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ABSTRACTS

SONIA MARIA MONTEIRO DA SILVA BURIGATO, CÉCILE OUVRIER-BUFFET, JOSÉ LUIZ MAGALHÃES DE FREITAS . LE CONCEPT DE LIMITE DE FONCTION
UNE ANALYSE DES SCHÈMES D'ÉTUDIANTS À LA TRANSITION SECONDAIRE-SUPÉRIEUR EN FRANCE ET AU BRÉSIL*.*

Abstract. The levels of education and the ways to teach the limits of function are different in France and in Brazil. However, we make the hypothesis that the schemes developed by students regarding the concept of limit can be compared. In this article, we develop a methodology to analyze the students' schemes involving the concept of limit of function with two aims: to finely analyze the processes of today's students (in France and in Brazil) at the beginning of the learning of this concept and to highlight the evolution of their schemes, taking into account that these two countries are different in terms of the teaching of this concept.

SOPHIE ROUSSE. LE DISCRET ET LE CONTINU DANS L'ENSEIGNEMENT DES SUITES ET DES FONCTIONS EN FIN DE COLLEGE ET AU LYCEE

Abstract. **"The discrete" and "the continuous" in teaching sequences and functions in French secondary school.** Notions pertaining to the Calculus field in France, up to the end of Seconde (10^{th} grade), are mainly functions and their graphical representations. Curricula, followed by textbooks, integrate these notions into "the continuous". This appears to be self-evident since "the discrete" is not explicitly addressed. Sequences, which are a priori part of "the discrete", are first studied in Première.

However, "the discrete" and "the continuous" have mathematical aspects and constitute two worlds (in a sense that we will define) between which it is difficult to delineate a boundary. Students' activities on tasks which mobilize continuous functions may be carried out in the discrete world as much as in the continuous one. Furthermore, sequences and functions in secondary school count numerous interactions and correct or incorrect analogies. Textbooks make choices in the graphical and algebraical registers which differ from one book series to another, which testifies to the existence of objective difficulties. Lastly, in secondary school and MEEF master, students' work shows a number of confusions between sequences and functions. This leads us to reflect on a possible introduction of sequences prior to functions.

PATRICIA MARCHAND, CLAIRE GUILLE-BIEL WINDER, LAURENT THEIS, TERESA ASSUDE. . DIFFICULTES D'UN SYSTEME DIDACTIQUE A PROPOS DE L'ENSEIGNEMENT DU VOLUME AU PRIMAIRE

Abstract. Difficulties of a didactic system on teaching volume at primary school. Our work studies didactic systems including the main didactic system, essentially the classroom, and the auxiliary didactic system which is peripheral to the former. Through a case study, this paper deals with the difficulties of the didactic system encountered when setting up an aid session prior to the resolution of a volume problem. This type of aid session having proved worthy in the context of previous research, has led us to study the difficulties encountered during its implementation. Three difficulties emerged from this study: those related to the teaching project, to the choice of didactic material and to the concept of volume itself. These difficulties had consequences, mainly, on the mesogenetic function of the didactic system, but also, systemically, on the other functions.

SEBASTIEN JOLIVET, ELANN LESNES-CUISINIEZ, BRIGITTE GRUGEON- ALLYS . CONCEPTION D'UNE PLATEFORME D'APPRENTISSAGE EN LIGNE EN ALGEBRE ET EN GEOMETRIE : PRISE EN COMPTE ET APPORTS DE MODELES DIDACTIQUES

Abstract. Design of an e-learning platform in algebra and geometry : consideration and contribution of didactic models. This article presents the design of a theoretical and methodological framework for the didactic design of a learning environment: a learning platform in mathematics for cycle 4 students (aged 12 to 15). We cross several approaches to build didactic models and their computer representation: a model of the knowledge involved in the platform, a model of the learner's reasoning, and a model of learning paths adapted to the student's learning needs. We illustrate this approach on two themes from two mathematical domains, the solving of first-degree equations in algebra and the construction of triangles in geometry.

CELINE CONSTANTIN. LA SUBSTITUTION, POINTS DE VUE ECOLOGIQUE ET SEMIOLINGUISTIQUE

Abstract. Substitution, ecological and semiolinguistic points of view. The work presented here focuses on the semiolinguistic dimension of elementary algebra knowledge and on a particular object of knowledge: substitution. Analyses of textbooks and teaching practices have led us to postulate that this knowledge is part of what Margolinas and Laparra call transparent knowledge for the teacher. From an ecological questioning, we seek to determine the conditions, constraints, but also the potentialities to consider such an object of knowledge for the teaching of elementary algebra. To do this, we rely on a double epistemological and didactic analysis before addressing the results of an experiment conducted in a middle school class.

JOSEP MARÍA FORTUNY, TOMÁS RECIO, PHILIPPE R. RICHARD, EUGENIO ROANES-LOZANO.

ANÁLISIS DEL DISCURSO DE LOS PROFESORES EN FORMACIÓN EN UN CONTEXTO DE INNOVACIÓN PEDAGÓGICA EN GEOMETRÍA

Abstract. Reflective discourse analysis of pre-service teachers in a context of pedagogical innovation in geometry. The reflective narratives of three pre-service teachers are analysed from the perspective of discourse analysis and reflection on practice, applied to the acquisition of geometric competences and the role of dynamic geometry. In the context of the master's degree for future secondary school teachers in mathematics and a pedagogical innovation project, where two of the authors gave training sessions entitled 'automated visualization' and 'technological mediation', the pre-service teachers were given a questionnaire in which they were asked to return to what they had learned, questioning the contribution of their training to their future teaching practice. In the narratives collected, three degrees of reflection can be found, ranging from the naivety of certain assessments to professional initiatives and purely mathematical perspectives. The didactical and mathematical consequences of this analysis are presented and discussed, highlighting, in particular, the intrinsic difficulty of ensuring that relevant, but potentially disruptive, ideas of pedagogical innovation are conveyed to pre-service teachers against the weight of tradition and personal beliefs in mathematics teaching.