

ABSTRACTS

NADINE CHAPDELAINÉ, ERIKA-LYNE SMITH, NATHALIE POIRIER LIENS ET VALEURS PRÉDICTIVES DU RAISONNEMENT FLUIDE ET DES FONCTIONS EXÉCUTIVES SUR LES HABILITÉS EN MATHÉMATIQUES D'ÉLÈVES QUÉBÉCOIS AYANT UN TROUBLE DU SPECTRE DE L'AUTISME

Abstract. Links and predictive values of fluid reasoning and executive functions on the mathematical skills of adolescents with autism spectrum disorder. Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by deficits in social communication and restricted/repetitive patterns of behaviours. Mathematical abilities can be influenced by executive functions and fluent reasoning. This study describes the mathematical skills of 20 Quebec students with ASD and the predictive values of fluent reasoning and executive functions on these skills. Results reveal overall mathematics scores within the low average range. Fluid reasoning and executive functions are significantly correlated with mathematical skills. According to the regression analysis, fluent reasoning skills significantly predict mathematical abilities unlike executive functions. To optimize mathematical success, intervention should target fluent reasoning.

ROZENN TEXIER-PICARD, GHISLAINE GUEUDET, MURIELLE GERIN ÉGALITE FEMMES-HOMMES EN CLASSE PRÉPARATOIRE SCIENTIFIQUE : UNE ÉTUDE EXPLORATOIRE EN DIDACTIQUE DES MATHÉMATIQUES

Abstract. Gender equality in French scientific preparatory classes: an exploratory study in mathematics education. In this paper we study the issue of gender equality in mathematics at tertiary level. While most studies about this topic use a quantitative approach, we choose here a qualitative approach, in order to take into account the mathematical contents at stake, in a didactics perspective. We study gender equality in the context of a specific project-based course ("supervised personal interest work", TIPE in French), in a scientific preparatory class. Our methodology combines observations of sessions and logbooks for a gender-mixed group over a four-month period. The analysis shows asymmetries in the students' topoi and in topogenetic positions.

LALINA COULANGE, GREGORY TRAIN. FRACTION À L'ÉCOLE PRIMAIRE EN FRANCE : UN « OBJET » À (RE)QUESTIONNER ?

Abstract. Fractions in primary school in France : an 'object' to (re)question? We aim to identify in this text what may pose difficulties in teaching and learning fractions at school in the French educational context. Different experiments conducted over several years within an LéA (Associated educational Place) are studied and discussed in relation to institutional requirements, as well as research work in the field of Mathematics Education. We test different tasks in the mathematics class that are not commonly used in the French curriculum and discuss their potential and limitations. This allows us to contribute to a broader perspective on the teaching and learning of fractions in France and elsewhere.

**ERIC MOUNIER, DAVID BEYLOT, ALINE BLANCHOUIN, FRANÇOISE
CHENEVOTOT-QUENTIN, NADINE GRAPIN, LAURENCE LEDAN REPERER LES
DEMARCHES EN RESOLUTION DE PROBLEMES D'UN ELEVE DE GRADE 2 PAR
L'ANALYSE DE SES PROCEDURES : INFLUENCE DE LA TAILLE DES NOMBRES**

Abstract. Identifying the problem-solving approaches of a grade 2 pupil by analyzing his/her procedures: influence of number size. The research reported in this article is to provide a detailed description of the activity of a grade 2 pupil when solving arithmetical problems with verbal statements concerning additive structures. This challenge has the particularity of being addressed using tools drawn primarily from didactics of mathematics. We have revisited the modelling of the activity in solving arithmetical problems with verbal statements proposed by Verschaffel and De Corte (1997, 2008) as well as the definition of approach, which constitute significant contributions at the theoretical level. We have developed an innovative methodology which, when put to the test, has enabled us to identify new results concerning a pupil's activity. They shed new light on the link between the “size” of the numbers present in verbal statements of arithmetical problems concerning additive structures and the approaches taken by a grade 2 pupil.

**JULIÁN SANTOS BÚSQUEDA DEL EQUILIBRIO ENTRE EL COMPONENTE ADIDÁCTICO
Y DIDÁCTICO DEL SABER EN LA INGENIERÍA DIDÁCTICA**

Abstract. Search for balance between the adidactic and didactic components of *savoir* in didactic engineering. Didactic Engineering describes in detail the stages of *connaissances* construction within *adidactic situations*, yet it does not address the stages in which this *connaissances* becomes decontextualized and transformed into formal *savoir*. This imbalance between the adidactic and didactic components of *savoir* presents a challenge for teachers who aim to implement Didactic Engineering with regard to meaning as the connection between *connaissances* and *savoir*. In this theoretical essay, I will defend the hypothesis that institutionalization needs to be considered in the design and a priori analysis of Didactic Engineering.

**JEAN-PIERRE BOURGADE, CLEMENT DURRINGER LE LOGOS, ENTRE
PRODUCTION ET INSTITUTIONNALISATION, DANS LES MANUELS SCOLAIRES DE
MATHEMATIQUES**

Abstract. The logos, between production and institutionalization, in school mathematics textbooks. In this work, we propose to carry out a study of some school textbooks with the intention of finding clues as to the organization of study as envisaged by the profession. In particular, we will seek to establish that the knowledge of the skills studied is not always satisfactorily produced or, when it is, properly institutionalized. The study is based on tools derived from the anthropological theory of didactics.

**DERYA DIANA COSAN PRAXEOLOGICAL DIFFERENCES IN INSTITUTIONAL
TRANSITION: THE CASE OF SCHOOL ALGEBRA**

Abstract. The transition from lower secondary to upper secondary school is a challenging time for many students with algebra as a focal topic. In this paper, we present a new approach to this problem, based on the anthropological theory of the didactic, particularly on what we call

praxeological differences between two connected institutions. The methodology involves the construction of a praxeological reference model for school algebra based on documents such as textbooks and evaluation instruments, like national exams and screening tests, from these two institutions. To illustrate this approach, the Danish transition problem in algebra between the lower and upper secondary school is examined as a case study. The results obtained by the students from these evaluation instruments are also a part of the data, to focus on knowledge actually obtained. The results from this case indicate that praxeological difference is chiefly concentrated on rules for rewriting an algebraic model.

RAYMOND DUVAL FRANÇOIS PLUVINAGE ET L'IREM DE STRASBOURG : UNE AVENTURE ET UNE HISTOIRE COMMUNES

Abstract. François Pluvinage and the IREM of Strasbourg: a shared adventure and history. Since the first IREM, research on the teaching of Mathematics and on Teacher Training has had to face previously unknown challenges, and to cope with changes in educational systems: reorganization of curricula, development of IT tools and software for calculation, algebra, geometry, diversification of professional pre-orientations, etc. Member of IREM of Strasbourg since its creation, Francois Pluvinage was for fifty years a major player in the Research and Training activities that were developed there. We distinguish seven periods in his commitments and papers: writing textbooks, national assessments, the development of algorithms to model school exercises and determine their complexity, the D.E.A. and the theses in didactics, the *Annales de didactique et de sciences cognitives*, and the dialogue between the teacher and the students.