Brazilian Thesis: A Look for Training of the Early Years Teachers in Multiplicative Field

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Abstract

This article is an excerpt from the preliminary analysis of doctoral thesis in mathematics education. Our objective was a synthesis of Brazilian research dealing with the training of teachers in the early years regarding Multiplicative field the period 1996-2013 . For its realization a search was made on site National Library of Theses and Dissertations, by the keywords taken from our research goal . Selected twenty-nine research, in which we analyze their similarities and differences. The theoretical framework used by research on the formative aspects were based on the Professional Teaching Knowledge and action aspects of reflection. As to the theoretical mathematical object were identified that affect the development of the Multiplicative field. In our analyzes we perceive aspects: reflection on practice , the need to deepen the mathematical object and contributions by teachers for further training .

Keywords: Teacher education. Multiplicative field .early years

1. Introduction

This article is partly the result of a doctoral thesis in Mathematics Education , which aims to achieve a synthesis of dissertations and theses that deal with the Brazilian service training of teachers in the early years Multiplicative field referring to the period 1996-2013 .

In this work we assume continuous training in Perrenoud (1966) and Garcia (1995) addressed . Perrenoud (1966) emphasizes that training still consists of long-term goals , it is necessary both to develop skills that reality and practice are articulated. So the skills to be developed should be

- Organize and animate learning situations;
- Manage the progression of learning;
- Develop and evolve differentiating devices;
- Engage students in their learning and their work
- Working in teams;
- Participate in school management;
- Inform and involve parents;
- Serve up of new technologies;
- Addressing the duties and the ethical dilemmas of the profession; and
- Manage your own training. Thus we observe that the training continues widen our field of research.

Garcia (1995) emphasizes that teaching practice is formed throughout the career, covering experiences , practical and theoretical knowledge , enabling the professional autonomy to plan its activities and is an autodidact building their knowledge on a continuous process . The author continues the formation is characterized as a set of actions that can be undertaken in groups or individually providing professional development.

Justify the choice of thematic training of teachers and segment the initial years for having the need for more studies in this area of education , especially regarding the multiplicative field. This fact is highlighted by studies such as those of Fiorentini Nacarato ; Ferreira ; Lopes ; Freitas and Miskulin (2002) , Mello (2011) and Alencar (2012).

The choice of mathematical object - the multiplicative field is given by the hypothesis that although a field that has these relevant searches are still forming, especially when it comes on the training of teachers. Moreover, we admit its importance to mathematics.

2. Research: its Procedures

In this article we present a state of knowledge which Romanovski and Ens (2006) differentiates the state of the art [...] state of the art given this name when they cover a whole area of knowledge in the different aspects that generated productions [...] The study covers only one sector of publications on the topic in question has been called state of knowledge . (ROMANOVSKI and ENS , 2006 p.39- 40)

For data search performed a site search National Library of dissertations and theses through key words taken from our goal : Multiplicative Field and the like terms (multiplication, division , combinatorics and proportionality) , Teacher Education and early years . As filter " relevance" has been used to perform the search.

When conducting our search we found that the Multiplicative field , is more comprehensive than studies with Multiplicative Conceptual Field . We note that the term with Multiplicative Conceptual Field not find dissertations and theses in our research .

With the use of the terms obtained 110 surveys as showing in Table 1.

As we read the titles and abstracts selected the works that referred the key words contained in our goal and establish similarities and differences . In this selection we obtained twenty-nine research presented in table 2 .

3. Theoretical Support Teacher Training

By analyzing the theses checked the authors used more on the aspects of training:

Shulman	9 searches
Schon	6 searches
Zeickner	6 searches

We conducted a qualitative and quantitative table with the aim of verifying the theoretical reference cited by the authors and in most present here its main ideas .

Shulman (1986) reported on the Professional Teaching Knowledge and tells us about their main areas as: the specific content knowledge, pedagogical content knowledge, and curricular knowledge. The first is the knowledge which the teacher must have mastery teaching . The second knowledge are the means and strategies that the teacher uses to student learning and the third are the specs and details of the proposed curriculum. Shulman points out that the categories to become Professional Teaching Knowledge need to articulate with each other .

Schön (1987) bring in aspects of reflection on teaching practice and its aspects as: knowledge into action , which is the knowledge of the execution of their duties ; reflection in action , which are verbal perceptions of these professionals in action and reflection on action is the modification of thought and analysis of its educational activities .

Zeichner (1993) reports on the need of teachers to conduct mediations in their practices in the educational processes because these acts is to make the knowledge develops . In addition , the author cites the importance of critical performance before the teachers actions , according to the author this fact will bring a perspective of quality.

4. The Theoretical Foundation of the Multiplicative Field

Similarly we checked what were the most cited authors in teacher education, we did with the theoretical framework involving the multiplicative field and identified.

Vergnaud	25 searches
Nunes	22 searches

Vergnaud (1990) extends this study to the Conceptual Fields Theory , explaining us that this is cognitive because it " presents some principles based on the development of complex learning and competence " (VERGNAUD , 1990 , p.133) and psychological , for that it is the " study of similarities and differences between knowledge of the conceptual point of view ." (VERGNAUD , 1990 , p . 133) . The author indicates that the theory proposes to study the development of the content. To do so, reports that a conceptual field is built through experiences of everyday life and school.

Nunes (1997) multiplicative reasoning is the existence of two variables of different magnitudes . The author emphasizes that the multiplicative reasoning involves situations correspond one to many relationships between variables and situations involving division and distribution divisions in half.

5. Reviews

In analyzing this research we observe some similarities involving continuing education , shown in frame 1 .

In this sense we realize that Garcia Silva (2007) , Vasconcelos (2008) , Starepravo (2010) , Santos (2012) , Merlini (2012) tend to explain aspects of the reflection on practice and how this action promotes contributions to the ongoing training of teachers in the early years. " . Required is a constant reflection on practice , especially in environments conducive to collaborative work " verified this fact in probes Garcia Silva (2007.p.10) who reports that Like Vasconcelos (2008) adds that :

" A qualitative analysis of discussions and reflections recorded in videos on the teaching and learning of teachers made the practices were reflected in targeted methodological procedures for various instructional possibilities , by teachers and consequently students' learning . " (Vasconcelos , 2008 , p.9)

Such aspects mentioned lead us to believe that reflection on practice is one of the factors that can contribute significantly in -service training . Schön (1987) in their studies have told us that the reflection of teaching practice including its various aspects has the potential to transform the thinking and development of its educational activities .

We found that the research that identified the need to deepen the study of mathematical object . Such evidence identified in probes Canoes (1997) showed that two perspectives:

1) the teachers have a narrow view of the multiplicative conceptual field , especially as regards the exploitation of present situations in this field ; and 2) teachers tend to use concepts and procedures within a domain of validity that are not true in other areas , without having a clear understanding of what is possible and what cannot be connected in these areas (Canoes , 1997 p.8)

Just as in Canova (2006) that expands our thinking putting that "there is a need to broaden the conceptual field of these teachers with the subject matter fraction (mathematical object) " (p.8) . Shulman (1986) in their study indicates the importance of domain -specific content knowledge for planning actions of the teacher.

Studies Losito (1996); Canoes (1997); Araújo (2003) ; Moutinho (2005); Goulart (2005); Santos (2005); Smith (2006a); Silva (2006b), Fields (2007); Smith (2007) ; Garcia Silva , (2007) , Nunrberg (2008) ; Mello (2008) ; Vasconcelos (2008) ; Neves (2008) ; Starepravo (2010); Nicolodi (2009) ; Person (2009), Rock (2011) ; Santos (2012) ; Ferreira (2012); Alencar (2012); Fiore (2013) and Silva (2013) show contributions to continuing education . Among the contributions are : the analysis of the resolutions of the students and their difficulties , the study of different strategies , mediation and educational interventions and the use of narratives as a resource for teacher and student . Zeichner (1993) states that teachers need to experience different school situations so they can play the role of mediators and producers of knowledge.

Also identified some categories of mathematical object , in which Losito (1996) ; Canoes (1997); Moutinho (2005); Santos (2005); Silva (2006); Canova (2006); Fields (2007); Smith (2007) ; Garcia Silva (2007); Neves (2008) ; Vasconcelos (2008) ; Mello (2008) ; Nicolodi , (2009) ; Alencar (2012) ; Merlini (2012); Ferreira (2012) and Santos (2012) study have directed the division .

Since Ewbank (2002), Allen (2003); Goulart (2005); Silva (2006); Skipper (2006); Nunberg (2008) , Camejo (2009) ; Person (2009) ; Starepravo (2010) , Rock (2011) ; Fiore (2012), Santos (2012) ; Alencar (2012) and Silva (2013) presented a study on multiplication. We point out that some studies direcionavam to both mathematical objects .

6. Considerations the Research

We observed that the twenty and nine studies have some its focus on teaching Multiplicative field, however we realize clues that may contribute to the training of teachers is still in the early years. We performed such an inference because we know that the features observed in the teaching of mathematics are intrinsically linked to the formation of professional knowledge.

We noted other indications for continuing vocational training which can be significant as: reflection on practice, deepening the study of the mathematical object and contributions to teacher education.

We believe that this article can contribute with other studies that further training of teachers in the early years in the Multiplicative Field be directed.

7. Tables and Frame

Table 1 - Search Theses and Dissertations by Subject

Multiplicative field , Teacher Training and initial Years	1
Multiplicative field , teacher education and early grades	0
Teacher training and early grades	3
Multiplicative field	17
Multiplication , Teacher training and early years	2
Multiplication initial teacher training series	0
Multiplication and Teacher Training	14
Division , Teacher Education and early years	2
Division Teacher Training and initial series,	0
Division and Teacher Training	64
Combinatorial Training of teachers and early years	0
Combinatorial Teacher Training and initial series	0
Combinatorics and Teacher Training	4
Proportionality Teacher training and early years	0
Proportionality and Initial Teacher Training Series	0
Proportionality and Teacher Education	3

Table 2 - Dissertations and Theses Related to the Continuous Training of Teachers in the Early Years on the Multiplicative Field

The decimal number system and the multiplicative principle : a study in 4ª degree 1ª degree Sonia Maria Losito UNICAMP -FE Masters 1996
The Multiplicative conceptual field in perspective Professor of the initial degree (1st to 4th grade) Silvia Swain Canoes PUCSP Masters 1997
Teaching Multiplication for children and adults : concepts , principles and methodology. Mara Silvia Andrew Ewbank UNICAMP -FE Doctorate 2002
Passage from 4th to 5th grade : what teachers think of these series on the essential content of mathematics. Angelita Minetto Araújo UFPR Masters 2003
Mathematics in a school organized by cycles of human formation Sheila Maris Gomes Goulart UFMG Masters 2005
Fraction and its different meanings : a study with students from 4º to 8º degree of elementary school . Leonel Valpereiro Moutinho PUCSP Masters 2005
The concept of fraction in its various meanings : A diagnostic study with teachers working in elementary education Appeared dos Santos PUCSP Masters 2005
Decimal numbers : in the knowledge of adults differ from children Valdenice Leitão da Silva UFPE Masters 2006

Arithmetic expressions : beliefs , concepts and skills in understanding the versatile teacher Ubiratan Barros Arrais PUCSP Masters 2006
Belief , design and competence of teachers 1 and 2 cycle of basic education regarding the fraction . Raquel Factori Canova PUCSP Masters 2006
Teaching and learning Cartesian problems : inter - relationships between different representations Vera Lucia da Silva PUCSP Masters 2006
Difficulties in learning division : analysis of production errors of elementary school students and its relationship with teaching practiced by teachers Edileni Juventino Garcia Campos Don Bosco Catholic University Masters 2007
The developmental teaching and learning of mathematics in the 1st phase of elementary school. Fernanda Soares Cavalcante Chaves Catholic University of Goias Masters 2007
The challenge of teacher professional development : analysis of the continuing education of a group of teachers in early elementary school , with the object of discussion the teaching and learning of fractions . Angelica Garcia Silva Fontoura PUCSP Doctorate 2007
The reconstruction of the concept of split in teacher training : the use of the game as a methodological resource Cheila Francett Silva Bezerra de Vasconcelos UFAL Masters 2008
Multiplication tables : meanings and meanings produced by the teachers of the lower grades of elementary school Joyce Nürnberg UNESC Masters 2008
Argumentation and metacognition in solving arithmetic problems of division Telma Assad Mello UNICAMP FE Masters 2008
The division and the rational numbers : a survey of pedagogical intervention on the development of conceptual skills of students and teachers Regina da Silva Neves Pina UNB PhD 2008
The knowledge of students from first grade of elementary school on the division Josiane Elias Nicolodi UNIVALI Masters 2009
The constitution of knowledge of teaching : an analysis of the multiplicative field Adriana Camejo da Silva PUCSP Doctorate 2009
Who dances with whom : the development of combinatorial reasoning of two years from elementary to three years of high school . Cristiane Azevedo dos Santos Person UFPE Doctorate 2009
The multiplication in elementary school I analyze a teaching proposal Ana Ruth Starepravo USP FE 2010 Doctorate
Teacher training and education for combinatorial problems : different looks , different knowledge . Cristiane Arimatea UFPE Rock Master 2011
Teacher Professional Knowledge of teachers in the 5th year in a school with good performance in Mathematics : . Event of multiplicative structures Edvonete Souza de Alencar UNIBAN Masters 2012
Brands division : a case study on learning of division operation in the 4th grade of elementary school Michele dos Santos Ferreira UFRGS Masters 2012
The potential of a training process for reflection on practice and on a series of initial teacher : a case study . Vera Lucia Merlini PUCSP Doctorate 2012
Processes of collaborative training with focus on Campo Multiplicative : a possible way with polyvalent teachers Appeared dos Santos PUCSP Doctorate 2012
The Narrative scientific and logical thinking in solving problems in Additive and Multiplicative conceptual field in the final years of elementary education Caroline Fiore UNIBAN Masters 2013
A refresher course for teachers from the first cycle using new technologies in teaching Mathematics Julian Osorio da Silva UFSCAR Masters 2013

Frame 1 - Categories of Analysis

Reflection on Practice		Garcia Silva (2007), Vasconcelos (2008), Starepravo (2010), Santos (2012), Merlini (2012)
Deepening Mathematical study of the object		Canoas (1997), Ewbank (2002), Araújo (2003), Santos (2005), Arrais(2006), Canova (2006), Campos (2007), Garcia Silva (2007) , Neves (2008), Vasconcelos (2008); Camejo (2009), Merlini (2012) Alencar (2012)
Contributions to continuing education	• The analysis of the resolutions of the students and their difficulties , • The study of different strategies , • Mediation and pedagogical interventions • and the use of narratives as a resource for teacher and student .	Losito (1996); Canoas (1997); Araújo(2003) ; Moutinho (2005); Goulart, (2005); Santos (2005); Silva (2006a); Silva (2006b); Campos (2007); Soares (2007); Garcia Silva, (2007), Nunrberg (2008); Mello (2008); Vasconcelos (2008); Neves (2008); Starepravo (2010); Nicolodi (2009) ; Pessoa (2009) ; Rocha (2011) ; Santos (2012); Ferreira (2012); Alencar (2012) ; Fiore (2013) Silva (2013

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