Fairness In Teaching

How to support fair education to increase the representation of girls in STEM*

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ABSTRACT

The Fairness In Teaching (FIT) project aims to improve fair teaching practices, especially in STEM disciplines, thereby providing equal opportunities and access to STEM across a diverse range of pupils (boys and girls, the less-privileged, etc.). FIT provides primary and secondary school teachers with an intersectional competency framework (2) and tools they can use to help them understand how to make their teaching fairer in everyday practices. These tools are Situational Judgment Test (SJT) (3) to assess how fair teaching practices are, an online 'digital assistant' as a system for recommending teaching materials tailored to assessment results (4) and a training for teachers to raise their awareness of biases and stereotypes in STEM education and to improve their fair teaching practices (5). Following a design thinking process, FIT collaboratively involves its target groups in a Community of Practice (the FIT CoP) (6) that engages them as 'agents of change' to increase the impact of the project.

CCS CONCEPTS

• Social and professional topics • User characteristics

KEYWORDS

Fairness, STEM education, gender, intersectionality, competency framework, situational judgment test, digital assistant, training, community of practice

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[1] FIT is coordinated by Luxembourg Institute of Science and Technology (LU) and gathers four other partners: Frederick University (CY), Smart Venice (IT), Rector of the Academy Nancy-Metz (FR) and WIDE andco (LU).

1 Introduction

At school, persistent gender stereotypes relating to girls and science keep preventing girls from choosing STEM studies, and consequently from pursuing STEM careers. Fairness in teaching has become a real competence to be developed in school education and needs to be accompanied by an advanced approach. Between 2021 and 2024, the project Fairness In Teaching (FIT)[1] has aimed at developing an advanced approach to stepping up fair teaching practices especially in STEM disciplines. Built on the former Gender4STEM project it develops an intersectional competency framework of fairness in teaching (2) and its associated Situational Judgment Test (SJT) (3), a 'digital assistant' platform (4), a training for teachers (5) and animates a FIT Community of Practice (CoP) (6).

2 The FIT competency framework

Originating in the context and practice of US legal activism in the early 1990s, intersectionality enters the language of institutions and international law as a tool for reading the discriminatory phenomenon within the promotion of human rights [1]. It embraces a holistic conception of the human person and leads to the emergence of a plural and inclusive vision of anti-discrimination protection [2]. For the FIT project, adopting an intersectional approach implies that in promoting fair teaching, we not only pay attention to gender discriminations, but also to other factors like ethnicity, disability, sexual orientation and gender identity, social class, etc. and we consider them as intertwined and mutually constitutive, rather than isolated and distinct [3]. We build the FIT competency framework identifying necessary knowledge, skills, and attitudes [4] to better counter multiple forms of discrimination in the classroom and as part of the different teaching activities: preparation, teaching, assessment, counseling and raising awareness [5, 6]. In educational contexts, it means that we recognize stereotypes and inequalities related to gender, race, sexual orientation, disability, social class, and their intersections and/or

cumulative effects in school environments, in order to improve communication and collaboration in the classroom [7].

3   The FIT Situational Judgement Test

One milestone of the FIT project is the definition of a Situational Judgment Test (SJT) to assess the stepping up of fair competencies in teaching, connected to the FIT competency framework. Some teachers will fail some questions of the SJT, some will succeed, whatever the way they self-assess themselves. SJTs present test takers with realistic, hypothetical situations or scenarios and asks them to identify the most appropriate response or rank the responses in the order they feel is most suitable. An SJT is a collection of objective questions with 'true' (desirable) and 'false' (non-desirable) answers [8]. It is assumed that SJTs measure the participants' procedural context-specific knowledge and situational decision-making ability [9]. The situations to be used for the FIT SJT are selected thanks to the contribution of around 50 teachers through dedicated workshops, ensuring that all the key dimensions of the FIT competency framework are covered. Situations are elicited to refer to episodes where STEM teaching addressed girls with different class, race, religious backgrounds, gender identities and sexual orientation so as to operationalize the above-mentioned intersectional approach.

4   The FIT digital assistant

The FIT 'digital assistant' is freely available on an online platform (https://www.fairnessinteaching-project.eu/). It includes the SJT, so that teachers can take stock of their own fair teaching practices. Depending on the results of the SJTs, the 'digital assistant' recommends teaching materials that teachers can experiment into classrooms. The recommender core is based on a graph-based semantic recommender system with references to the teaching materials representing the recommendable items [10]. They are organized by teaching activity, language, and type of material (guidelines, video, soundtrack, quiz, MOOC…).

5   The FIT training for teachers

The FIT training package has been designed applying feminist pedagogy principles [11] and standards [12]. It is structured in two hands on sessions' training of four hours each. It aims at: 1) raising awareness on discriminations related to sex, gender, age, ethnic origin, religion, beliefs, sexual orientation and disability, 2) training teachers in intersectional pedagogy, 3) reflecting on the situations in which stereotypes and biases are enacted in the classroom, even unintentionally, and generating knowledge in this area through mutual learning, and 4) providing methods and tools that teachers can experiment so to foster more fairness in STEM teaching.

6   The FIT Community of Practice (CoP)

A Community of Practice (CoP) is a group of people who "share a concern or a passion for something they do and learn how to do it better as they interact regularly" [13]. In a CoP the participants are active practitioners, and their purpose is to share tips, best practices, ask their colleagues questions, and support each other. The FIT CoP consists of primary and secondary school teachers, practitioners of gender equality, training organizations, Governmental stakeholders and NGOs representatives. The members of FIT CoP are coming from Luxembourg, Cyprus, Italy, and France. The members have mutual benefits as they share their experiences, their knowledge, and ideas, they disseminate the results of the FIT project in their network, and social media, they participate in the creation of new teaching materials promoting equity in teaching and participate in the events of the project in training and/or webinars as ambassadors. In addition, members test the proposed tools, and the 'digital assistant', provide feedback on teaching materials and training, and make suggestions for improvement.

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