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## **When IT female students become teachers: lessons from a French project “Girls who code” as a learning by doing example.**

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Research in education has shown disaffection among women and girls with Science, Technology, Engineering and Mathematics areas, especially in Computer Science. Until 1990's, the feminization of IT engineering job was important. Unfortunately, the development of IT employment benefited largely to men beyond 1990's. Sax et al (2017) performed a US nation-wide survey on the selection of computer science majors during the past four decades. Authors highlight a significant downturn between the late 1990s and 2011 as well as a persistent, sizeable underrepresentation of women throughout this period. This process seems persistent as it affects IT higher education, the proportion of women among students decrease during the same period of time. The representations of computer and IT engineers is a key component to understand this disaffection. Public authorities attempt to address this disequilibrium: communication dedicated to girls in secondary schools, introduction of programming into the curriculum for elementary and secondary schools. In such a context, our research intends to better understand how the curricula could influence or not female pupils to take in consideration IT or coding as a “possible” and interesting discipline.

Among the different dimensions in a curricula, our research is interested in the educators. Previous research highlights that female role models can buffer women's math test performance from the debilitating of certain situational factors. We then postulate that appropriate role models can counterbalance gender stereotypes towards STEM areas.

Our investigation is based on the “Girls who code”. It is an educational device to foster the practice of sciences in general, and programming in particular. Some female undergraduate and graduate students act as teachers for elementary schools. To date, the project has been delivered in 26 classes in Brest (France), which represents 491 pupils from 6 to 11 years old, and 25 female science students. During five lessons, female students teach the Scratch programming language, which allows pupils to create their own interactive media, such as animations, games, and stories.

Our methodology is based on semi structured interviews which were conducted with female students who teach in these classes and with teacher who are in charge of those classes. We supplemented the interviews with observations led in some classes, such observations give access to interactions between pupils and female students, and between pupils of both genders. An analysis was then conducted following an iterative process of data coding, categorization and abstraction. Our results highlight how the educational device is appropriate by the actors in order to fulfill some professional goals. Those goals which may match or not with those of the device. Finally, it will help to explore how such a device could be expanded in future.