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Interdisciplinary Practice of the Prospective Mathematics
Teachers**

**Jenny Patricia Acevedo Rincón
Phd Candidate
Education Faculty
University of Campinas
Brazil**

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Athens Institute for Education and Research
8 Valaoritou Street, Kolonaki, 10671 Athens, Greece
Tel: + 30 210 3634210 Fax: + 30 210 3634209 Email: info@atiner.gr URL:
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The Professional Learning situated in an Interdisciplinary Practice of the Prospective Mathematics Teachers

Jenny Patricia Acevedo Rincón
Phd Candidate
Education Faculty
University of Campinas
Brazil

Abstract

The prospective teacher courses proposed to the future mathematics teacher at the University of Campinas (Brazil) are developed by the Education faculty and there are some differences compared to institutes. The prospective teacher courses involved in the same class of students of different Education program, forming groups of prospective teacher not necessarily disciplinary. The research of Doctor degree was developed in the course's context: it was the first prospective mathematics teacher course on the Education faculty, with 18 students of the Education program from subjects such as Chemistry, Physics, Mathematics, History, Philosophy, Geography, Literature and Arts. We believe that the Prospective teacher Course is an interdisciplinary course because the prospective teacher can discuss their own practice regardless the Course to which they belong. Thus, participation in the prospective teacher course allows future teacher to pervade and exceed the boundaries of their own school and academic disciplines of undergraduate courses. However, it is expected that this prospective teacher course in their Education program help them question and negotiate the meanings in situations that can be recognized from their participation in the different school practices. The aim of this research is to interpret, analyze and describe the learning and the professional development of the mathematics prospective teacher in the Education program, situated in an interdisciplinary teaching practice within the first prospective teacher course at the Education Faculty of the University of Campinas. The prospective Mathematics teacher participation in the context of teaching practice aims to discuss and reframe their reification into the different school contexts, opening possibilities for continuous change in their learning situated in analytical and reflective practices. The research is qualitative and uses narrative analyzes under the information produced, to interpret, analyze and describe the learning and professional development of the mathematics students / teachers, situated in an interdisciplinary teaching practice.

Keywords: Community of Practice; Situated learning; Mathematics Teacher.

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Introduction

When we talk about learning, it is common to find it as teaching consequence in educational practices to the interior of an Institution. However, multiple situations exist in those who learned, even out of the lounge of classes. In educational practices, historically, the role of learning has been assumed by students, and, in consequence, the teaching role comes from teachers. Nevertheless, the needs of the educational current system invite to those many practices and identifying different ways for teaching and learning.

To begin, we can admit that not necessarily the one who teaches is a *teacher*, and the one who learns is a *student*. In this respect, the educational practices are admitted inside context of educational institutions that contemplate the relations of an 'authorized' someone who happens to be between a few contents that have been ruled by standardized curricula and a group of students who register to a formal (or informal) system of education. That is, they learn from facing daily problems in some stages of their lives, as well as specific content of the abstract sciences such as the mathematics. Likewise, teachers develop themselves in different spaces, for example in an unplanned meeting or during a pause in the day, they learn from the experiences of other teachers.

Likewise, it is necessary to admit that there are different theories that justify the educative act. Nevertheless, not all the theories receive the possibilities of a learning from daily practices of teaching and learning mathematics. In this respect, the present article tries to approach basic concepts of the Social Learning Theory (SLT). Such theory allowed a group of students about to be mathematics teachers the resignification of the practices of teaching and learning, for having taken part in four scenes of an interdisciplinary formation in the Nicolescu's sense (1999). Later, some of them will be presented as information of research, as result of the learnings that value the need to promote spaces of equality for the different disciplines of Education Program of the prospective teacher as belonging teachers, across the participation to interdisciplinary prospective teacher course of the future teachers in the educational practices, as well as their implications on the professional educational identity. Finally, some of them will problematize some needs inside the educational formation in the professional practices of the students to be teachers.

Theoretical Referential

In the educational practice, it is possible to identify some concepts of educational experiences and/or about learning. In agreement with Dewey (1938), the Experiences are known from a personal and social vision when these are mobilized inside the frames of the continuity; but these ones are not developed in an isolated way, on the contrary, they are wrapped in a set of multiple experiences. We recognize the social nature of the educational practices. The mathematics prospective teachers, as particular case, have been through different educational experiences. The experiences determine the conditions of the prospective teacher

inside practice, for example, to accompany the classroom, or to share practices with other prospective teachers, imply admitting a world of actions, relations and interactions among the participants into the practice. On the other side, the professional educational practice is considered one of the social practice forms, as well as being a pupil in a master course or in the virtual spaces of formation. Hereby, the practices do not develop in an isolated way, but they are part of a system of relations in which there is significance (Lave & Wenger, 1991, p. 169).

The Social Learning Theory (SLT), presented by Jean Lave y Etienne Wenger, admits that learning is developed through the participation in systems “changeable processes of human activity” (Lave, 1996, p. 25). Therefore, where there are actions, relations and interactions among the people in practices, there are possibilities for learning to exist, in spite of interests and the experiences circulating in the heterogeneity of their individualities. The processes into the human activity always guarantee the heterogeneity of the experiences, despite coming from the same side, the negotiation of meanings is individual, is particular to each person. In this respect, the Social Theory of Learning refers to the meaning produced by social interaction, as principal source of production of learning (Wenger, 1998, p. 21). Nevertheless, the meanings are met not only through concepts of mathematics, for example, but also through questions from the school, or people that share this experience.

The meanings mobilized in the different practices, especially the educational ones, answer to different levels of identification, or des-identification with the teaching practice or learning practice that lead to taking part actively, or not, with the members of that practice. From this point of view, the practice of learning is constituted as “participation in changeable processes of human activity” (Lave & Wenger, 1991).

To the Social Theory of Learning, the participation is an important part in the development of the knowledge. The participation considers the “relations set in evolution and constantly renewed” (Lave & Wenger, 1991, p. 50). This way, the knowledge wraps a set of people who interact into a practice and, across the time, constitute unfixed learning, since the knowledge as social practice is always evolving.

The participation is based on negotiations and renegotiations of meanings placed in the world, what implies that the comprehension and the experience are in constant interaction - of fact, they are mutually constitutive-. Actions, persons and world are involved in everything to think, to speak, to know and to learn (Lave & Wenger, 1991, p. 52).

We can identify that the knowledge takes a place in the measure in which the persons, as social beings (Lave, 1996), pass along different immersed experiences in the practices that provide them with meaning in every situation; being that, in consequence, the knowledge is given by participation on the practices.

For the practice, on having been developed inside of a system of relations, says that the meaning depends on one or more contexts as the case of the educational practices. The previous implies that the practice in sense of Wenger

(1998, p. 47) is understood as “to do something in a historical and social context that gives a structure and a meaning to that we do”. That said, the participants of the practice gave it a particular sense concerning the structure, and it is by means of this sense and negotiation of the meanings that the experience gives it a particular meaning when one interacts with other participants. Therefore, the comprehension on the learning in every practice demonstrates significance of the experiences of those who compose it, as well as of the ways of participation into the communities of their members.

Nevertheless, there must be present that one can be inside a practice, but not necessarily part of it. That is, the dynamics to the interior of the communities of practice, allow that the processes of participation advance opposite to the identification, or not identification, of their participants in the above mention practice. To be a part of a Community of practice implies promising with the community and lining up to the ideas that the practice requires or offers.

The levels of identification proposed by Wenger (1998) and Wenger-Trayner and Wenger-Trayner (2015) are delimited by the engagement, the imagination and the alignment, which are mutually necessary to guarantee the participants identification of a community of practice. Hereby, the affiliation with a community implies the will to take part in a group with multiple experiences that have been consolidated by what happens over time. The affiliation also recounts to the union of the learning processes given by the imagination, alignment and commitment, constituting the competitions negotiated inside a community. Alignment is the central element in the organization of a community, since it allows coordinating the participants from internal rules that look for attending to the common aim of the community of practice, as well as of projecting its practices over time. In turn, the imagination begins from the individual interests, which are projected on the global of the community of practice.

A possible interpretation of the processes of identification living into the practices of the future teachers in the prospective teacher course is raised in the *Table 1*.

Table 1. *Identification Processes in the Prospective Teacher Course*

Identification Processes in SLT	(Re)interpretation of the SLT on the prospective teacher Course
Imagination	<ul style="list-style-type: none"> • Participation, confusion and conflict about the aims in the prospective teacher course, as well as their projection in the class planning to the school practices • Communities of practice Interdisciplinary (CoP I), where they identify problematic and common practices and, later, negotiate the different meanings into the practices (school, students, scientific knowledge, educational community and interdisciplinary). • Imagine of the prospective mathematics teachers in the school (or in the university). • Interpretation of the participation like teacher in the near future (as future mathematics teacher). • Image of the future mathematics teacher world to adapt to the scene of which it takes part.

Alignment	<ul style="list-style-type: none"> i) Share of own CoP's resources, such as words, representations, languages and routines that are characteristic of the Course, of the interdisciplinary community or of the school. ii) Use of the virtual environment (TelEduc) their register the reflections on practices of teaching and learning in the school. iii) Ways to make, to act (to say) or to interpret and to re-mean the situations about the educational profession. iv) Development of practices in the school coherent with the educational proposed system. v) Ways to adapt to the rules and the implicit and explicit laws of the different scenes of which it takes part.
Engagement	<ul style="list-style-type: none"> vi) Ways to work, to debate, to think, to use and to produce own knowledge area appliances (like that mathematical knowledges). vii) Competences within the three communities of practice (CdP I, CdP C and CdP S). viii) Ways of exceeding the borders of the knowledge area. ix) Dedication and commitment in the construction and development of joint projects. x) Negotiation of meanings (school, students, disciplinary knowledge, educational community and interdisciplinary knowledge) from their own experiences and the common interests.

Source: Adapt from the Acevedo & Fiorentini (2016)

Previously we could recognize some forms of participation of the future teachers and their possibilities of identification with the Communities of Practice (CoP) constituted about the prospective teacher course, by means of the three processes of *identification*. In the following paragraph, the methodological setting will be described to articulate the Social Theory of Learning with the information produced during the development of the doctoral research.

Research Context

This research was developed with the aim to understand the practices of educational learning and professional development of the students to be Mathematics teachers, who take part of interdisciplinary experiences. With eighteen (18) students from different education institutes and areas, like Biology, Chemistry, Physics, Mathematics, Socials sciences, Sports, arts and Languages, who participate in a prospective teacher Course in the Education Institute of the University of Campinas (Unicamp-Brazil).

In the Unicamp, the curriculum of educational programs contemplate four professional educational practices, which are distributed among the institutes of the masters, for example, the Institute of mathematics has four prospective teacher Courses, that is, there are two mathematics prospective teachers in the Mathematics Institute, and two prospective teacher courses are developed in the education institute. Hereby, the future teachers identify different conceptions of educational practice. For example, in the institute of mathematics, the advantage formation is the mathematics knowledge, for the practices observed and developed privileging the mathematics teachers' actions, and his/her methodologies used to teach the mathematic contents. On the other side, the education faculty proposes

the interdisciplinary prospective teacher course. From the 2008, the prospective teacher course promotes the dialog among the different disciplines, as Zan et. al. (2015, p.120) proposed:

The intention in this organization is to make feasible the meeting and the dialog between the students of the different master's institutes and the construction of a practice collective and integrated to the field of practices. The groups are therefore, constituted by students of different areas and take as a challenge the formulation and the execution of a project to interdisciplinary for the field in which they are acting. There is also understood that this project will have to be articulated to the field interests of professional educational practices.

In consequence, the prospective teacher practice of the Education faculty of the Unicamp, proposes a dialog between different fields of knowledge without leaving aside the identity of the professional educational practice of every field of knowledge. From this, the task stems to think the prospective teacher practices so that the particularity of the practices respect the field. Which stays at the expense of the forming ones of the Course, since the autonomy was developed in the course half-yearly (per prospective teacher course). In general, the Course was trying to motivate the problematization of the teacher practices and learning, always bearing in mind the interactions with other teachers (in the school), and supervisors of practices. In addition, the future teachers were orientated to register the observations and reflections obtained during their participation in the field school of practices. The situations observed in the lounge of classes, or in the school individual analyses made possible and/or from the group that, together with own readings of the Course, contributed to perform the situations. In spite of accompanying other schools, the students problematized situations that were common to other companions.

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From the observations and reflections on the practices of teaching and learning in the school, the course teacher proposed that the future teachers designed a classroom intervention at school based on interdisciplinary work, for the means of this offer, then the prospective teacher identified a common problematic, exceeding the perspective of course in most of the groups. The observations of future teachers in the schools were problematized later in the lounge of classes of the Education Program of Unicamp. In addition to sharing experiences in schools, the prospective teachers identified themselves with situations similar to those exhibited by other students, which motivated the

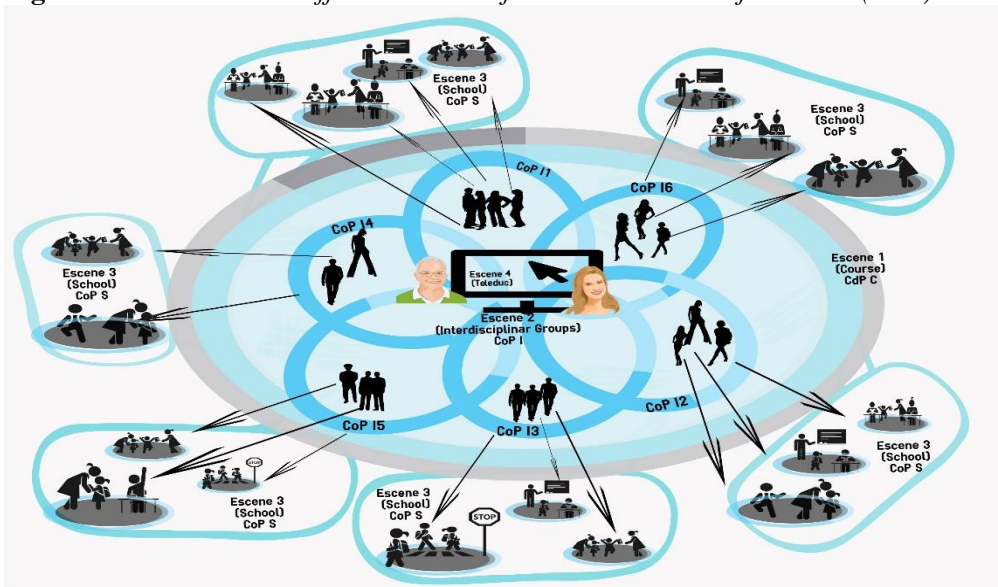
participation of other future teachers, and this was considered as the opportunity for learning to emerge through Contributions from other colleagues.

The dialogue with the bibliographical references and the interpretation of similar situations allowed finding sense to the practices in the school and in the lounge of classes inside the Unicamp. Besides sharing the experiences lived in the schools, the prospective teachers identified similar situations exposed by other prospective teachers, for what it motivated the participation of other prospective teachers, being considered this as the opportunity in order that learnings should emerge by means of contributions of other companions. Later, the prospective teachers were invited to meet in groups (four prospective teachers per group), there should at least be students of two different masters in the group.

In Bakhtin's sense (2003, p. 86), other voices were identified in their words. The voices of others allowed the problematization of teaching and learning practices in the school, besides mobilizing dialogues in the constitution of the groups and identifying common needs. In agreement with the professional development by the prospective teachers, there were identified different scenes of participation in the practices. Initially, a global scene in which 18 students of the prospective teacher course inside the Unicamp corresponded to the landscape of the Course. In correspondence, this scene derives the community of practice of the Course, which is called such as CoP C.

The second scene of participation is the delimited one for the subgroups shaped by students of different masters and that had for intention realize an intervention interdisciplinary in the school practices. Inside this scene, the Communities of practice were constituted such as Interdisciplinary (CoP I). In general, there were constituted six CdP I, whose interests of study were varied. Then, all the relations about the course and their scenes are represented in the Figure 1. This one shows the different relations established among the different communities of practice.

Figure 1. Relations into different Scenes of the Communities of Practice (CoP)

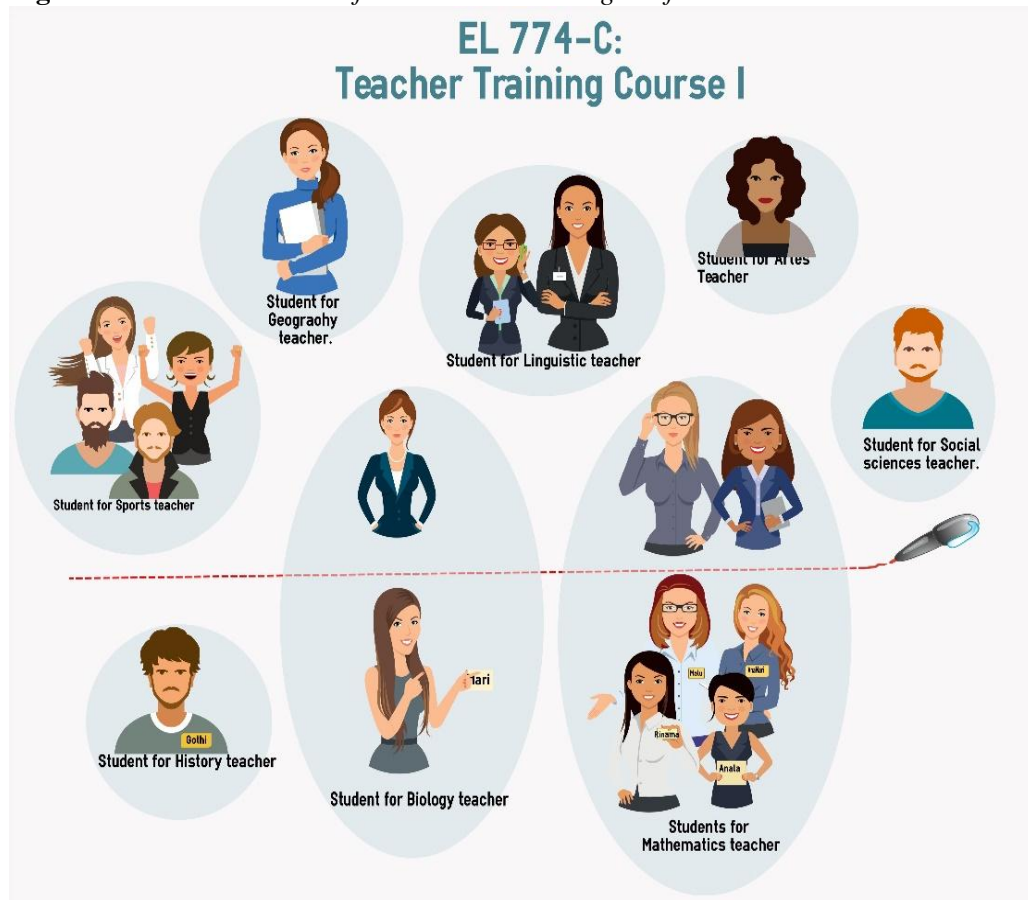


Source: Construction of the author

By the other side, we have the CoP C, represented by the 18 students for teacher in the prospective teacher course in the figure 2. It can specially be observed that the third group includes two students of the Master in Mathematics. The third landscape corresponded to the school, where there was constituted the Community of Practice of the School (CoP S). And, finally, the virtual environment landscape of the platform where they wrote the narrative record of their observations. This is the virtual environment (TelEduc), and its aim is to endorse the work of the students, being constituted in a support for the development of activities of the Course, besides sharing experiences with other students inside the same platform. Nevertheless, from the later scene, a community of practice does not stem, since during the development of the Course it was used as space for recording of observations, or field diaries.

Having present that the group was heterogeneous in its constitution, and that they were attending to diverse interests, it was proposed to investigate on a group of six students of masters, privileging the major quantity in the area of mathematics. Hereby, there were selected two communities of practice, in which there were concentrated four of the six students of master in mathematics registered in the course.

Figure 2. Selected Students of the Course Teaching Professional Practice



Source: Construction of the author

The Interdisciplinary Community of Practice 1 (CoP I1) was interested in knowing the different cultural/symbolic representations that the School possesses in the vision of the pupils. This community was constituted by three students of Master in Mathematics, and one of Master in History. The second interdisciplinary Community of Practice to that was analyzed in the investigation corresponds to the number 4 (CoP I4), which central interest was the Educational Project of Social Integration (PEIS in Portuguese) as environment of introduction to the teaching. This Community was constituted by a student of Master in Mathematics and one of master in Biology.

Methodology

The instruments of production of data used in this investigation targeted to recognize, in a transversal way inside the scenes, what experiences of learning the future teachers of mathematics have when they take part of three communities of practice (CoP C, CoP I, CoP S). Later, and together with a longitudinal analysis of such experiences, it was looked for understanding which punctual moments were those that allowed to be identified or des-identified professionally as future teachers of mathematics.

The analysis of the information produced in field, they have as intention to construct comprehensions on the educational learnings and the professional identity, for which, the narrative represents a way of organizing, interpreting and understanding the experience, as well as “to reconstruct the multiple identities as human beings” (Cochran-Smith & Lytle, 2009, p.113). In addition, on having narrated the histories developed in the different experiences happened in four scenes, a “reflexive process exists between to live, to tell, to re-live and to recount of a history” (Clandinin, 2013, p. 109).

Findings/Results

Some of the obtained results reveal that the voices of others appeared with stand out in the reification of the future teachers. This implies that the polyphony of the dialog, as Bakhtin says (2003, p. 299), represents appropriation of foreign speeches, as well as different positions of identification or des-identification with the teacher profession. The previous thing represents degrees of *otherness* in the own speech of the future teachers. *Otherness* in speeches and manners of understanding the experiences, as well as of identification with the profession, which in turn changes glimpse in the horizons of those who take part in the pedagogic practices.

Two narrative analyses realized on the educational learnings and the professional development of the future teacher of mathematics, from the experiences of the students of Master in Mathematics Malu and Rinama (fictitious names). This experiences took part of the same community of Practice Interdisciplinary (CoP I), show the problematization and re-significance of the School, from the pupils of basic and secondary education of the school think

about the practices on the School.

The Rinama's Case

After reaching her Mathematics Education Program in 2015, Rinama began the course of Pedagogy Education Program in the second semester in 2015, in the same University. Later to the experience in the institute of Mathematics, she says to have a “different look” on the education. Rinama's interest came from multiple questions on the learning of the students who were coming to the secondary education and “she was not pleasing the mathematics”. Nevertheless, her interest was going beyond, so Rinama always wanted to know if the students were not pleasing the mathematics after their knowing, or simply because they came to that level and they never understood about that it was treating itself, for what her question on the learning relapsed into the basic education of the mathematics.

Her constant reflections on this individual, took her to about the beginning of the new career that she was undertaking and this way to know if really “her meeting with the mathematics was because they did not have 'good' teachers in the basic education”. Rinama demonstrates to have evolved in her way of problematizing the ways of taking part in room of classroom. First, position regarding the relationship teacher-pupil to the interior of the lounge of classes. That is, if one believes in a bridge between them to give the freedom of “taking part and to communicate” to solve worries and to facilitate the way towards the learning, or simply “an abyss opens” between them and distance the relation of communication. In consequence, the pupils might come closer more the learning, the interior of the lounge of classes, if the relation between teacher and student was near.

Hereby, Rinama, refers basically to her experiences as a pupil, likewise, she is positioned as teacher, and she does not identify with this type of educational practices, where the abyss is imminent. In turn, it is possible to identify in this type of affirmations, key aspects of identification, as student, to the point of “imagine and promise”, in the sense Wenger-Trayner and Wenger-Trayner (2015, p. 22), as a teacher inside a system of actions, relations and meanings in the lounge of classes, but it does not line up with the distant practices between teacher and student.

In addition, this demonstrates the constant traffic between the borders of the communities of practice of which she took part as pupil of the school and of the University as instructor in the schools of educational practices. Likewise, Rinama recognizes favorable practices developed by the teachers with whom a different link is established and that, at least, allow to solve doubts in a classroom, or believe in a space in which, after the class, of some form, the students manage to understand about what one speaks in mathematics. Nowadays, as a teacher, she problematizes the fact that the students are silent in a class, since it is not known if the student understands everything or if they take part and ask because they “feel sorry”. Rinama demonstrates to be in doubt about having done the role of the teacher “adequately”, so she is always questioning herself front to this type of behavior, since she was precisely like that at some moment, and managed to be

placed rapidly.

Her affirmations allow to recognize her learnings by means of her participation in the different communities. These learnings can have constituted a landscape of learning of the practices, delineating the path of academic participation. The previous thing also provokes in Rinama a form of identification as Wenger affirms (1998, p.143), with own practices of the educational profession, these being characterized by the interactions of the teacher and the students in the lounge of classes, and out of this one, this way it allows to be placed in the place of other one, during the constant traffic in the teacher (of practices) and the student (who was in the Mathematics Education Program). Other experiences compose the landscape of Rinama's practices. For example, the contact with the school was not foreign to her experience, since she had already realized three educational practices, two in the public school and one in the private school.

The public school offered her different experiences from participation, from a "simple observation" to direct experiences with the students, in which she helped them, corrected examinations, answered questions, and even took part as an extracurricular teacher in the secondary education. In general, Rinama thinks that they were experiences that helped to "enrich" her formation.

In addition, she could admit that different forms of participation exist and her relationship with the practice of being a teacher. For example, other activities of formation in the master, such as book reviews and didactic materials, mathematical school education and extracurricular courses in the area of pedagogy and mathematics, which helped her to "to analyze and elaborate different activities for the education. As well as to discuss some topics of education and to perceive other different activities for the education" which were highlighted in the answers of the questionnaire, favorable to the educational practice, by means of these experiences she could "see the work of other teachers and analyze what she would do in certain situations". It is important to admit that they are valued as learners when placed in other experiences, knowledge or practices, those she would not have achieved from the mathematics favored in her formation in the master. Maybe Rinama, identified from the beginning with another type of practices, such as the exploratory-investigative activities, as Fiorentini (2012, p. 70) describes, in which the aim goes beyond the answers to an exercise.

Malu's Case

In the educational practices, Malu attends secondary education. In one of the student diaries, she reports what happened in a class of Trigonometry that she was accompanying. Her statement narrates different situations of students' behavior, as well as of their learnings. After applying a test, the teacher goes out of the class and delays to return and to retake the topic of the relations in the unit circle. On having finished the explanation of the exercises, she gives others that wrap symmetries, so the pupils resolve, for example, in view of the value of the bosom of 30, they had to find the bosom of 150, 210, and 330 degrees. During the explanation of the teacher on the board, the students were "heedless", and "they spoke so loudly" that the teacher interrupts the explanation to raise the tone of

voice. She asks for silence, but this is not sufficient, later she justifies her well-known falls as consequence of their distraction in class. The silence returns to the lounge of classes and some students try to take part. Some of them solve the exercise alone. On having spent some time on the exercise, the students protest on the difficulty to solve another one of the same type. The teacher sits down at the table, and there she comments that doing the exercises is like to go to the gymnasium. That is, to have results, they have to exercise in the gymnasium every day. Meanwhile, a pupil shouts from her position that “in the gymnasium the result is evident”, and later she adds “why am I going to use this, if I am going to be a recycler?”, additional question: “Am I going to do these accounts to take out garbage”? For what the teacher has another response, opposite to her future as a professional, arguing she would want to take part in contests for a working place, in which she would have to present examinations of basic competitions. Nevertheless, the student insisted on not being employed at the exercise. This situation was widely described in Malu's diary, catching enough attention from the medical instructor.

On having written this diary, Malu reports different tensions especially in the education of the topic, for example, later she questioned the way of teaching that content, the need to support the attention of the students, as well as the need to justify the applicability of that content on the question asked by the student. The first tension refers to the form of education of the content, which describes an “instrumental” practice of the paradigm of the exercise (Skovsmose, 2000, p.66).

Malu talks about the traditional methodology of education of the mathematics, limiting itself to the explanation, and forthwith exercises of the same type, or similar, for them to resolve without the help of the teacher. In this respect, Malu identifies the practices in which the student has to “fit in the school, and not the school in the pupil”, which was confirmed in the group interview of the year 2014. In the same way, Malu argues that in that lounge are favored the practices of boarding “algorithmic or syntactic more than the semantics (of production and negotiation of meanings) of the procedures and ideas of the school mathematics” (Fiorentini & Miorim, 2010, p. 32). On the contrary, Malu identifies with the practices that carry the use of concrete materials to explain, in the search of the comprehension.

In the same experience, Malu highlights the second tension on the need that the teacher has, to support the attention of the students of that course, from the moment of the examination, up to the end of the class. That is, for every situation experienced by the teacher, one reason to convince to the group on that type of activity. For example, on being silent, the explanation will be better included, and in consequence, her notes will improve for the next quarter. Or, maybe, if the students understands the related thing to the unit, at the time circle, a good result will be obtained if he/she takes part in a contest for a working place. Hereby, Malu highlights the form that the pupils ask for the teacher justification to be felt to the symmetries to the interior of the unit circle, be inside the same mathematical context, or, in the near future, in a professional occupation. In spite of the extrinsic sense given by the teacher, this justification for the student to attribute value or significance to the topic of study.

In contrast with the first narrated history, Malu presents what happened in another lounge of classes. The students' quantity, it was superior to that of the previous room, and, in spite of this a routine was kept in the actions of the day: called of assistance, later the topic was explained, a series of exercises solved on the board, and transcription of these to the notebook so that the students answered the same actions, now in their notebooks. Especially, the teacher began this class by correcting an exercise given as a task in a previous class. Not all of them had solved the task, but to the moment of the correction, certain order was kept in the lounge. Nevertheless, the teacher perceives that some of them had not come to the previous class, as what they did not have the exercise in the notebook. So, the teacher calls their attention by saying that "they could at least support by opening the notebook and following the lesson". These facts call Malu's attention very much, since a "contrast" is evident in the actions of the students, even the major number of students was paying attention and "available", it is obvious the need for work in the lounge, without raising questions on the exercises. Hereby, Malu affirms that, while in a lounge of classes, the group "questions the applicability of mathematics", another group knows that it needs "to register in the notebook what is written in the board". Short after, in the interview of the CoP II, Malu emphasizes the differences between the pupils, the groups, and the needs (obligations) of the teacher to recognize the types of students that he/she has in every course.

About the difference between both prospective teacher, Malu thinks indirectly about the contrast between the groups, and her position on those situations, because in a school of this type is near to the mathematics teacher experience. Hereby, Malu is positioned coming in memory of future (Bakhtin, 2003, p.41), which takes "functional characteristics of observed models" (Pimenta & Lima, 2006, p. 8). This way, the re-significance of the school receives sense in her experience in which she analyzes different situations that confirm with her realities and imaginary on the educational profession. Also, it is possible to be thought that Malu has learnings (Lave & Wenger, 1991, p.32) on the school, her system, and her functioning on having been placed in experiences that wrap meanings and knowledge of the practices of teaching and learning. Meanwhile, one can emphasize the wealth of the experiences through what Malu lives, since they allow her to construct a professional identity, on the bases of the "social significance of the profession; in the constant review of the social meanings of the profession; in the review of traditions. As well as in the reaffirmation of practices culturally dedicated and that remain significant" (Pimenta, 1999, p. 42). That is, the significance of the experiences in the practices, allows her to find essential elements to achieve the commitment, the alignment and the imagination (Wenger-Trayner & Wenger-Trayner, 2015, p.21) inside the profession. Nevertheless, these elements do not guarantee a total identification with the profession, on the contrary, they allow to recognize elements in which agreements exist and can be important, under some conditions that get accommodated to her needs, or others that definitely do not manage to be meant in Malu. The latter, it is the case, for example, of those practices in which the diversity is not recognized, as those of the narrated classrooms.

Finally, it is highlighted the importance of the school for Malu, during her answers in the individual interviews and group activities. In the matter, one says that the role of the school is “to make the pupil thinks for himself [...] that the pupil becomes aware of what she thinks, and that she can think differently”. Likewise, Malu complements this response alluding to her memory of future, in the sense Bakhtinian, about the classroom on having referred to a type of “teacher who thinks about these things [...] is not only to study here (at Unicamp) and to end up by entering the system as it works, but also to take what we think”. The importance of the responses given by Malu implies the need of rethink the teaching profession. That is, in each of the answers given by Malu, it shows her critical vision on the current system of education and her des-identification with the system. In the expression “to enter the system as she works”, and in the dialogs on the current system of education, in which she mentions not to respond to the system for the needs of the students or projects, inside that system, with the conditions that it offers.

Discussion and Conclusions

The formative practice of the prospective teacher course will be able to break the traditional isolation or distance between the school Courses and the Education Program. An initial approximation allows us to recognize that, from the relations established by the interdisciplinarity there are actions, relations and significances that mobilize the analysis and the problematization of the learnings that will be produced in the practice, during the activities of the professional education practice. In this context, it is considered to be the professional educational practice of the Education faculty of the University of Campinas (Unicamp) the place where formative experiences can happen, differently from those that the border places among the disciplines of the prospective teachers and, also, between the University and the educational institutions, which can turn into places of captivation or disenchantment and that will be able to relapse into the identification or des-identification of the future teacher of mathematics as a professional of education. This one, because the future teacher joins a practice that was initially idealized or theorized, that can confirm or make them give up their initial idea of being a teacher, before being formed as a master, or enclosed after concluding their master, as in Malu’s case. The opposite happened to Rinama, who identified herself in the profession from early age, and remains in the constant search for new and better practices of education of mathematics. It is exactly this 'border' moment that allows her to decide in advance the results of the practice, which she tries to achieve in her near future. The course of professional educational practice, therefore, allows to think about the professional learnings that constitute a future teacher of mathematics and think about education as the response to the current needs of the general system, and of the particularities of those who integrate it.

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