

UNIVERSITY STUDENTS' SELF-EFFICACY BELIEFS CHANGES DURING FIRST-YEAR COURSES: A PRELIMINARY ANALYSIS

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MOTIVATION AND CONTEXT

In the current post-pandemic situation, transition to university, for students coming from one to two years of distance learning, seems particularly worth consideration. Teachers' informal observation during first-year university courses, confirmed by students' achievement in exams, seem to suggest a portion of average-scoring students is struggling more than before. Our research aims in general to analyse the difficulties encountered during the first year of university and, more in details here, the role of self-perception of mathematical ability in students. Also, is there a relationship between students' self-efficacy beliefs entering university after secondary school studies and effective students' achievement in first year exams? Does this self-perception change in the first months of university?

LITERATURE

In psychological literature, academic self-perception has been long studied (Bem, 1972), also from a mathematics education perspective (Hannula et al., 2016). It has been documented that there can be a weak correlation between perceived performance and the one then assessed by teachers (i.e., exam results – e.g., Chemers et al., 2001). Self-efficacy beliefs are considered following Chemers et al.' interpretation (2001). Students generally over-estimate their own ability (Falchikov & Boud, 1989). On the other hand, academic self-efficacy has been found to influence students' persistence, self-regulated strategies, and effort in mathematics, and to be correlated with persistence (Hannula et al., 2016).

RESEARCH AND METHOD

Two long questionnaires were distributed among students: one in October, during the first week of the courses, and one in February, after the first two exam sessions. Students involved are enrolled in university in mathematics, physics or engineering. In this analysis, only students who filled in both questionnaires were considered. A couple questions of both questionnaires asked students to evaluate their general attitude and self-perception towards their path of studies (e.g., “evaluate the following sentence: I am convinced that I will achieve my goals in the chosen university path”). To avoid considering students whose motivation drastically changed, we choose to analyse here answers of students who did not change their self-evaluation about the above by more than one point (out of a 5-point Likert scale). Our final observation group consists of

144 first-year students. The sections of the questionnaires we are interested in, for the purpose of this presentation, were about students' self-efficacy beliefs and usual behaviours during study time.

OBSERVATION AND RESULTS

Some preliminary facts about some of the questions are worth noticing. While there is a correlation between self-efficacy beliefs and exam results, there seems to be a self-perception change during the first semester. Self-evaluation about the students' general preparation in mathematics went from 3.12 out of 4 to 2.55 out of 4 (same question in pre- and post-course data collection, in a 4-point Likert scale). Another related question was to self assess the following: "I happen to think that I have understood a topic but then discover (at exams, ...) that it is not so" where the after-secondary-school answer was averaging at 2.21 while the after-the-first-semester answer arrived at an average of 2.57, in a 4-point Likert scale. In a direct question about the relation between expected and obtained results in the final Calculus exam, 47% of the students admit they were expecting a higher grade and, in a final question regarding obstacles encountered during the course, 32.9% point out that their initial preparation was not sufficient to properly face the course demands. There is also evidence of behavioral changes from the intended method (declared in the October questionnaire) and the review questionnaire, such as a need to implement new study methods, to quit "last minute" studying, to discuss more with peers and tutors and to rely on the teachers' availability. Some first conclusions tell us that, even though not discouraged in going on with their STEM studies, students are faced in this first semester with more challenges than they expected and, during the semester, gain some deeper insight into self-evaluation and what is expected from them and intend to change some behaviors to better adapt to the new education level. Further research is expected in this direction, together with some proposal of activities to alleviate these obstacles and facilitate students' transition to university, which we are working on in the present.

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