

STUDENTS' PERSONAL WORK :A CASE STUDY: “LES CLASSES PREPARATOIRES AUX ECOLES DE COMMERCE”

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This poster presents the skeleton of an ongoing research study pertaining to students' personal work in the learning of mathematics at an undergraduate level. It presents the tools used to explore students' personal work, and focuses on the main results found through the analysis of the data collected for students enrolled in three different tracks of business school preparatory classes (CPGE).

Keywords: mathematics learning, student personal work, CPGE

DESCRIPTION OF POSTER CONTENT

Section 1- Research Background

The study targets students enrolled in specific French higher-education institutions (*classes préparatoires aux grandes écoles de commerce* - CPGE). It focuses on the development of students of these institutions over one year, with regard to their acquired knowledge and methods, as well as the factors influencing this learning process.

Section 2- Research Questions and Rationale

- What are the forms of study expected by the teachers, and what are the study gestures exhibited by “successful” students on their own initiative, in addition to those that are taught, as opposed to those who fail?
- How does the personal work of the students evolve throughout a preparatory year, in terms of quantity, modalities, and acquired knowledge and methods? What factors influence this learning process?
- What is the impact of the institutional context on the personal work of students? What is the impact of social relationships on student work, in particular the relationships that are built between the students and those with the teachers?

We attempt to answer the above questions while focusing on two main aspects of the students' activities: problem solving and studying math lessons. We hope that this would help us understand how the work that is carried out, or not, by the students contributes to the difficulties which they face. The institutional context plays a major role in this study, hence the choice of the CPGE. These institutions are known for their selectivity and supportive culture, which favours student collaboration and close follow-up by teachers, in a relatively rigid high-school-like system. In fact, students enrolled in these institutions seem to be achieving better results than those in regular universities, where failure during the first years seems to be a serious widespread

problem particularly in France. These institutions are viewed both in terms of the constraints they weigh on students and the resources they offer them, hence they constitute a rich and interesting field of study and observation.

Section 3- Theoretical Framework

The theoretical background is still in the process of elaboration. This study comes as a continuation of the work of Castela (2004, 2008, 2009) on this topic. Hence, inevitably certain elements of the Anthropological Theory of the Didactic are used to consider the institutional dimension and describe the conditions and constraints of the processes of mathematical knowledge creation, teaching and learning in didactic contexts. The notion of praxeological organization (Chevallard, 1999) is at the heart of analyzing the activities of students, who are subjects of these particular institutions, which imposes on them ways of doing and thinking. It will be used in the sense developed by Castela to account for the knowledge which is necessary for mathematics learning. Moreover, there is an emphasis on the idea that this type of knowledge is not taught, it is rather constructed by the students themselves. As for the cognitive dimension, other more psycho-social frameworks, yet to be defined, will be used.

Section 4- Data Collection

The study uses a combination of quantitative and qualitative methods which allow close follow up of several volunteer students throughout the year. So far, extensive data has been collected about teachers' practices and expectations, and student work habits, through several informal discussions as well as classroom observations. In addition, three questionnaires have been designed, pilot-tested and filled out by the students of three different branches (S scientific, ES economics and sociology and STG management sciences and technologies) from four business schools involved in the study. They all include similar items organized into six categories, which were inspired from prior research and are in accordance with the theoretical framework (general work habits, inside the classroom, taking notes, studying the lesson, solving exercises, evaluation of work and results), but contrast two moments of mathematics learning during a student's path: end of high school and end of first year of a preparatory class. The poster will exhibit some important items of these questionnaires. The next phase of the study which starts in February 2013 is more clinical, it includes interviews with several volunteer students and extensive email communication, as well as videotapes of student group work sessions.

Section 5- Main Results (until end of January 2013)

The focus is on the data collected from the questionnaires, which was coded and analyzed using SPSS. The main objective is to compare the results of the questionnaires in order to identify common ways of student work, and how these evolve throughout this first year of preparatory classes, in the particular context of these institutions.

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