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ABSTRACTS

**MAHA ABOUD, CECILE DE HOSSON. LES DIDACTIQUES DES
DISCIPLINES SCIENTIFIQUES : SE RENCONTRER, DIALOGUER ET
CHEMINER ENSEMBLE**

Abstract. The Didactics of Scientific Disciplines: Meeting, Dialoguing, and Treading a Path Together. In this introductory paper to the special issue of the "Annals of Didactics and Cognitive Sciences," we provide an account of the lectures delivered during the "Rendez-vous en Didactique" conference held in Paris from May 30 to June 3, 2022. The beginning of the paper revisits the conference's rationale and the request made to the invited speakers, framed within the perspective of dialogue among didactics from various scientific disciplines. Subsequently, we present some reference points to delimit and differentiate the so-called inter, trans, and multidisciplinary approaches. This clarification allows us to position the approaches of the lecturers in response to the conference organizers' request. A brief presentation of their contributions reflects the diversity of the adopted approaches. We conclude this paper by raising questions about these approaches and discussing the significance of this "unique" scholarly output, in which researchers from multiple fields have made an effort to understand each other, engage in dialogue, and endeavor to propose common perspectives for their respective communities.

**KARINE BECU-ROBINAULT, LUIS RADFORD. APPROCHES
SEMIOTIQUES ET LANGAGIERES EN PHYSIQUE ET EN
MATHEMATIQUES**

Abstract. Semiotic and linguistic approaches to physics and mathematics. In physics and mathematics, there is a growing interest in studying the meanings that teachers and students construct through the mobilization of several semiotic systems, including embodied action, such as gestures, body postures, rhythm and speech. In this article, we propose a comparison of two approaches, developed in parallel in each of these disciplines. In physics, it is the function of models in the scientific community of physicists that guides the consideration of semiotic systems to account for the reciprocal meaning of material situations and taught concepts. In mathematics, it is the very nature of activity - considered at the same time as ideal, material and sensible - which leads to a consideration of the semiotic systems which

underlie it, a consideration which allows us to shed new light on the processes of teaching and learning

CHRISTINE VERGNOLLE MAINAR, CATHERINE BRUGUIERE.
CONCEPTION ET USAGES DE RESSOURCES DIDACTIQUES : DES
RESSOURCES DISCIPLINAIRES CLASSIQUES A DES
RESSOURCES A-DISCIPLINAIRES A CONSTRUIRE

Abstract. Design and use of educational resources: from classic disciplinary... to a- disciplinary resources to build. Resources for teaching biology, geology and geography are questioned using innovative approaches supported by collaborative research. The interest of resources not referenced to a discipline is highlighted, into a perspective of disciplinary didactics, an interdisciplinary approach and the training of students as future citizens. This use of a-disciplinary resources is an issue for teacher training.

VALERIE MUNIER ET JEROME PROULX. DE LA SPÉCIFICITÉ DES
DISCIPLINES AUX PRATIQUES ENSEIGNANTES ET À LA
FORMATION : QUELQUES RÉFLEXIONS POUR LES
MATHÉMATIQUES ET LES SCIENCES

Abstract. From content specificity to teaching practices and teacher education: thoughts about mathematics and sciences. This article addresses questions relative to teachers of mathematics and sciences. We first establish the notion of the specificity of both disciplines as an epistemological background to underpin our ways of tackling questions about teachers' practices, knowledge and training initiatives. Addressing issues about practices (of teachers and of teacher education) in relation to each disciplines' specificity invites taking into account the nature of scientific and mathematical activity in itself. These orientations lead to consider the possibilities, in contrast to prescriptions, for addressing issues of teachers' knowledge and practices, and their implications for teacher education practices.

PIERRE JOB, FLORENCE LE HEBEL, MAGGY SCHNEIDER. DEUX
APPROCHES CONTRASTEES DE L'EVALUATION INTERNATIONALE
PISA

Abstract. Two Contrasting Approaches to the International PISA Assessment. This article addresses the theme of assessment through the prism of two different approaches to the international PISA assessment. The first approach focuses on the understanding and solving of PISA science items by students of different academic performance and socio- economic and cultural levels in the context of France. In the second approach, PISA is used to expose how mathematics didactics, essentially

equipped by the theory of didactic situations and the anthropological theory of didactics, allows to question the notion of evaluation considered as a process and is situated in the context of French-speaking Belgium. The discussion is structured around three points: the epistemological depth of the assessment process, assessment as a tool for analysis and understanding in order to better deal with the heterogeneity of learners, and the place of teachers within the assessment process.

JEAN-MARIE BOILEVIN, CHRISTIAN ORANGE. ENTRE RECHERCHES EN DIDACTIQUE ET ENSEIGNEMENT/FORMATION : TRANSPOSITION OU ENRICHISSEMENT MUTUEL ?

Abstract. Between research in didactics and teaching/training: transposition or mutual enrichment? How can we think about the relationship between didactic research and the development of the teaching profession? If the simplistic idea of application, too often retained by decision-makers, is not appropriate, the concept of transposition does not seem relevant either. We propose here a discussion of these relationships from two points of view, each based on a researcher's and trainer's experience. We thus highlight the indispensable diversity of collaborative work between teachers and researchers, corresponding to different research questions and questions arising from practice.

ÉRIC BRUILLARD, PHILIPPE R. RICHARD. INFORMATIQUE, MATHÉMATIQUES, CONCEPTION ET USAGE DES TECHNOLOGIES NUMÉRIQUES

Abstract. Informatics, mathematics, design and use of digital technologies.

This article touches up the complementary presentations provided by the authors during the conference, addressing the design, evolution, and utilization of digital technologies in education. It is composed of two distinct parts. The first one offers a perspective from the field of educational sciences, while the second focuses on the didactics of mathematics.

STEPHANIE BRIDOUX, NICOLAS GRENIER-BOLEY, NATHALIE LEBRUN. PRATIQUES *IN SITU* D'ENSEIGNANTS-CHERCHEURS ET CONFRONTATION AVEC LE VECU DES ETUDIANTS : UNE ETUDE DE CAS EN MATHÉMATIQUES ET EN PHYSIQUE

Abstract. *In situ* practices of teachers-researchers and confrontation with students' experiences: a case study in mathematics and physics. This research focuses on the teaching practices of teacher-researchers (TRs) in a lecture context. Their declared practices were studied using the sociological notion of professional identity. The analysis of the verbatim, collected during interviews with 5 TRs indicates

a strong attachment to the epistemology of their discipline and a willingness to interact with the student audience to facilitate learning. However, the analysis of students' answers to a questionnaire proposed at the end of the lecture shows a misunderstanding between their intentions and the students' experience. We have identified two profiles of TRs: some encourage interaction during the course by overlooking some of the students' difficulties, while others give too many details or use a medium that hinders learning.

MAHA ABBOUD, ASSIA NECHACHE, EMMANUEL ROLLINDE.
**L'ASTRONOMIE DANS LA FORMATION DES ENSEIGNANTS DU
PREMIER DEGRE : UN CONTEXTE INTERDISCIPLINAIRE POUR
FAVORISER LES ENSEIGNEMENTS EN MATHEMATIQUES ET EN
SCIENCES**

Abstract. Astronomy in primary teacher training: an interdisciplinary context to foster mathematics and science education. We examine how to foster a better appreciation of mathematics and science among trainee school teachers in order to improve their engagement in the teaching of scientific disciplines. To this effect, we adopt an approach based on the “polyvalence” of the school teacher. Through a training program based on interdisciplinarity between mathematics and sciences, in the context of astronomy, we study the related professional development in the pathways of two groups of trainee teachers. These two case studies show the importance of mastering scientific knowledge in the implementation of a “polyvalence” that allows two disciplines to enrich each other without excluding each other. This constraint often implies focusing the trainer's intervention on disciplinary knowledge more than on pedagogical and curricular knowledge.