This is because, based on the experience of coordination, there is a new understanding of the Mathematics Teaching degree, as indicated by 31 out of 35 (former) coordinators. They come to master the theoretical content that unveils ideologies and limitations of institutional practice, sharpening "a critical awareness that [enables] an evaluation [of] practices, and, in particular, whether their purposes are (or can be) domination or emancipation" (Lima, 2021, p. 215).

Therefore, based on the reasoning presented so far, we conclude that the identity of the Curso de Licenciatura em Matemática no IFSP involves aspects of Pedagogical Coordination in Basic Education and Educational Management. Institutional responsibilities provide a foundation and reinforce the need to recognize this function as an integral part of the course that goes beyond the fulfillment of bureaucratic routines. On the contrary, it needs to engage in a personal relationship with students and professors so that the expectations outlined in the Pedagogical Project of the Course (PPC) for the initial training of future mathematics professors materialize in the daily life of the course. This is a discussion that we will continue to explore, analyzing the reported experiences of (former) coordinators, which highlights how coordination, management, and pedagogy are intertwined.

5 Perceptions of the Coordination Regarding the Exercise of the Function

In the previous section, we began to understand the demands and perceptions that a

professor identifies in their role as a Coordinator of the Course, which, as a consequence, are related to the institutional assignments, establishing pedagogy and educational management as dimensions of this function. Therefore, in continuation, we will analyze some responses given by the participants who answered the questionnaire, allowing for a deeper discussion of the presence of pedagogical and educational management dimensions in the Coordination of the Curso de Licenciatura em Matemática no IFSP.

Let's begin with the responses provided by the participants narrating significant events during their time in coordination. Analyzing them allowed us to group them into the following themes: Course evaluation by INEP/MEC, Course Coordination, Construction and/or Reformulation of PPC, Various Problems, and Spaces of Learning. It's worth noting that the same response can sometimes be classified into more than one theme, and two coordinators reported not having anything to report as they had recently assumed their positions during the survey.

Experiences related to the course evaluation process by the Instituto Nacional de Estudos e Pesquisas (INEP), linked to the Ministry of Education (MEC), were the most frequently mentioned in the narrations — 10 out of 35 participants. The descriptions provided by the participants regarding this experience, lived by the coordination in 8 out of the 13 campuses that offer the Graduation in Mathematics, show that, for just three coordinators, going through the evaluation process marked them without narrating the specific process and its impact on them. Such elements emerge in the conversations of the others. However, regardless of the narrations, it is worth starting with the importance that this evaluative process has for the course, the campus, the institution, and all the players involved, not only professors and students but also as a moment that highlights errors and achievements in both the available infrastructure and, more importantly, in the implementation of the Course Pedagogical Project.

In the statements, in general, one can perceive, between the lines, that everyone emphasizes the importance of this moment and the significant pressure the Coordinator faces, not only in organizing documents, but also in the face of the "never-ending life", they have to "carry the course on their shoulders" to present it to the evaluators, who initially know little or nothing about the entire dynamic that led to the conditions in which the course finds itself at the time of evaluation. Participants I and V highlighted that evaluators can exert strong pressure on the Coordination, and, despite the expected seriousness and rigor, they can make the process even more challenging than it already is or even traumatic.

According to the report of two participants, in particular, the institution did not provide the expected support given the importance that the moment demands. In fact, according to another participant, there was a need for a new evaluation, given that the minimum structure expected for the course were not met in the first evaluation and were still pending a solution (infrastructure item) for the second visit. In addition to this, one participant found himself facing the complexity of this process in the initial period of his coordination. Considering that we are referring to the reality perceived in eight different campuses, and that some years separate the narrated experiences (given the distinct period of the creation of the courses), it is possible to say that the institution needs to pay due attention to the training of these coordinators, as well as to structure itself to provide the necessary support to the course if it is not already doing so (after the data collection).

This attitude would certainly collaborate, at least, with the great bureaucratic demand for document organization pointed out by three participants. A tiring, exhausting function that can be better absorbed if institutional support (and training) occurs before, during, and after the evaluation process. If before, so that there is no accumulation of pending issues to be resolved

in a short period. If during, so that the coordinator can feel supported in the explanations that are necessary, sharing the responsibilities for the mistakes and achievements. And finally, after, so that those who arrive do not have to "start from scratch" and render useless all the experience and wisdom acquired in the process, which can collaborate with the improvement of the course.

In addition to this, the daily demands of the course do not stop. In the words of one participant, everything happened "while I was thinking about the course," meaning that pedagogical and institutional demands were added up to the new challenge, requiring an articulation between the school players, with emphasis on the relationship with the students of the course. According to one participant, "the unconditional support of the students at that moment was crucial for our decent evaluation," support that is achieved, in our view, through a pedagogical approach by the Coordination.

This leads us to the other most frequent theme among the reported facts. For 10 coordinators, from eight different campuses, the Coordination of the Course itself was remarkable, and it is through these reported experiences that we will exemplify how the attributes of Pedagogical Coordination and Educational Management are present in the Coordination of the Curso de Licenciatura em Matemática no IFSP.

Let's begin with the pedagogical aspect of the coordinator's function, surpassing the bureaucratic aspect. As per the narratives of three participants, it is necessary that the coordination activities go beyond the suffocating bureaucracy of each semester, allowing us to perceive that academic management should be "more sensitive to human aspects than to rules and procedures," and, after all, that the Course Coordination should be seen "more from the pedagogical aspect than from the administrative one." This bold stance not only considers these three aspects but also what has been discussed and the perception of the role of formation and transformation that the Coordination has on itself. This is a functional exercise that leads to reflecting on one's own practices, getting more involved with the curricular components related to the teaching of mathematics, and engaging in a process of formation and/or transformation of oneself (and others) that does not occur in the protocol but in an interaction between the professor and students, in a "movement that takes place with the other, a face-to-face process, conversations in the corridor, and students sitting on the floor of the IFSP".

This pedagogical gaze took on a different proportion during the period of the pandemic due to SARS-CoV-2 (Covid-19). The pandemic restricted physical presence in the educational environment and limited interaction between professors and students, both with each other and among themselves. This demanded an extra effort from the Coordination in providing support to professors, once the practices had to be transformed.

The embrace, therefore, not only met the needs of students but also those of the teaching team, as can be observed in the statements of two participants who chose the period of the pandemic as a relevant fact to be narrated because "the articulation of all these activities, as the coordination of the course, is a challenge in terms of learning new tools and ways of articulation between professors, students, and the external community", or still,

preventing student dropout was a complicated task. I had conversations with several students, and one, in particular, who wanted to drop the course, but after our conversation, decided to continue, even though he was only attending to one subject, and even though he had to go to his mother-in-law's house to access the internet.

Such statements reaffirm how the coordinating role is fundamental for the course to remain cohesive with its principles and purposes — and those of the institution — expressed in

the PPC and current legislation, but mainly in the training of the members of the course community or in the transformation of the conditions in which it occurs, both resulting from a pedagogical vision that the professor has about his role in the Coordination. To exemplify, note that a single presentation to the students, about how the "teachers missed face-to-face teaching", impacted students and professors due to the power that the expression of a human gaze has to change the culture and the work environment. In other words, it is the leadership, guidance, and "linking parts together action" developed by the Coordination in the "most diverse personal problems (family, economic, and even sentimental ones)" of the academic community of the course, not directly described in the set of its responsibilities, that impact "academic performance and course attendance".

However, the finding of a participant that "bureaucracy and IF demands", among many responsibilities absorbed by the coordination, are impediments for all of this to occur, compels us to say that Pedagogical Coordination is necessary but not sufficient. It is necessary to assume the role of Educational Manager, as a professor education may be affected by the "modes of operation and management of the higher education system" (Princepe & Pereira, 2018, p. 272).

Nevertheless, one cannot assume that such skills and concepts are innate to the professional, as they require training. According to one participant, there is a need for IFSP, in the midst of reflecting on how bureaucracy consumes the coordination's time and energy, to "provide a training course for elected coordinators". Such a statement corroborates our perception and defense that initiatives for training the management team should be "institutional and systematic," since they are "permanent situations, centered on the university and on the graduation courses", and can also benefit the professional development "of all professors, throughout their careers" (Princepe & Pereira, 2018, p. 272). One type of in-service training that considers the aspects described so far, and others, inherent to course management, which directly or indirectly impact it. The awareness of what is expected and providing specific training for the function assignment will allow the Course Coordination to improve its management.

Taking into consideration the statement of participant T, despite being brief, we have a participatory management, where the act of not singly coordinating is capable of changing the work environment and culture, as well as making the work domain (and, consequently, teaching and learning) pleasant, where problems and difficulties (which will always exist to a greater or lesser extent) will be solved through a democratic process, since "the collaboration of colleagues makes all the difference". Coordinating does not become an individual act, but a collective one, highlighting the "issue of the coordinator's leadership function", which occurs on various fronts. Let us observe some of them, by highlighting the preparation of the PPC (for creation or reformulation) as marks of the period they held the mandate.

The elaboration of a Course Pedagogical Project implies leading a group in the discussion of several elements inherent to the course: the institution's infrastructure (spaces and equipment) that it has (or intends to have), the group of teaching professionals and administrative technicians who will work directly or indirectly in the course, the justification for creating the course and the market demand for graduates, and mainly the pedagogical proposal itself, which includes the curriculum structure, as well as the vision for integrated assessment, research, extension, and internships. In other words, coordinating this process of creating and/or reformulating a Pedagogical Project implies that the Coordination master a broad view of the course, its objectives, the integration between its players, and the articulation between the parts, in collegiate decisions, resulting from discussions and analysis of both the Teaching Structuring Core (NDE) and the Course Board. It is an extremely satisfying and

formative process, but it faced extra challenges when the institution requested the elaboration of a Reference Ementa, as a way to give the same formative identity to each course offered by IFSP, a process that began in 2018 and only ended in 2021 and that, in the case of the Mathematics Graduation, had more than 13 coordinators representing their respective NDEs and Boards, given that some had their mandates ended during the process.

Processes and moments experienced that, through simple narration, express the crucial role that the Course Coordination has in leading the efforts and articulating diverse views, proposals, and interests, as well as mediating conflicts and perspectives, so that expectations align with what is possible. Something that, according to participant J, requires intense work, collegial discussions, and much study, and still, depending on the institution's decision, can generate some type of frustration or, positively, professional development, involvement with the course, and a change in the work environment and culture of the course.

A type of management that engages in academic, pedagogical, administrative, and human relations, areas that invariably present diverse problems, according to the noteworthy facts reported and grouped in this category, as they narrate some situations (distinct from those already exposed) that required the Course Coordination to take a leadership stance. Going through the mentioned problems, we are compelled to categorize them into the two dimensions that we stand for and should be related to the Coordination of the Curso de Licenciatura em Matemática no IFSP: the Pedagogical and the Educational Management. We do not consider them disjointed; on the contrary, we understand that, in the reality of performing the function, both complement and coexist in the same function.

In both the account of conflicts involving teachers and satisfactory performance throughout the course - and why not say the training of future professors for teaching -, we have, in both cases, the Course Coordination in the pedagogical role of articulating different beliefs and convictions of individuals. Remembering, according to Cruz, Garcia, Oliveira, and Bahia (2014, p. 63), that "values are the basic concepts and beliefs of the organization, they constitute the heart of corporate culture", and therefore, as the Course Coordination understands them, it can be inferred that these beliefs, conceptualized as implicit components, guide each individual's choices, underpin their rationalization, representing their perception of reality.

Therefore, as the Course Coordination understands that the professors working in the course possess different knowledge and expertise acquired in their academic training and professional experience (often without the balance of the theoretical model), laden with personal beliefs about teaching, the function of the mathematics professor trainer (distinct from the trainer of other professions) and the institutional function demanded of them, it is incumbent upon them to recognize that the exercise of their function makes them the trainer of their team, in order to transform the work environment, culture, and institutional environment in which the course develops.

It is the responsibility of the Course Coordination, in the exercise of its pedagogical function, to guide teachers and students in a formative process that culminates in the understanding of the expected professional and social function—from the PPC, current legislation, etc.—of future mathematics professors and their trainers. Such a posture implies understanding the potential of their transformative function in institutional culture, based on the recognition of their scope as an Educational Manager.

If four participants report how structures and external agents to the direct daily life of the course impact relationships and the course's own conduct, it is necessary to take a position over interferences, harassment, and omissions that transcend the pedagogical, in a leadership that strengthens human and institutional bonds, based on the exercise of a function in a logic

different from that which uses power. In exercising the educational management of the course, the Coordination has the ability to establish (and/or alter) the institutional work environment and culture through democratic and participatory relationships, considering education as a human relationship based on caring, "in the most significant sense", which remains attentive to the well-being of others, helping them "grow and update themselves", with an empathetic readiness to perceive, even in a "slight indication, that something is missing from the other, and that intervention is needed" (Almeida, 2012, p. 42).

But it is not only the problems that reaffirm the role of Pedagogical Coordinator and Educational Manager in the function of coordinating a mathematics teaching course at IFSP. There are "Spaces of Learning", positive facts, that marked the participants in the exercise of their mandates because, as two participants well observe, one point of intersection of the pedagogical and managerial dimensions of the Course Coordination materializes in the Laboratório de Ensino de Matemática (LEM). At the same time that its existence in the course reflects a pedagogical concern in the training of future mathematics professors, it also exposes the need for active participation of the coordination so that physical structures are built, adapted, and equipped according to the objectives established for the course.

A set of actions (among others) that have as a reference a democratic and dialogical process with the course community, what demands active participation of professors and students. After all, we are talking about a learning environment of collective and dynamic use, whose relevance and necessity in the training of future mathematics professors are directly proportional to the interaction that professor trainers and students have with the space and resources from the conception of the LEM in the course.

Another element of satisfaction in the exercise of Course Coordination refers to the realization of the Mathematics Week, an example of how the pedagogical and managerial intersect, as it demands articulation between those involved in the event and the course's proposal, in the search for institutional support with time, spaces, and resources for its realization, or even, according to the words of participant H, "the insertion of a practice of greater support and promotion of the articulation of teaching, research, and extension in the course, involving students into different research actions".

In summary, we are talking about perceptions related to the exercise of the function that, combined with the responsibilities, lead us to the existence of an educational management that must be guided by the involvement of the course community under its leadership. It must be attentive to the projected formative profile of the mathematics graduate of the institution.

6 Final Considerations

We conclude the reflections of this article considering that the pedagogical and educational management dimensions allow the Curso de Licenciatura em Matemática no IFSP to identify itself with a leadership that stems from an already established organizational culture and work environment but that must be constantly reconsidered.

In order for both initial training, conducted by the course, and administrative processes that support and sustain the pedagogical activity of the institution to be guided by democratic processes and enable participative management, we can highlight, after the reasoning presented throughout this document, that the two dimensions related to the Coordination of the Curso de Licenciatura em Matemática no IFSP constitute a concept that oversees the pedagogical aspects of the course.

When faced with the need to act pedagogically in response to the demands of professors,

students, and institutional matters, we understand that the importance of educational management lies in integrating all entities of the course into a pedagogical purpose. This is a type of professional stance that differentiates it from the practice of teaching and requires the institution to take actions that foster and formalize training spaces specific to the responsibilities of this function, allowing, from the perspective of teaching, transitioning between management and pedagogy.

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