Inclusive gaming creation by design in formal learning environments: "girly-girls" user group in No One Left Behind

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Coupled with the fact that a new generation of youngsters that has never known a world without the internet, social media, and mobile technology (technologically-native children born in the digital era -Generation Z -) is increasing and growing, some alarming statistics related with young people at risk of exclusion and dropping schools remain high. More than one child in four in Europe is at risk social exclusion[1] while six million young people drop out of school each year[2]. As a reaction, there is an extreme pressure on schools to produce outcomes with an imminent need for social innovation. Hence, the use of Digital Games[3] as part of the formal academic curricula comes as a natural response.

Under this context, the European Commission co-funded project "No One Left Behind" aims at unlocking inclusive gaming creation and experiences in formal learning, underpinning meaningful learning and supporting children to realise their full potential. To achieve these purposes the project will develop a new generation of Pocket Code software.

Pocket Code is a mobile visual programming system for smartphones and tablets and is developed by the free and open source project Catrobat[4]. It allows users, starting from the age of eight, to develop games and animations directly on their smartphones and/or tablets. Pocket Code's aim is to enable children and teenagers to creatively develop and share their own software.

The new generation of Pocket Code will integrate, on one hand, an innovative set of game mechanics, dynamics, assets and in-game analytics from non-leisure digital games, and on the other hand, the projects and objectives of the current academic curricula of different primary and secondary grades of piloting schools. Altogether, the project involves three pilot sites in Europe (Austria, UK and Spain) targeting 600 children/students aged 8-17 years. Each pilot site (country) will respectively approach the following inclusion challenges: gender, disabilities and immigration.

"*No One Left Behind" pilot in Austria: gender exclusion in teenagers.*

Promoting gender equality has long been on the policy agenda in all European countries, however gender-based discrimination still poses barriers in several areas. For example women are overwhelmingly underrepresented in STEM related fields.

Easter Europe has the highest number of women in Europe enrolled in STEM degrees, and only 8.13% enrol in those degrees[5]. In Canada, a study about career's interest[6] showed that the lack of interest on the part of the women drove the percentage of people indicating that they were interested or very interested in "High Tech/Computers" down to 20%. Similarly, the 2005 Taulbee survey[7] found that 84.9% of bachelor's degrees in the U.S. in computer science were awarded to men.

While younger girls up to the age of 12 do not yet show significant disinterest in topics related to computational thinking, a number of studies as well as day-to-day informal evidence show that the majority of teenage girls rapidly drop out of IT related courses during high school. Kelleher et al.[8] report that many girls decide whether or not to seriously pursue the study of math and science based disciplines during their middle school years.

In order to address this gender bias, in "No One Left Behind" we are evaluating how Pocket Code can become as attractive as possible to different female teenager user groups. Not all female teenager groups of potential users have the same interests or demographic characteristics, but some groups such as the so-called "girly-girls" group are particularly interesting as these girls, on the one hand, constitute a large percentage of all female teenagers, and on the other hand, members of these groups are often the least interested in creating their own programs even though they constitute large groups of passive smartphone and tablet users. Turning them from mere consumers to active creators is a challenging task for this project. The project will experiment with various versions of Pocket Code that optimize the design, usability and user experience for girls by, e.g., offering attractive and appropriate sample content, media assets that can be reused in one's own programs or a special view on what programs have been uploaded to the sharing website.

In a couple of years we expect that "No One Left Behind" could provide a set of Pocket Code pre-programed template modules that allow teachers bridging unequal access to game based academic experiences.

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