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The argument of mathematical modelling and the construction of the mediator-mentor teacher in the Brazilian scenery: engendering a network of knowledges

Betina Cambi
Universidade Federal de São Carlos
Poços de Caldas — MG, Brasil
✉ betinacambi@yahoo.com.br
0000-0002-1766-022X

Ademir Donizeti Caldeira
Universidade Federal de São Carlos
São Carlos — SP, Brasil
✉ mirocaldeira@gmail.com
0000-0003-0290-9851

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Abstract: It is our purpose, with this article, to discuss the statement "*while developing Modelling activities, the teacher is no longer a transmitter but becomes a mediator-advisor in the teaching process*" with regards to the mediation-advising practice in the sphere of Mathematical Modelling, which is considered from a discursive dimension. The theoretical-methodological inputs are linked to the philosopher Michel Foucault's theorizing, in the form of discourse, enunciation and statement. The analytical material, from which the aforementioned statement emerged, covers those theses and dissertations presented in the period of time between 1976 and 2016, which relate, describe or discuss the development of Modelling activities in the classrooms of Elementary Education. Analyses show that, with the rise of a teacher representation that is associated with mediation-advising, a set of new practices is engendered as ground for the action of mediation-advising which, by now, differ from the set of practices for the transmission of understanding, activating multiple knowledges by the teacher developing the Modelling.

Keywords: Mathematics Education. Teacher Representation. Teaching Practices. Discursive Practices. Meaning Mechanisms.

El discurso de la Modelación Matemática y la fabricación del profesor mediador-consejero en el escenario brasileño: la generación de una red de saberes

Resumen: El objetivo de este artículo es problematizar el enunciado "el docente, al desarrollar actividades de Modelación, deja de ser transmisor y se convierte en mediador-orientador en el proceso de enseñanza" en relación a la práctica de la mediación-orientación en el contexto de la Modelación Matemática, lo cual se entiende desde la perspectiva discursiva. Los aportes teóricos-metodológicos están vinculados a las teorías del filósofo Michel Foucault, como discurso, enunciación y enunciado. El material analítico, del que surgió el enunciado mencionado, abarca tesis y disertaciones defendidas desde 1976 hasta 2016, que describen o problematizan el desarrollo de las actividades de Modelación en el aula de Educación Básica. Los análisis mostraron que, cuando emerge la representación docente asociada a la mediación-orientación, se engendra un conjunto de nuevas prácticas que sustentan la acción de mediador-orientación, las cuales, ahora, se diferencian del conjunto de prácticas de transmisión del saber, con lo activación de múltiples saberes por parte del docente que desarrolla la Modelación.

Palabras clave: Educación Matemática. Representación Docente. Prácticas de Enseñanza. Prácticas Discursivas. Mecanismos de significado.

O discurso da Modelagem Matemática e a fabricação do professor mediador-orientador no cenário brasileiro: o engendramento de uma rede de saberes

Resumo: O objetivo deste artigo é problematizar o enunciado "*o professor, ao desenvolver atividades de Modelagem, deixa de ser transmissor e passa a ser um mediador-orientador no processo de Ensino*" em relação à prática da mediação-orientação no âmbito da Modelagem Matemática, a qual é entendida a partir da perspectiva discursiva. Os aportes teórico-metodológicos vinculam-se às teorizações do filósofo Michel Foucault, como discurso, enunciação e enunciado. O material analítico do qual emergiu o enunciado citado abrange teses e dissertações defendidas no período de 1976 a 2016, as quais descrevem ou problematizam o desenvolvimento de atividades de Modelagem em sala de aula na Educação Básica. As análises mostraram que, ao se constituir a representação docente associada à mediação-orientação, engendra-se um conjunto de novas práticas que sustentam a ação de mediar-orientar, que, agora, diferem-se do conjunto de práticas de transmissão de conhecimento, com o acionamento de múltiplos saberes por parte do professor que desenvolve Modelagem.

Palavras-chave: Educação Matemática. Representação Docente. Práticas Docente. Práticas Discursivas. Mecanismos de Significação.

1 Mathematical Modelling: establishing a scenario

The purpose of this article[1] is to discuss the statement "*while developing Modelling activities, the teacher is no longer a transmitter but becomes a mediator-mentor in the teaching process*" regarding the part played by the teacher associated to the meditating-mentoring practice in the sphere of Mathematical Modelling[2] in the Brazilian scenario.

In Brazil, Mathematical Modelling is a consolidated field of research, with vast literature organizing the possibilities for its development, theoretically and methodologically. The process for the establishment of such scenario is a historical process that marked the end of the nineties and came from movements for change centered on curricular organization and formulation (Quartieri & Knijnik, 2012). Such changes have been boosted by the realization that the teaching of mathematics was in a crisis. Two routes initiated such perception, as Magnus (2018) puts it: the first one is that mathematics is a difficult subject and, the second, that it is distant from students' reality, encouraging change in the system of mathematics teaching, preparing the grounds for Modelling to emerge.

Thus, Modelling in the Brazilian context encompasses different lines of research that are linked to processes of development and implementation, as well as to aspects related to the parts played by teachers, students, curriculum, school and, also, interweaving with philosophy and with semiotics, where the mathematical and non-mathematical signs expressed by the students act as instruments of communication and reveal thoughts and actions (Silva & Veronez, 2021).

The text is a contribution for the development of Mathematical Modelling in Mathematics Education especially as it makes it evident that the procedures adopted by students

[1] This study is built on the doctorate thesis by the first author student, accomplished under guidance of the second author, in the Post-Graduation Program in Education at the Federal University of São Carlos.

[2] The term Mathematical Modelling will be used from the perspective of Mathematical Education, mentioned simply as Modelling, along the text.

for the development of this kind of activities are mediated by the use, interpretation and production of a variety of interpretations here related as signs.

However, the different lines of research present ideas that converge to a mindset unity - referred here as discourse unit - in relation to that which constitutes as Modelling itself. In other words, there is unity in relation to the forms that constitute it, since it is through the mathematical language of a problem raised from the reality of the student that the central aspect for the development of Modeling activities is characterized, along with the displacement of the teaching process from the teacher to the student (Caldeira, Costa & Cambi, 2020).

An alignment with ideas of reform can be observed, ideas that set the educational field in motion within a more globalized scenery, where, according to Valoyes-Chávez (2018), discourses for the reform of mathematics defend teaching that is centered on the student, where the part played by the teacher is that of a mediator observing the activity in the classroom in order to guarantee that learning is actually happening, encouraging discussions that challenge students' ideas.

Having said that, in order to discuss what is proposed we have taken Modelling into account, from a discursive perspective: its constitution is engendered from a set of statements operating towards the construction of truths related to different aspects such as the teaching profession, the teaching of mathematics, the student, and learning, for example. From such analysis, based on Michel Foucault's theorizing, Modelling, as scientific discourse, will operate on the systematic formation of those objects it deals with (Foucault, 2008).

In this regard, the very discourse of the Brazilian Modelling, brings about the need for a new teacher and for a new practice so that changes in the teaching systems can be implemented. Now, the new teacher is associated to the practice of mediating-mentoring, operating towards a process for the creation of what comes to be the very practice of mediation-advising, as well as what comes to be the mediating-mentoring teacher. Such movement can be understood as a consequence of the eruption of the movement for the reform of mathematics in schools, which made the onset of multiple discourses related to the teaching of mathematics possible by building different teaching subjectivities (Valoyes-Chávez, 2018).

Thus, Modelling, as a discourse accepted and legitimated in this game with scientific rules, performs its authority in the scenario of statements and it establishes what is true, since there are several mechanisms related to discourse, that regulate, control, select and distribute what can (or cannot) be said, attributing "specific effects of power to the truthful" (Foucault, 2011, p. 11).

So a process is articulated, where the teacher is objectified, in other words, objectification practices are established, which rise from "modes of acting, feeling and of being a subject" (Freitas, 2012, p. 188), being a teacher-subject in Modelling. Characteristics and skills, that compose the mediation practice where the teacher appears as an object of the knowledge relationship established by those characteristics and skills. Modelling, in its authority as scientific discourse, "recruits, summons, impels the individuals to become subjects in their own fashion" (Freitas, 2012, p. 188). Thus, those practices of objectification of the individual lead to "practices that divide" (Castro, 2016, p. 408), which is to say, practices that separate teachers into those that are mediator-mentors and those that are non-mediator-mentors.

Modelling, thus, organizes and defines, discursively, not only the part played by the teacher, but the very mechanisms for such part to be played. This is possible, for the Modelling discourse, which follows educational discourse, operates so that certain statements related to

the teacher and to their practice occupy their place as truths amidst educational discourse, since truth is based on institutional foundations such as pedagogical practices (Foucault, 2014).

From such perspective the questions arise: how is the teacher constructed in Modelling? Which knowledges are expected so that the teacher is a mediator-mentor? What is the net of mechanisms that get the practice of mediation-advising started in the sphere of Modelling? The intention, with such questionings, is to discuss a few mechanisms that are set in motion by the onset of an association between the mediating-mentoring practice to the figure of the teacher.

By making this discussion visible the intention is not to establish the definition, the essence of what mediation-advising is, or the way it can be developed; or even to establish a definition of what a mediator-mentor teacher is. On the contrary. The intention is to bring visibility to that which Modelling itself, as discourse, acknowledges, welcomes and propagates as mediation-advising and/or as mediator-mentor teacher, seeking to understand what those mechanisms are and what they can represent in the process of teacher formation on Modelling.

2 Methodological strategies: from *corpus* to the emergence of the statement

For the development of studies, the way in which scientific sayings related to the part played by the teacher engaged in Modelling has been analyzed as to how they operate for the production of manners of being and thinking Mathematical Modelling among teaching professionals in the Brazilian context. Thus, the material for our analysis is the set of Brazilian theses and dissertations produced in the period of time between 1976 and 2016, more specifically works that describe, relate or discuss modelling activities developed in classroom. Such cut-out was stipulated because, according to Silveira (2007), the pioneering record of an academic production on Modelling from the perspective of Mathematical Education dates from 1976; and 2016, on its turn, was when we started our research. The *corpus* composition has six theses, 37 dissertations of academic master's degree and 62 of professional master's degree.

Such as Kolloschel (2015), we understand that researches on Mathematical Education also become objects of study, since they work as an institution with their own regimes of truth, division practices, conduct and subjectivation techniques.

From such perspective, Foucault's theorizings are the theoretical-methodological foundations of our study. With the analysis of discourses, we examined that which has been said, for "the restlessness before what is the discourse in its material reality, a thing pronounced or said" is what is at stake (Foucault, 2014, p. 8). So, a work has been undertaken, which examined the written material reality of academic scientific discourses, in order to analyze the statements related to the part played by the teacher on Modelling activities.

In this process, we need to rework our understanding about documents - thesis and dissertations -, moving on to comprehending them from a perspective of monument-document. According to Le Goff (1990), documents are understood from a positivist perspective, in which the files are inert matter, have a character of undisputed truth, for reconstruction of the past - for memory. The idea of monument-document comes to break such premise, to enlarge the understanding. For the author, the document is not "anything on the account of the past, but a product of the society that created it according to the relations of force that held power in it" (Le Goff, 1990, p. 545).

Thus, understanding documents as monuments means to question with grounds on a critical dimension, in which it becomes necessary to find the conditions for their historical production and, in that way, their unconscious intentionality (Le Goff, 1990).

From this very perspective, Foucault (2008) suggests that we look at the documents as monuments, placing in suspension the existence of a system for the reconstruction of the past, in other words, a homogeneous system through which the history of Modelling went, questioning the document from a critical dimension in which there is no historical reality finished.

Thus, it was in this regard that we reworked and reorganized our analysis procedure, so that, for the process of mapping the statement, we treated theses and dissertations as monuments, without the role of reconstruction of the past or of establishing absolute truth. This means that the monument-document (discourse) will "likely be dismantled [...] that it does not have to respect an external serial reality in order to be understood, but it must bring in itself elements with which to build a new series" (Lopes, 2004, p. 141).

Having said that, we proceeded with the mapping starting with the statements presented by the theses and dissertations. According to Foucault (2008) a statement happens whenever a set of signs is issued, for statements are made from them, and they can be comprised of a varied set of statements. Thus, statements have emerged referring to the multiple actions of the teacher who develops Modelling, and they turned out to be recurrent, so the initial work was to structure them. While restructuring them we noticed that recurrences, related to the part played by the teachers, followed two directions: the first one concerned statements making reference to a change of posture by the teachers who chose to develop Modelling activities; and the second concerned statements referring to the consequences generated by this possible change of posture, such as, for example, the need for dedication and study in order to know what Modelling is and how to develop it; the initial professional insecurity that teachers feel when starting the work with Modelling; the need for organization of a new environment in the classroom, as well as the development of another relationship with the student.

When taking such structuring into account, we organized the statements according to their recurrences, so that it would be possible, by means of the discursive regularities related to each of the two directions found, to map the statement emerged from the monument documents departing from the two directions of statements found.

In that way we mapped four statements: one referring to the change of posture by the teacher making Modelling, as "*The teacher, while developing Modelling activities, is no longer the transmitter but a mediator-mentor in the teaching process*"; and three referring to the consequences generated by the change of posture, namely: "*The teacher who develops Modelling needs to know it, to study it, prepare to implement it, and to know the subject of mathematics*"; "*The teacher developing Modelling activities would make it possible for the creation of an environment of freedom, creativity, autonomy, encouraging reflection*"; "*the teacher feels difficulty and insecurity while developing Modelling activities*".

For this article, our problematization refers to the statement "*The teacher, while developing Modelling activities, is no longer the transmitter but a mediator-mentor in the teaching process*" since we understand it works as a principal statement, namely, the other three mapped statements derive from it, in a kind of branch derivation circuit. (Foucault, 2008).

By having the statement mapped, as Foucault (2008) puts it, the problematization will depart from the statement itself, which is a methodological tool for analysis understood as an event, taking a stand that is singular, unique and rare. To think the statement as an event is to grasp it as an occurrence that gains "body" from the process of its enunciation, and which is not linked exclusively to the place and time of its enunciation but is "*linked to the institutions in which they become occurrences, in which they become events*" (Vilas Boas, 2002, p. 62).

In this regard, the principal statement is an occurrence that gained body from the process of its enunciation, from the fact that it has been "produced by a subject at an institutional place, determined by socio-historical rules that define it and allow it to be stated" (Gregolin, 2004, p. 26). The principal statement, therefore, is an occurrence articulating with other events, which can be of a discursive nature or of a technical, practical, political, social nature, such as it happens, for example, with occurrences that embody the monument-documents through the rearrangement in the classroom when Modelling is applied; with curricular reorganization; with the reorganization of the relationship teacher-student; with the practical, didactic and pedagogical changes; with the problems/difficulties faced during the development of Modelling activities; with the formation of teachers; with the competence and skills of teachers.

In that sense, the purpose is not to narrate each of these occurrences, but to learn them as single possibility of analysis, with the perspective of studying them as events that produce truths about the Modelling teacher from the moment when something is said or practiced either in school institutions or other institutional places.

3 The mechanisms of signification on the engendering of a network of knowledges

Developing Modelling activities requires reconstruction not only of the classroom space, but of the whole set of pedagogical actions that go through student and teacher, which will be responsible for such reorganization. The mediation-advising practice lies in the core of this reorganization, from which it derives, boosted by the Modelling discourse itself, strategies that are regarded as support for such practice and of paramount significance for the teachers to become mediating-mentors.

Thus, the mapping of two discursive movements that grant visibility to those strategies are here presented. Let us now consider the enunciations mapped with regards to the first movement:

> The teacher adopts [in Modelling] the posture of offering support, as the conflict provocateur, assistant on the systematization of pedagogic activities in a school environment. [...] For such, the teacher must broad and deeply master the Mathematics subject contents and, simultaneously, show to have the skill to adequate the teaching method to the topic under research. (Martinello, 1994, p. 128)
>
> To break this curricular linearity [put in place by Modelling] requires, from the teacher, great mastery of [mathematical] subject, confidence and creativity for the development of work. [...] For such, the teachers, apart from having the courage, must be willing to review theories, openminded in regards to new ideas and engaged in their quest for new developments (Brumano, 2014, p. 77, 78).
>
> Amidst this [Modelling] environment, the teacher must not work on contents in an isolated manner. The teacher needs, also, to know maths and relate it to the social environment. Such strategy requires from them study and availability to learn and work with mathematics. (Carmo, 2014, p. 32)

In this movement the statements grant visibility to the *know-how* of the *teacher* that relates to those knowledges a teacher needs in order to become a mediator-mentor. It is necessary that teachers develop and deepen their knowledge of Mathematics, as well as Modelling itself; and that they know the new requirements for the classroom - decentralization of the teaching subject - the student is the focus.

Let us now see the enunciations mapped with regards to the second movement:

> Educational practice with the use of Mathematical Modelling seems to favor creativity, since the teacher must provide, upon developing their work, for freedom so that the students can establish their own strategies, favoring intuition, fantasy, and the experience of solving a problem-situation (Burak, 1987, p. 34).
>
> [...] the teacher must [on the activities of MM] be prepared to propose, guide, follow and give technical support to students. This will require from the teacher willingness to study and learn and, thus, courage to deal with what is new and to face challenges. For such, a favorable environment is necessary, one where the exchange of experience, reflection, discussion and critical analysis is regarded as relevant (Ferreira, 2003, p. 258).
>
> In this environment, built for the practice of Modelling, apprentices become responsible for the process of teaching and learning. [...] The teacher, mediator of such a scenario, will mobilize them into establishing more active and independent postures, developing reflexive knowledge, as well as fostering initiatives that converge with this purpose (Pagung, 2016, p. 36).

In this movement, the statements grant visibility to the *teachers actions*, those related to attitudes, behaviors, conducts that need to be developed in the classroom so that the teacher becomes the mediator-mentor. This movement is characterized by the implement of investigative processes and of dialogue, which work as “bridges" allowing the teacher to develop, in the student, reflexion, criticality, freedom and autonomy.

In that way we can say that there is the possibility for creation and setting up of strategies, used at the discursive field of Modelling, that define *mechanisms of signification*, which assign meaning not only to the practice of mediating-mentoring, but to the teacher’s practice in Modelling itself. This is only possible because the exercise of power in Modelling "happens by building knowledge, producing discourse, establishing truths [...] and in this discourse, power and knowledge are not external to each other; they operate in a mutually productive way” (Bampi, 1999, p. 127).

The engendering of *mechanisms of signification*, thus, grant visibility to two processes: the first one consists of the teacher’s need to seize specific knowledges - *knowledges* of the *teacher;* and the second, in which there is, from the empowerment of such knowledge, a possible process of transformation of the teacher - *teachers actions* - which would allow transformation from a transmission practitioner into a mediator-mentor.

Therefore, the *mechanisms of signification* establish a new set of practice, which, now, supports representation of the teaching figure associated to mediation-advising in Modelling, and this set rises from the redirection of posture of a transmission practitioner into a mediator-mentor of knowledge.

In this sense, this new set of practices is engendered along with the statements derived from the principal statement: “the teacher developing Modelling needs to know it, study it, prepare to implement it, and know the Mathematics subject; “the teacher, while developing Modelling, would allow the creation of an environment of freedom, creativity, autonomy, fostering reflexion”. This happens due to the nuclear character that the statement teacher-mediator-mentor assumes in Modelling, allowing statement ramifications, which express rules of formation that are more defined, more specific. In other words, they express exactly the consequences generated by the teacher’s shift of posture; they express the new requirements that follow the need for the teacher to mediate-mentor the knowledge and no longer transmit it. In this way, the derivative statements gain power as a truth that is produced and they become consolidate by means of the discursive net that is created.

Backed by this discursive net we noticed the displacement of such way of being and thinking the teaching practice in formative processes, the inicial as well as the continued formation; or in the field of education or of mathematical education.

Let us see the enunciations in the field of teachers formation in the broad sense:

> A teacher is, necessarily, a researcher, in other words, a professional of knowledge reconstruction, as much in the horizon of research while scientific principle as, and above all, while educational principle. [...] Being a teacher is, substantially, 'making the student learn', starting from the notion that they are the evidence of a successful learning. Only the teacher who learns well can make a student learn (Demo, 2004, p. 80).

> It is certain that the autonomy and responsibility of a professional depend on a great capacity to reflect on action and over action. This capacity is the core of a permanent development, fruit of experience, of competence and of professional knowledges. When the professional practice is taken into account from the perspective of specialization and intelligence at work, the thoughtful professional is key to professional activity. In this case, the teacher is seen not as merely a technician who reproduces what is passed on to them, but becomes someone capable of thinking, reflecting and deciding the best way to take when facing situations that happen in the school environment (Oliveri, Coutrim, & Nunes, 2010, p. 298, 299).

> The researching teacher and the reflecting teacher, deep down, correspond to different trends (concepts) in order to say the same thing. They are different names, different manners for theorists in pedagogical literature to approach the same reality. The reality is that the researching teacher is the one who researches or who reflects over their own practice. Therefore, here we are inside the paradigm of the reflective teacher. It is evident that we can find dozens of texts to explain the difference between those concepts, but I believe that, deep deep down, they are part of the same movement of concern with a teacher who is a questioning teacher, a teacher who takes on their own school reality as an object of research, as an object of reflection, an object of analysis (Nóvoa, 2001, p. 1).

Let us also take a look at the enunciations regarding the formation of mathematics teachers:

> We understand the teacher-researcher as the one who handles research as an act of building up new ideas and understandings, in other words, an act with the result of learning. Research can generate new knowledge regarding their students' mathematics, regarding the reality of their classroom, regarding their pedagogic practices, regarding the quality of their curriculum, regarding mathematics itself, or regarding the learning of mathematics. These are but a few examples of what a teacher-researcher can modify in their process of understanding as a result of research (D'Ambrosio & D'Ambrosio, 2006, p. 9).

> The researcher teacher is the one departing from issues related to their practice, with the purpose of improving it […] Research by the teacher seeks knowledge of the truth, in order to transform it, so as to improve pedagogical practices and the teacher's autonomy (Garcia, 2009, p. 177).

> The future teacher of mathematics must learn new mathematical ideas in an alternative way. The learning of subjects such as calculation, algebra, probability, statistics, geometry, in higher education, must be carried out with view to investigation, the resolution of problems, to their application, as well as with the historical, sociological and political analysis of the development of the subject. This requires new perception by the mathematicians as to how mathematics is learnt, which is far beyond the

> concern of many. One suggestion is that the content, in higher education, gets revisited in other subjects. Subjects whose purpose is the identification and resolution of problems and personal reflexion by each student over their own process of learning. Such goals, especially the resolution of problems and a refection over the learning, are non existent in many formation programs (D'Ambrosio, 1993, p. 39).

At last, let us see those enunciations that relate to the formation of teachers in the filed of Modelling:

> [...] when it comes to change, it is important that the teacher has a chance to reflect and discuss the goals they want to achieve. [...] Our proposal for continual formation is meant to generate an environment that favors the exchange of experience and reflection over the practices of teachers especially in what relates to those influences that Mathematical Modelling brings to teacher formation, when the latter uses it as teaching strategy (Dias & Almeida 2004, p. 8).
>
> Being a reflective teacher is more than being a "thinker" according to Perrenoud (2002), it is rather a question of being a professional who is aware of what they do, how they do it and why they do it. Someone with competence to articulate scientific knowledge and pedagogical practice, as two sides of the same coin, for the development of their students (Rosa, 2013, p. 4).
>
> The emphasis, with this argument, is not that the responsibility for the formation of teachers is exclusive of those professors who work on graduations. It is rather the case that such professors need to seek alternatives that allow for a meaningful initial formation, in the same way that a process of teaching and learning is required, from those teachers in Basic Education, that offer their students more than the memorization of formulas and procedures for the resolution of an exercise *(Tambarussi & Klüber, 2016, p. 138).*

Enunciations are fed by different voices that concern the field of teacher formation, the formation of mathematics teachers, as well as the formation of teachers on Modelling from which *research* and *reflection* emerge as fundamental elements of the teaching practice.

In this direction, *research* as well as *reflection* about the practice itself work as *strategic elements to the mechanisms of signification*, for by their means, transformation of the teaching practice would be possible. This transformation process becomes materialized *by* and *in* reflection, which "guides the individuals to acknowledge themselves as subjects of their own actions" (Bampi, 2003, p. 110), making it viable for the production "of an experiment of themselves inasmuch as it guides the individuals to reflect, to question themselves, regulating and modifying themselves" (Bampi, 2003, p. 112).

Through these elements the teacher would take an active stand, of autonomy, *consciously* questioning and placing challenges to themselves, regarding *what they do and why they do it*. In this way, *will* is expected from the teacher, a *desire* for furthering conceptual development, for studying, for learning; for facing those challenges imposed by a new posture when dealing with the process of teaching; the teacher is expected to have will and a desire for owning knowledges that activate the practice of mediating-mentoring and transform not only the teaching practice but the very teaching constitution.

Such way of thinking the practice of teaching can be seen as an effect of the fact that the teaching profession is sensed as a constant process of improvement, reinforced, legitimized and materialized especially by the courses of continued formation. The teacher is no longer the transmitter of knowledge, no longer takes central position, therefore their professional improvement will occur under this perspective.

When the part played by the teacher is dislodged, the set of practices through which the process of teacher formation is established, also shifts, so that the "creation" of “spaces for reflexivity" leading to an “opportunity for self-critique”, becomes necessary (Bampi, 2003, p. 110).

The teacher who doesn’t take ownership of tese *strategic elements of reflection* and of research becomes a passive subject who does not question their own practice, who does not allow themselves to learn or develop different pedagogic paths, creating a space for “dual thinking, [...] two different extremes: resting now on ‘a' and then on ‘a-not'.” (Santos, 2018, p. 126).

Thus, we can think *reflection* and *research* as elements that divide teachers between those who implement and take ownership of them as elements that constitute their practice and, thus, are capable of better develop professionally; and those who did not take ownership of such elements and did not implement them into their practice, which can turn the teacher into a professional who does not correspond to the new needs of the profession, giving space to marginalization. Those truths produced by the teacher, now mediator-mentor, establish representation of the teaching professional and exclude those who do not resemble the model of teacher required in the field of Modelling.

In this way, *reflection* and *research* as *strategic elements* that constitute the teaching profession in Modelling, places the teacher who takes ownership of such knowledges in a position of authority, granting visibility to the feature of power on the Modelling discourse. It cannot be forgotten that the Modelling discourse is made of "texts addressed to teachers and that it has been guiding their pedagogical practices; that they are released and consumed in courses of teacher formation” (Bampi, 1999, p. 126), making it possible for a kind of empowerment operated through the production of knowledges that rupture with “universal discourses and is compensated by other that strengthen it” (Bampi, 1999, p. 127).

Besides, enunciations give visibility to the idea that, *in order for the student to learn well, it is supposed that the teacher knows how to learn*; for once the teacher places themselves in a position of taking ownership of mechanisms that allow them a greater professional development, the better they will teach their students. The concept is highlighted, that for the development of the teaching practice, articulation with the practice is as important as the previous formation, which allows the teacher to develop new ways of carrying out their pedagogical work based on investigative and reflective processes over the practice itself.

Enunciations show us a shift from education requirements of student formation to education requirements for mathematics teacher formation, by means of the argument that *in order to stimulate reflexivity we consider it important that the teacher develops actions that bring them challenges as an opportunity*. And, likewise, educational difficulties and lag in the basic teaching of mathematics can be overcome by the development of Modelling, since the teachers also need substantial initial formation, one that is not grounded *on the memorization of formulas and procedures for the solution of an exercise*. This expected formation can be developed, therefore, through Modelling. Besides, by working with Modelling from the start of their formation would be a way for the teacher to know it then, to study it, which would make its implementation in class easier and make the teacher more confident to develop it.

In that way, "many subjects in the enunciations presented, upon accepting them as truths, they also signal the existence of concern regarding the formation of teachers", (Góes, 2015, p. 136), which is legitimated by the enunciations. It is expected that the teaching professionals are also formed by experiences that allow them to question themselves and their way of teaching. In other words, the teacher must be given the same opportunity desired for

their future student: that they become capable of *building up their own knowledge*, their learning, relating the mathematical and pedagogical knowledges with the intent of forming professionals that are critical. Thus, "standards are made legitimate, standards with the actual purpose of "re-transforming" the teachers into individuals [...] that are strengthened, autonomous and personally flexible" (Popkewitz, 1999, p. 116), with capacity for self-management.

Thus, while looking upon the establishment of a network of knowledges we notice that the practice of mediation-advising is made of *mechanisms of signification - techniques* - such as teachers-researchers, reflective-teachers, active-teachers, autonomous-teachers, critical-teachers: researchers, so that they have an understanding of their students and of their practice; reflective so that they think the practice over; critical so that they question the part played by mathematics, by the curriculum, and so that they organize their planning; active to search for new knowledges and go deeper into the ones they have already amassed (self-management); and autonomous so that they do it themselves, and have initiative, and take decisions.

The teacher, in Modelling, is not only represented as the one who intermediates between the object of knowledge and the student, and who constructs interventions for the student to build their knowledge. The teacher developing Modelling is a professional constructed from a discursive multiplicity: "reflective-teaching, critical-teaching, collaborative-teaching, constructivist-teaching, [...] which prescribes, rules and generalizes the conduct and recurs and remains fixed in identity" (Santos, 2018, p. 127).

Thus, discursive multiplicity that trespasses the mediator-mentor teacher opens up enunciation possibilities over uncertainties, difficulties, insecurities that surround the teacher along their process of formation. When faced with challenges, with situations that make them "come out of comfort zone", a set of conflicting sentiments emerge.

With that, the enunciation "*the teacher feels difficulty and insecurity when developing Modelling activities*" is peripheral to the enunciations according to which "the teacher who develops Modelling needs to know it, study it, prepare themselves to implement it, and to know the subject of mathematics"; and "the teacher, when developing Modelling, enables an environment of freedom, creativity, autonomy, fostering reflection", making it possible that one of the effects on the teacher when developing Modelling due to redirection of the teaching posture becomes visible.

With the monumental reading of the empirical material we noticed that different elements operate towards insecurity for teaching professionals. Part of those elements correspond to the structure of the school in general, such as *curriculum organization*, the coverage of curriculum contents, the traditional way in which the school is structured; the other part, corresponding to the lags on the *initial formation of the teacher*, which does not correspond to a multifaceted formation which, as we have seen it, does not allow the future teacher to construct their own knowledge or receive a more significant formation. And, at last, there is the part that embodies the feeling of the teacher themselves, of not owning the necessary knowledge to assume a change of posture and develop Modelling, namely, the teacher does not feel secure, for knowledge is power: without the necessary knowledge, the empowerment provided by knowledge itself is non-existent.

The teacher, thus, upon recognizing themselves in the enunciation "*the teacher, while developing Modelling activities, is no longer the transmitter but the mediator-mentor in the process of teaching*", when they assume it as their own truth, when they are in the position of enunciating it, they will suffer the effects that such acknowledgment causes: insecurity for the

development of Modelling activities, or in other words, insecurity to become a mediator-mentor teacher.

In this regard, the theory of discourse is intrinsically related to the construction of the subject, since subjects are not “the cause, they are not the origin of the discourse, but discourse effects" (Pinto, 1989, p. 25), in other words, the construction of the mediator-mentor teacher subject in Modelling is an effect of the Modelling discourse itself. With that, the discursive effect of the mediator-mentor is much more substantial than we expect, for the way in which the teacher is constructed as a mediator-mentor is beyond those actions that materialized through some “concrete" or specific activity, or rules to be followed; the teacher comes across subtleties - discursive and non-discursive issues - such as eloquent looks, scarce dispositions, objects that are not wanted for that practice” (Fischer, 2012, p. 106), expected behaviors, subtleties that are absolutely naturalized within a school environment.

The whole set of practices involving mediation-advising could also be understood from a perspective that seeks to promote an improvement in education, or in the professional life of teachers, granting the teacher more autonomy, more freedom. However, a discursive net is what sets in where there is dispute over how the teacher should be in Modelling, there is desire for control over the teaching practice, so that, in such dispute, processes occur in which whatever discursive manifestations that are not in line with this desire, are erased.

Given this, the teacher is a discursive construction, emerging as a truth that is linked to a certain historical reality established over some practices, as mentioned by Veyne (1982, p. 163): “each practice, in the way history makes it, engenders the object that corresponds to it [...] objects are but correlates of the practices.”

Hence, we cannot view the teacher who develops Modelling as *“The”* mediating-mentor teacher seeking after a fixed and natural identity, for the mediation-advising issue is a question of historial construction. It is through those practices that the Modelling teachers settle their convictions and are taken by them. This means that a subject is defined - the teacher - and the place for such subject is defined - that of a mediator-mentor - and that place is the site of truth, which defines their stand and rules their action. Any other positions or teaching stands are refused, and that which sustains it is welcome.

Final Considerations

By making such analysis, we gave visibility to a few modes of objectifying a mediator-mentor-teacher, a subject conceived by discursive practices in scientific productions that have for purpose the establishment of a multifaceted subject: researcher, thoughtful, creative, autonomous, willing to learn, critical, collaborative.

In this way we showed that, with the intention of producing such subject, there is urgency and the engendering of knowledges - *mechanisms of signification* - which are set in motion by Modelling when the teaching figure is established as a mediator-mentor, highlighting the elements of *reflection and research* as strategies that enable the transformation of the teaching practice. It is our understanding that the *mechanisms of signification* are composed as necessary and sufficient condition to produce the mediation-advising practice in Modelling. Accessing them is conditional for the teacher to think and transform their practice. With that, the mediation-advising practice becomes legitimated by the modelling discourse, as teaching knowledge that is essential for the teacher to re-establish their stand in the classroom.

Hence, we have questioned the effects of truth and power in Modelling discourses and in the sphere of the teaching practice. We have asked ourselves as to what are the mechanisms and strategies through which the Modelling discourse "performs its productive exercise" (Bampi, 1999, p. 116), and acts in order to construct the subject teacher, so we don't relapse into the fixed idea of mediation-advising representation, thus guaranteeing the infinite continuity of this discourse, and legitimating the identity of the teaching professional.

Besides, apart from the Modelling discourse, there is an engendering of other "places" and "voices", exterior to the Modelling field, which end up legitimating the representation of the teacher-mediator, namely; continuing education courses that offer new methodologies, new educational practices that become necessary given the social changes; the political realm in relation to public policies with external evaluations that qualify and sort the performance of students and teachers, rewarding those who correspond to their ideals of education; institutions such as the State Department of Education, which impose ideal techniques to the teaching processes, thus aiming for an ideal in education; higher education institutions which also create their discourses regarding education processes and the teaching profession; the media which create and reproduce an education and teaching discourse when displaying the social complexity we live in thus "reporting" teaching of a low quality and reinforcing the idea of educational renovation and renovation of the teacher themselves; or still, when reinforcing the idea of technological developments and of how the school, in order to improve quality in education, should incorporate and take advantage of technologies; the industrial end economic sector developing applications and technologies for education with ideas of changing it and getting better student-teacher interaction; advertisings that communicate an image of schools and teachers that are "modern", technological and flexible.

Thus, discourse about the teacher can be found in those spaces and is organized through them, which sends us to the thought that the teacher who is associated to mediation-advising is created, re-drafted *in* and *by* the present, reconfigured by the historical conditions that surround them *today*.

We cannot ignore the fact that Modelling is one of the fields that takes a stand as "education, formation and life-leading *locus*" (Fischer, 2012, p. 113) for teachers, which impacts on school practices, on further education courses, in teacher-student relations, reasserting and legitimating "ways of being and existing in the world" (Fischer, 2012, p. 113).

That is the reason why, looking at the teacher in Modelling is important, from a perspective of discourse, for the further consideration of those effects that such discourses operate in the teaching careers, as well as in the processes of initial or continued formation: how to look at the processes of teacher formation departing from the idea that we are effects of discourses?

And, moreover, such look is relevant for us, teachers, to reflect on the practices we develop in class and on Modelling practices, as well as on the relationships established between, for instance, teacher and student, teacher and knowledge, teacher and school.

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