

Investigating the relationships between gender stereotypes, disciplinary identity and academic performance

Monday, December 13, 2021 4:40 PM (20 minutes)

Abstract. The Gender stereotypes, Disciplinary Identity and academic performance (GEDI) will be presented. This project aims to analyse the role of gender stereotypes in conditioning the construction of disciplinary identity, i.e. the ability to identify oneself with the discipline and to have science career aspirations in the same area, of STEM students.

1. The GEDI Project's Objectives

The role that society attributes to people, on the basis of their gender characteristics, affects their personal life, educational choices and work experience. This mechanism often limits personal and professional fulfilment, especially for women, and it can be due to a multiplicity of social, cultural, economic, educational and institutional factors. Although the scientific literature has long shown that men and women possess quite similar skills, methods and general approach to problem solving [1-2], some areas of study and work are absolutely male dominated, with a greater presence of women in areas with lower employment, career and income prospects [3]. The gender gap is particularly harsh in STEM (Science, Technology, Engineering and Mathematics) fields, and is fuelled by a complex set of gender stereotypes that affect women's interest, self-efficacy and, in turn, their educational and professional choices [4]. To better investigate gender gap in STEM, the GEDI project aims at validating a structural model of disciplinary identity, including gender stereotypes as precursors and psychological and metacognitive variables –interest, sense of belonging, perceived utility, confidence and self-efficacy –as relevant mediators, which in turn can also influence persistence in choosing a career in STEM. The specific objectives will be: (i) to explore a possible relationship between gender stereotypes and interest, confidence, sense of belonging, perceived utility, self-efficacy and disciplinary identity in students enrolled in the first year of university; (ii) to explore the complex relationship between the variables studied and academic outcomes; (iii) to monitor the evolution of these relationships over academic years.

2. Sample and methods

To answer our research questions, about 1000 students attending different undergraduate STEM courses will be involved. To study the evolution of disciplinary identity, students from three university cohorts will be involved: first, second and third year. In addition, non-STEM students will also be involved to investigate differences due to gender stereotypes. The instruments used for this study will consist of a battery of instruments: (i) personal data survey (age, gender, geographical origin, political and religious orientation, type of diploma, socio-cultural capital); (ii) Ambivalent Sexism Inventory and Male Role Norm Scale; (iii) interest, perceived utility value of the course of study, sense of belonging, confidence and disciplinary identity; (iv) perceived self-efficacy in the discipline. University performance will be assessed using the obtained ECTS. The measurement model will be tested using confirmative factor analysis (CFA). To assess the differences between female students and male students and between different students' groups (STEM and non-STEM), a multi-group structural analysis will be carried out.

3. Expected results and dissemination

The theoretical framework that will be validated in this project will not only contribute to the current knowledge of the construct of disciplinary identity in STEM, identifying significant precursors and mediators, but will also improve the current knowledge of the relationship between disciplinary identity, performance and academic persistence in STEM. Based on the expected results, it will be possible to develop interventions aimed at promoting STEM education and more gender-inclusive STEM careers in secondary schools and universities, in particular by addressing the role of gender stereotypes in order to build a more autonomous and conscious disciplinary identity.

4. References

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[4] M.T. Wang and J.Degol, Motivational pathways to STEM career choices: Using expectancy–value perspective to understand individual and gender differences in STEM fields. *Dev Rev* 33 (2013),304–340.

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Session Classification: Parallel 2 - Wroclaw/Guayaquil

Track Classification: 15. Nature of Science, gender and socio-cultural issues in physics education